IMPACT OF FOREIGN TRADE ON THE ECONOMIC GROWTH OF PAKISTAN: A DISAGGREGATED ANALYSIS

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March 2017

Foreign trade

International economic relations.

Breusch-Pagan-Godfrey test


بسم الله الرحمن الرحيم

APPROVAL SHEET

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Declaration

I, **Mohammad Rafiq**, MS Economics Degree Program vide Registration 326-SE/MS-ECO-2/F13, hereby declare that this dissertation is original and has never been presented in any other institution. I, moreover, declare that any secondary information used in this dissertation has been duly acknowledged. I, have also incorporated all the changes suggested by the supervisor, internal examiner and external examiner.

Mohammad Rafiq

DEDICATED TO MY GREAT AND LOVING PARENTS WHO'S LOVE, PRAYERS AND SACRIFICES MADE ME ABLE TO REACH THIS LEVEL

ACKNOWLEDGEMENT

It is ALLAH (SWT) who helps me in all respects of life and gets solved my problems especially regarding studies with unbelievable sources, so I am thankful to Almighty ALLAH and thereafter to his creature. I pray for peace and blessings on all His noble messengers, especially on the last prophet Muhammad (PBUH).

First and foremost I would like to thank who deserves, to be prayed and praised, Dr. Hafiz Muhammad Yasin my supervisor. His comments, critiques and ability to detect errors while going through the various drafts, made this work what it is to date.

It is pleasure and honor to express my sincere thanks to Dr. Atiq-uz-Zafar (Director IIIE) who provided me extensive support and guided me whenever I visited him.

I am extremely grateful to my co-supervisor Dr. Abdul Rashid for his extraordinary help during estimation and thesis writing. I would like to thank Dr. Arshad Ali Bahtti (Chairman Department of Economics) who provided me extensive support.

I express my gratitude and profound admiration to my affectionate and beloved sister and brothers for their moral support love and care throughout my life. No words exist in the world to pay tribute to my "*SWEET PARENTS*" for giving tons of love, prayers, pursuit for higher ideas of life and confidence to face the ups and downs of my life.

I am also thankful to all my teachers and friends who helped me whenever I needed.

God Bless them All!

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Abstract

This study examines the impact of both aggregated and disaggregated foreign trade on the economic growth of Pakistan. The empirical analysis is conducted by using time series data from 1970-2014.The augmented Dickey-Fuller and Phillips-Perron tests are employed to ensure stationarity of data. The estimation strategy is based on four approaches. First, we employ the Johansen Cointegration test, which is followed by the dynamic least square, auto regressive distributed lag (ARDL) bounds test to get robust, consistent and unbiased estimates. In addition, we have employed Breusch-Godfrey LM test for detecting serial correlation and Breusch-Pagan-Godfrey test for heteroskedasticity. For the stability of the model, we have employed CUSUM and CUSUM of Square test.

Our results show that exports have a positive impact on the economic growth of Pakistan, while imports adversely affect economic growth. Consequently, the export-led growth hypothesis is still valid. In other words, the import-led growth hypothesis is not valid in Pakistan. The results also show that physical capital, human capital, manufactured exports and primary exports have positive but highly significant impact on economic growth. However, the impact of manufactured exports is larger than primary exports. In contrast capital goods imports have a negative impact on economic growth, possibly due to poor absorptive capacity. Similarly, semi processed exports and consumer goods imports have a positive but insignificant impact on economic growth. The study recommends more concentration on the export sector so as to improve its performance and decrease the trade deficit of Pakistan.

Chapter 1

Introduction

Economic growth is the mainstay of an economy as it plays the central role in the social uplift of the people. However, the question arises as to what might be the appropriate way through which economic growth can be accomplished rapidly. A large number of factors are responsible for the economic growth of a country; for instance, physical and human capital, labor force, investment in the infrastructure and foreign trade etc. The nexus between foreign trade and economic growth has been discussed by social philosophers since the nineteenth century. Trade is considered to be the prime factor in the progression of an economy. The existing literature underlines two main streams through which foreign trade can affect economic growth. First is the impact of aggregate foreign trade (exports plus imports), and second is the impact of disaggregated foreign trade on economic growth (primary, semi processed and manufactured exports on the one hand, and imports of consumer goods as well as capital goods on the other, the later bring modern technology forthwith).

1.1 Background of the Study

The literature highlighting aggregate foreign trade as the determinant of economic growth is capacious. For instance, Didier (2013) empirically evaluates the different channels of growth. He considers the trade as a forceful link among an economy and its key partners and the 'world growth poles'. His results advocate two features of trading associations to be predominantly important; firstly, which industries are involved, and secondly, how the exported and imported goods are produced, i.e. technology. Moreover, a progressive

spillover effect of trade on economic growth is perceived; as the volume of trade in the similar industries increases, the performance of export sector flourishes, which leads to strengthen the human capital implanted in the merchandise. However, the types of goods being traded, whether primary commodities or high-tech goods, do not matter in enlightening what lies behind the nexus between foreign trade and growth. In addition, there is a strong indication of the significance of trade relationships with one of the 'world growth poles', particularly when it is a developed country.

Grossman & Helpman (1991) have point out that trade expands the available variety of capital equipment and intermediate goods, which can enhance the productivity of other resources in the country. Foreign trade helps developing countries in acquaintance to enriched technology of developed countries. Trade allows intensify capacity utilization that not only increases the volume (quantity) but also improves the quality of producer and consumer goods. Openness to trade provides a vast market for local firms, permitting them to work at the essential scale, and to secure the benefits of increasing returns to scale.

The export-led growth hypothesis indicates that the exports expansion strategy is very important for stimulating economic growth in the long-run. For instance, Oskooee et al. (2005), Balassa (1985) and Szkorupova (2014) explore the impact of exports on growth and their findings are strongly in favor of the above hypothesis (ELG). However, the literature on the impacts of disaggregated foreign trade is segmented. Most of the studies investigate the separate impact of manufactured and primary goods exports, and that of capital goods and consumer goods imports on economic growth. Examples of these studies are Nouira et al (2011), Iwanow and Kirkpatrick (2008), Sahoo and Dash (2014) and Chambers and Gordon (1966). On the other hand, very few studies are available which

investigate the combined impact of PR exports, MN exports & capital goods imports on EG. See, for instance, Sheridan (2014) and Herzer (2006).

There is a vast literature on the export and growth nexus; however the literature on the imports-growth relation is very scanty. In some studies, the influence of imports on economic growth is shown to be negative. For instance, Tahir et al., (2015) argues that foreign imports have a significant adverse impact on growth. Likewise, Mazol (2016) investigates the impact of intermediate and (CPImp) capital goods on GDP growth for Belarus and intimates that the imports of these goods negatively contribute to economic growth. In contrast, Herrerias and Orts (2009) have found a positive and significant influence of imports on growth.

Keeping in view the above discussion, the studies on the impact of composition-wise (disaggregated) foreign trade on economic growth are very limited in general and for Pakistan in particular. Although some studies have explored the growth effects of export composition, but no comprehensive effort has been made to see the overall and isolated impacts of primary exports, semi processed exports, manufactured exports, consumer goods imports and capital goods imports on economic growth. As such, the present research intends to evaluate the nexus of aggregated and disaggregated exports and imports on the growth performance of Pakistan.

1.2 Research objective

The study is designed to accomplish the following objectives;

1. To examine the impact of aggregate foreign trade on economic growth.

2. To investigate the impact of disaggregated foreign trade on economic growth, that is:
   (a) To determine the relative importance of primary, semi processed and manufactured exports in determining economic growth.
   (b) To analyze the impact of imports of capital and consumer goods on economic growth.
3. To compare the impacts of aggregated and disaggregated exports and imports on economic growth and to see the relative importance of each segment.

In other words, the study will address the following research questions:

1. Is there any difference between aggregated and disaggregated foreign trade so for their impact on growth is concerned?
2. Which of the three sub-components of exports composition and two sub-components of imports composition is more beneficial for economic growth?
3. Which of the competing hypotheses, export-led growth & import-led growth is still valid?

In order to meet the objectives, the study will test the following five hypotheses:

1. Aggregate foreign trade has a positive impact on economic growth.
2. Disaggregated foreign trade has a positive impact on economic growth.
3. Manufactured exports are more significant than primary and semi processed exports.
4. Consumer goods imports are beneficial than the capital goods imports in Pakistan.
5. Export-led growth is valid for Pakistan.

1.3 Significance of the Study

This research is designed to investigate the relationship between foreign trade and economic growth for Pakistan, both at aggregate and disaggregate levels.

This study is different from others in the following dimensions:

1. Most of the studies as listed in the literature review, (Chapter 2) have examined the relationship concerning exports & growth. Moreover, many studies have considered the growth of total exports, while, it is more important to consider the level of exports rather than exports growth for attaining the positive externality properties. In addition, some studies have investigated the combined influence of exports and imports on economic growth. In contrast, this study considers the impact of aggregated and disaggregated foreign trade (both exports and imports) on the economic growth of Pakistan.
2. From the existing literature, exports are part of gross domestic products. As exports increase, gross domestic product will increase. However, the impacts of different components of export are different. In many developing countries primary exports are the driving factor of GDP growth while in some other countries, the, manufactured exports are to be more important for growth. In this study we decompose total exports into primary, semi processed and manufactured exports to show the separate effects of these variables on economic growth. Likewise, to find the separate impacts of imports, we decompose imports into consumer goods imports and capital goods imports.

3. Most of the studies on trade implicitly assume the same production technology and common economic structure across countries, which is the main drawback of cross section studies. To avoid this problem, we use time series techniques.
4. Physical capital, human capital, and labor force are the important variables which affect economic growth. We use the augmented form of the neoclassical endogenous growth model to incorporate these variables and employ the Johansen co-integration test, dynamic OLS and ARDL approaches to examine the co-integration among the variables.

1.4 Organization of the Study

After this introductory chapter, Chapter 2 discusses a general review of the literature. Chapter 3 provides the theoretical framework and Chapter 4 discusses the model, estimation techniques and the data nature and sources. Here, we discuss three empirical techniques to estimate the nexus between foreign trade and economic growth. Chapter 5 discusses the results and the final chapter is devoted for conclusions and policy recommendations.

Chapter 2

Literature Review

The main objective of this study is to explore the nexus between foreign trade and economic growth (both at aggregate and disaggregate levels) for Pakistan. The term 'disaggregated' implies exports of primary, semi processed and manufactured exports; and imports of consumer goods and capital goods) and we would like to see their individual impacts on economic growth. The theoretical bases of the literature concerning the relationship between foreign trade and economic growth are comparative and absolute advantage theories, as well as the models put forward by Hecksher-Ohlin and their followers. The empirical literature relating foreign trade to growth has been focusing on the pattern of foreign trade policies. A lot of studies have been conducted to investigate the impact of exports and imports on economic growth. Some studies have examined the nexus among capital goods imports, manufactured exports, primary exports and economic growth. This chapter is devoted to a brief narrative of important studies.

2.1 Studies on the Nexus between Aggregate Trade and Economic Growth

Foon et al. (2015) point out the presence of the long-run association between exports, exchange rate and GDP. The results demonstrate that there is a long-run positive correlation between exports and GDP. However, in a short period of time, they may deviate from the equilibrium state. The bivariate model estimated for the export-led growth gives mixed results. Specifically, there is bi-directional causality between export and GDP for Singapore and Hong Kong, however, there is uni-directional causality for Taiwan and South Korea, running from GDP to exports. However, the findings of tri-variate model

confirm bi-directional causality for all selected economies. It also shows the miss-specification of the bivariate model. Another significant finding, which shows that the export-driven growth strategy is unstable for all four countries.

Similarly, Oskooee et al. (1991) examine the relationship between exports and economic growth. The findings of their study support export-led growth hypothesis. In contrast, Jung and Marshall (1985) point out the causal relationship between exports & economic growth. They have concluded that the evidence in favor of export-led growth is weak, as compared to previous studies, which have found strong indication in favor of export promotion. However, Konya (2006) explores the prospect of causal relationship between the exports and real GDP. The outcomes of his study point out uni-directional causality running from real exports to real GDP in Belgium, Spain, Iceland, Denmark, Italy, Ireland, New Zealand, and Sweden, similarly, a uni-directional causality running from GDP to exports in Greece, Austria, Mexico, France, Japan, Portugal and Norway and bi-directional causality between exports and growth in Finland, the Netherlands and Canada, however, there is no causal relationship between exports & growth found for Korea, Luxembourg, Australia. In addition, in case of Switzerland, the USA and the UK, there is also no causal relationship between the variables. However, Hatemi (2002) investigates the causal association between exports and growth for Japan. The study finds that the Granger causality is bi-directional and export is an integral part of the economic growth process in Japan. Moreover, Szkorupova (2014) inspects the relationship among export, foreign-direct investment and economic growth in case of Slovakia. They conclude that impact of foreign-direct investment and export on gross domestic product is positive.

Mehmood (2013) has examined the causality between exports and growth. Further, he investigate that either export-led growth (ELG) or growth-led exports (GLE) hypotheses is valid for Pakistan. The results show the long-run association among the variables. Moreover, there is uni-directional relationship between GDP & exports to Organization for Economic Cooperation and Development (PETOECD). Furthermore, this study supports the ELG hypothesis. In addition, Siddiqui et al. (2008) reinvestigate the export led growth hypothesis in Pakistan. They have concluded that imports, exports, and trade liberalization have a positive effect on growth, however the terms of trade has a negative effect. Furthermore, the (ELG) hypothesis is supported for both the short-run as well as for the long-run. Economic growth in Pakistan is go along with by fluctuations in exports and imports both in the long & short-run, however in the short-run labor force participation rate has a negative effect. Moreover, Qudduss and Saeed (2005) have tested the validity of the (ELG) hypothesis in case of Pakistan. The test results show a positive uni-directional causality running from exports to growth in the long-run. The findings of the study also rejected the hypothesis of no co-integration between exports and GDP. Exports are Granger causing GDP growth. The results also reveal that growth of exports, labor force and investment have a positive and significant impact on growth in Pakistan.

In addition, Mehmood (2013) has analyzed (ELG) hypothesis. In addition, he investigate the growth-led exports hypotheses for Pakistan. The findings of Johansen's Co-integration test show the presence of long-run relations between exports & growth. Moreover, the findings also support export-led growth (ELG) & growth-led exports (GLE) hypotheses. However, Alam (2012) examines the legitimacy of export-driven growth hypothesis for Pakistan. His results show that there is a positive relationship between exports, imports and

economic growth. The short-run results of (ECM) are showing the influence of explanatory variables imports and exports on growth. The outcomes indicate that growth of GDP in 2006 has significant and positive influence upon both current period economic growth as well as the growth of 2005. However, exports of year 2005 and 2006 have negative effect on the current year GDP. The results also reveal that the impact of imports in 2006 is negative on the growth of GDP.

Pistoresi and Rinaaldi (2012) inspect the relationship among imports, exports, and economic growth in Italy .They have concluded that the variables are co-integrated in the long-run. However, the direction of causality between the variables are varying across time. Moreover, they have also found a weak support for export-led growth and growth-led imports. Furthermore, this study concludes that both exports and imports are the driver of economic growth. Moreover, Shihab and Khaliq (2014) examines the relationship between growth and exports in Jordan. They have found a uni-directional causation running from the economic growth to export, however exports do not Granger cause economic growth. On the basis of causality tests results, the variations in the economic growth enlighten the fluctuations, which affect the export. The findings also support the existence of causality between exports and economic growth in Jordan. However, the direction of causal relationship runs firmly from growth to exports. Consequently, this study supports the growth-led export in Jordan. Furthermore, Alam et al. (2014) examine the influence of exports on the economic growth in the manufacturing sector in Iran. Grounded on the research outcomes, they have found that the impact of exports on the growth of the industrial sector is positive and significant. Moreover, they argued that diversification of the industrial products is the key part of the economy.

Lawrence and Weinstein (1999) investigate the relationship between trade and growth. They find that worse tariffs and higher volumes of import are beneficial for Japan. Moreover, the results also indicate that larger imports of competing goods increase innovation. Furthermore, competitive pressures and potentially learning from external rivals are main channels for growth. However, Akbar and Naqvi (2000) have investigated the issue of export-growth nexus employing Granger causality test. The findings show that exports do not accelerate growth in any of the causality tests. However, in all the tests, growth leads exports. Moreover, they point out that there is no key role of imports in the export-growth association. In contrast, Sakka and Mutairii (2000) observe the casual relationship between export and economic growth in the Arab countries. They have found that generally there is no co-integrating nexus between exports and GDP. However, they have used the causality test and the results of these tests are mixed. Further, Ahmed (2013) has argued that both exports and imports are moderately related to the GDP growth in Bangladesh. However, export contributes positively to GDP, whereas, imports contribution is unenthusiastic.

Din (2004) investigate the export-led growth hypothesis in case of five major South Asian economies. His results indicate bi-directional relationship between exports & growth in Sri Lanka, Bangladesh and India, for the short period. The study finds long-run stable relationships among imports, exports, and growth for Pakistan and Bangladesh. However, for Sri Lanka, India and Nepal, no sign of a long-run relationship among the appropriate variables is found. In addition, these results are not support some earlier work that establish the export-driven growth hypothesis is a phenomenon, which exist for a long period of time in the region for all countries. Moreover, Shirazi & Manap (2004) examine the relationship

between exports and economic growth. The findings reveal a long-run association among the variables. Moreover, there is a feedback influence between output & imports. Though, exports cause output, but adverse is not true. Moreover, there is no substantial causal relationship between imports and exports.

In addition, Chaudhary and Qaisraani (2002) examine the starring role of trade instability in the growth process. The results reveal that export instability have no impact on investment and economic growth. Moreover, they find that massive foreign exchange reserves increase capital formation. Furthermore, too much foreign reserves positively affect output growth. In addition, they also find that instability in exports does not affect domestic investment and imports of capital goods. However, export instability negatively affect foreign exchange earnings, consequently, it could have adverse effect on imports and growth. In contrast, Rashid at al. (2012) have inspected the impact of export instability on the economic growth of selected SAARC countries (Sri Lanka, India, Pakistan and Nepal). They have determined that export instability has negative impact on the economic growth of these four countries. However, the magnitude of the impact is higher for Sri Lanka economy. Moreover, the investment and exports has significant and positive impact on the economic growth of Pakistan, India and Sari Lanka. However the impact of export on the economic growth is negative but insignificant for Nepalese economy

Dutt and Ghosh (1996) observe the causal association between growth and exports for a large sample of 26. The findings upkeep the export-led (ELG) growth hypothesis for Israel, Philippines, Switzerland, Mexico and Turkey, however, economic growth-led export hypothesis is supported by the United States and Pakistan. Moreover, bi-directional causality is supported for, France, Colombia and Morocco. In addition, the growth-led

exports hypothesis supports both developed and developing economies. Furthermore, Henriques and Perry (1996) examine the (ELG) hypothesis for Canada. This study shows that exports, terms of trade, and GDP are co-integrated. Moreover, this indicates that there is a long-run relationship among these variables. Second, Furthermore, this study backings the growth-driven exports hypothesis while reject the export-driven growth hypothesis. Moreover, Smith (2001) investigates the (ELG) hypothesis in case of Costa Rica. This study finds a long-run association between investment, exports, population and GDP. Moreover, the results demonstrate that the variables are co-integrated and share a linear common trend, i.e. the variables are moving together in the long-run. Still further, Yousif (2010) reinvestigates the influence of exports on growth in four of the Gulf countries, namely Kuwait, UAE, Saudi Arabia, and Oman. The results point out that exports have a significant positive impact on growth in the four Arab Gulf countries. In addition this study supports export-led growth hypothesis, however these countries are still highly dependent on oil. Moreover, Abbas (2012) investigates causal association between exports and GDP. The results reveal presence of one positive co-integrating relation. Moreover, the Granger causality test shows both short- and long-run unidirectional causality running from GDP toward exports. Furthermore, he determines that both in short- and long-run only progression in production cause exports expansion. However, Dritsakia and Stiakakis (2014) examine the effect of exports and foreign direct investments on economic growth in Croatia. The findings show a bi-directional long-run as well as short-run causation between exports and growth.

Ee (2015) observes the impact of exports on growth in selected Sub-Saharan African countries. Further, he test the validity of (ELG) hypothesis. Findings revealed that there

occurs a long-run affiliation between exports & growth. Moreover, the results of this study has proved that export-led growth strategy is effective in the (SSA) countries. Furthermore, Enu et al. (2013) have examined the impact of foreign trade on the economic growth in Ghana. The results specified that there exist a short-run and a long-run association among the real GDP, FDI, exports, imports in Ghana. Moreover, they have found that in the long-run, exports have a positive influence on the real gross domestic product consequently, an increase in exports leads to an expansion in real gross domestic product. However, imports and foreign direct investment have adverse effect on real gross domestic product, respectively. Therefore, a decrease in both variables causes an enhancement in real gross domestic product. In addition, Gokmenoglu et al. (2015) investigate the export led growth hypothesis in case of Costa Rica. The results show a long-run steady state relationship between exports and growth. Furthermore, the results of Granger causality indicate uni-directional causality from growth to export expansion of Costa Rica.

Herrerias and Orts (2009) have analyzed the relationship and the long-run causality among investment, imports, output and productivity. The results show that both investment and imports encourage labour productivity and output in the long-run, however, neither imports causes investment nor investment causes imports. Moreover, Ramos (2001) explores the Granger causality between imports, exports, & growth in Portugal. The outcomes do not show a uni-directional causality between the variables. Moreover, there is a feedback effect between imports-output progression and exports-output expansion. However, there is no significant causation between import-export growths. In contrast, Tahir et al. (2015) examine the relationship among foreign imports, FDI, remittances and economic growth for Pakistan. The results reveal that external determinants like foreign direct investment

(FDI), foreign imports and remittances have a significant impact on growth. Furthermore, foreign direct investment and remittances have a significant and positive role in the growth process. Moreover, they have found that imports have adverse impact on the economic growth. In addition, Ameri and Gerdtham (2006) introduce a different way of exploring linear & nonlinear Granger causation between imports, exports and economic growth in France. The results of both improved VEC and VEC (with geo-statistical methods) are same and showing the presence of long run uni-directional causality from imports and exports to economic growth, but F-statistic of improved-VEC for this relationship is bigger than VEC. Moreover, the geo-statistical method shows that there are some Spherical and Exponential functions in VEC construction instead of linear form.

2.2 Studies on the Nexus between Disaggregated Foreign Trade and Economic Growth

Growth is the back bone of the economy. The literature on the determinants of export and growth is voluminous. Instead of the sheer volume of export, a growing volume of literature since Chandran and Munusamy (2009) investigate the long-run association between trade openness and manufactured sector growth. They concluded that manufacturing sector play a role of driver for growth. Furthermore, the sector has relished fairly proven institutional setting (e.g. labor market, education, financial, and public infrastructure). This is also accompanied with positive and significant effects of trade openness. In addition, in the long-run, capital and labor are significantly influence the manufactured value added sector. Conversely, compared to capital investment, openness provide far better role in manufactured sector. More notably, manufacturing sector has stimulating implications for policy makers. It also shows that even though capital investment is imperative without freer import and export regime the industrial growth

could be at stake. Kim et al. (2009) investigate that either export is a cause or an effect of huge productivity of firms' in the manufacturing industries of Korea. They conclude that export is neither a cause of nor an effect of productivity in most circumstances. Further, they suggest that perfect information about foreign markets and take down cost of get into overseas markets might be key tools for stimulating firms' export participation.

Furthermore, Razmi (2007) investigates the existence of computable crowding out effects of manufactured sector in high-income markets of developing countries. He concludes that the existence of significant demand-side restrictions on export growth. Moreover, he finds indication of crowding out for the sample comprising all countries at the aggregated level. However, fragmenting the sample size into two splits reveals that the coefficient of crowding out for the period 1994–2004 is statistically significant. Furthermore, his findings show that due to the presence of China the coefficient of crowding out turn out to be insignificant when the possessions of Chinese exports are left out from this sample. Subsequently, China has been appeared as a foremost existence on worldwide markets in the early and mid-nineties, this is reliable with the finding of crowding out effect that fits significant in the second half of the sample period only.

Kavoussi (1984) reveals that in the middle and low income countries economic growth leads to high level of exports and better economic performance. Furthermore, primary exports also play a key part in the growth progression in both middle and low income countries. In contrast, Fosu (1990) shows that the primary exports sector show a little bit or no effect on GDP growth in the low income countries. However, the manufacturing sector has a positive impact. Meanwhile, Gylfason (1999) investigates the relationship among export, inflation and growth. The results indicate that high inflation and an

abundance of natural-resources tended to be related with slow growth and low exports. Moreover, the results show that plentiful natural resources can be a mixed blessing. However, unnecessary dependency on primary exports is associated with small total exports & slow growth. Similarly, Demetriades et al. (1993) conclude that manufacturing exports offer a very small push to economic growth and have only a minimal beneficial influence on the current account balance.

Moreover, Balassa (1985) have examined the relationship among export, policy choices and economic growth. They found that the rate of growth of exports prominently affected the rate of economic growth which further inclined by increases in the labor and by national savings. In the meantime, ceteris paribus, those countries, which are in the initial stage of development has been superior to upsurge their total factor productivity compare to those countries which have higher levels of development. A high share of manufactured exports also positively related with economic growth.

Franco and Sasidharan (2010) point out the impact of MNEs on the decision about export and intensity of export. This study finds that R&D of foreign firms is the only case, which represents significant and positive coefficient. Moreover, the positive and highly significant effect provides indication that domestic firms absorb imported technological knowledge effortlessly through R&D activity. Moreover, Sahoo et al. (2014) investigate the correlation among industrial production, mining export and economic growth in case of India. The outcomes show that one way short-run causality run from growth to mineral export. In the same way, the long-run causality is running from industrial production and economic growth to mineral export, which advocates the growth prompted export in case of India.

In theory, primary exports may have a negative or positive effect on economic growth. Primary exports put forth positive externalities on the non-export sector of the economy through an escalation in demand for resources and services, which may leads to enlarged economic growth for the whole economy. Conversely, Singer (1950) explicates that technological advancement will benefit the producers in the form of high profits and consumers in the form of lower prices which, for instance, primary products, generally means that a smaller amount of raw materials and labor will be employed per unit of output. As a result, prices for these goods fall, which leads to layoffs and lesser wages for workers in the country, which is exporting primary goods. Subsequently, labor are getting less money, which leads to less spending and low saving, which hampers economic growth. This problem is particularly prominent in developing countries, in which a huge segment of total exports are derived from primary exports.

In addition, Faridi (2012) has examined the relationship between non-agricultural, agricultural exports and GDP (gross domestic product) for Pakistan. The results of his study indicate that the impact of agricultural exports on GDP is negative and significant. Furthermore, there is bi-directional causality in agricultural exports and GDP. In addition, the economic growth falls as the export of agricultural products rises. Further, his study finds that the exports of non-agricultural goods have positive and significant impact on GDP. It is examined that there is bi-directional causation between non-agricultural exports and real GDP. In contrast, Bbaale and Mutenyo (2011) have argued that there is a positive and significant impact of growth in agricultural exports on per capita income growth for sub-Sahara African countries. However, the contribution of manufactured exports to the

growth of per capita income is insignificant. In addition, the findings of their study also support the key hypothesis that certain export components are more imperative for economic growth as compare to others. On the other hand, it is in contradiction of the broadly held theoretical outlook that manufactured exports are growth-enhancing and more productive due to the superior knowledge and high-tech spillover accompanying with manufactured compared to primary exports. Furthermore, the imports of capital goods from those countries, which are technologically advanced, embody technology and current knowledge have a positive & significant impact on EG. Moreover, gross capital formation, political systems, government consumption, capital goods imports, infrastructure, inflation rate, governance, and education are significantly influencing growth.

Khalafalla and Webb (2001) analyze the correlation between trade and GDP growth for Malaysia. They conclude that the impact of primary exports on economic growth is stronger than manufactures. Moreover, in the long- and short-run primary exports have significant growth generating effects. Furthermore, the findings for the period (1981-1996) show that there is no co-integration among GDP, manufactures exports and primary exports. Therefore, the hypothesis of balance equilibrium relationship for long-run among the variables is necessary to be rejected. However, the short-run outcomes confirm a positive causal relationship, which is running from manufactures exports toward GDP. In contrast, Torayeh and Neveen (2011) observe the long-run causal association between manufactured exports and growth in Egypt. The outcomes determine that bi-directional long-run causal relationship exists between manufacturing goods exports as a whole and economic growth. In addition, there is also a positive impact of export industries of Egypt like, chemical goods, textile goods, fabricated metal products and food-processing on

economic growth. Furthermore, the short-run unidirectional causation from exports of several industries to economic growth is investigated. The unidirectional causation from economic growth to exports is found for chemical goods only. The central decision is like a spherical causation between manufactured exports and growth in the long-run for Egypt.

Hussain (2010) investigates the factors of demand behind Pakistan's export performance at disaggregated level. His study found that disaggregated exports are quick to respond to relative prices and world demand. However, the degree of sensitivity is comparatively high for the export of value added goods than that of low value added or primary exports. Moreover, diversification of primary (low value added groups) to manufactured (high value added groups) seems to be the paramount strategy to benefit from spreading out of worldwide demand. Furthermore, Razmi (2006) examines the existence of crowding out effect evolving from competition of manufactured goods in the export market of intra-developing countries. The results show that in spite of an escalation in the elasticity of expenditures on imported goods in an industrialized country, in the 1990s crowding out effect come to be more significant. The estimated crowding out effect fluctuates across SITC categories, time periods, and levels of technological superiority of exports.

Herzer et al. (2006) point out the important role of disaggregated exports in the growth progression of Chile. They have found that manufactured exports have a productivity-enhancing effect. In contrast, primary exports have productivity-limiting effects. In addition, manufactured exports provide better potential in the form of knowledge spillovers and it also offer supplementary externalities compare to primary exports. Therefore, the main conclusion that arises from the their study is that both primary and manufactured exports positively donated to the economic growth of Chile, however, exports of

manufactured goods are specifically more important for efficiency in production and for long-run economic growth. Moreover, Khalafalla and Webb (2015) investigate the relationship among primary exports, manufacturing exports and growth for Malaysia. They have concluded that primary exports have a positive and stronger impact on growth than manufacturing exports. The fading support for the hypothesis of (ELG) afterwards the shift of Malaysia to export-oriented expansion strategy is linked with structural modifications related with industrialization. Collaboration between trade and growth turn into more multifaceted with a widening export base and more assorted foundations of growth.

Ghatak & Price (1997) investigate the (ELG) hypothesis for India. The results show the long-run nature of the relationship. Conversely, imports do not have a significant impact on growth for India. Moreover, nontraditional manufactured exports have stronger impact on output growth, while traditional manufactures have minute effect. Consequently, non-traditional manufactured export has a greater influence on output than traditional manufactured exports. In addition, evidence for the export-led growth (ELG) hypothesis may lie in disaggregated analyses not in aggregate exports. In addition, Uğur (2008) has explored empirically the impact of imports on economic growth in case of Turkey. Empirical results show that there is a bi-directional association between GDP and raw materials import and investment goods import. However, the findings reveal a unidirectional link between (GDP) and consumer goods import and other imports.

Mazol (2016) investigates the impact of intermediate and capital goods (ICGs) on GDP growth for Belarus. His results direct that the imports of intermediate and capital goods negatively contribute to economic growth. In contrast, Mazumdar (2001) explores the association between imported machinery and economic growth in LDCs. His study finds

that the import of machinery from developed countries stimulates higher growth in case of developing countries. The results also show that investment in locally produced equipment shrinks the growth rate however, investment in the import of equipment enhance the growth. Furthermore, Khan at al., (1995 examine the causality between exports growth and economic growth. They have found a stable and long-run bi-directional causality between manufactured exports output, however, there is unidirectional causality between primary exports and output. Moreover, the results also show bi-directional causality between exports (both primary and manufactured) growth and economic growth.

2.3 Summary of the Literature Review

Overall the empirical and theoretical literature demonstrates that there are a lot of studies, which have observed the impact of aggregate foreign trade on economic growth. It is observed that exports have significant & positive impact on economic growth. However, some studies show negative, while some show positive impact of imports on economic growth. There are also some studies which examine the impact of disaggregated (primary and manufactured) exports on economic growth, which show mix results for different countries. The impact of disaggregated foreign trade on economic growth for Pakistan has not been studied yet. Moreover, no effort has been made to investigate the separate impact of primary exports, semi processed exports, manufactured exports, consumer goods imports and capital goods imports on economic growth. So, in this study, we examine the impact of aggregate as well as disaggregate foreign trade on the economic growth of Pakistan.

Table 2-1: Literature Review (Foreign Trade and Economic Growth)

S.No	Authors	Data	Variables	Econometric techniques	Findings
1	Sakka and Mutairi (2000)	Sample of Arab countries for (1970-99)	Exports and GDP growth	Johansen-Juselius approach	No Cointegration
2	Khalafalla and Webb (2001)	Time series data for Malaysia from (1965-96)	Primary exports, Manufactured exports and GDP growth	VAR technique	Primary exports have stronger positive impact than manufactured exports on growth
3	Qaisrani (2002)	Time series data for Pakistan from (1972-94)	National income, exports instability, imports	OLS technique	Exports instability have no impact. Imports have positive impact on economic growth
4	Atique and Ahmad (2003)	Time series data for Pakistan from (1972-2000)	Exports, Real exchange rate, GDP	Almon lag procedure	GDP have positive impact on exports, while real exchange rate is insignificant
5	Shirazi and Manap (2004)	Time series data for Pakistan from (1960-2003)	Exports, Imports, GDP	VAR and Granger causality tests	Both exports and imports positively affect economic growth
6	Hameed et al. (2005)	Panel of six south Asian countries for (1973-2003)	Exports, GDP	OLS technique	Exports positively affect economic growth
7	Ugar & Inonu (2008)	Time Series (1994-2005)	Investment goods, imports raw material Imports Consumption goods imports	VAR and Granger Causality Tests	GDP↔ Invest goods import GDP ↔ Raw material unidirectional relationship

			GDP		between GDP & Consumption
8	Bbaale & Mutenyo (2011)	Sample of 35 Sub Saharan African Countries (SSA) (1998-2010)	Agricultural Exports, Manufactured Exports, Per capita Income	GMM	Agricultural Exports have positive impact on per capita income, but Manufactured exports is insignificant
9	Faridi 2012	Time Series (1972-2008) for Pakistan	Agricultural Exports, economic growth	Johansen Cointegration Test	Agricultural positively affects economic growth
10	Mehmood 2013	Time Series (1975-2012) for Pakistan	Export and Growth	Johansen Cointegration and Granger Causality Tests	Both export-led growth and growth-led export are supported
11	Dritsaki and Stiakakis (2014)	Time Series (1994-2012) for Croatia	Exports and Economic Growth	ECM-ARDL model	Exports↔ GDP

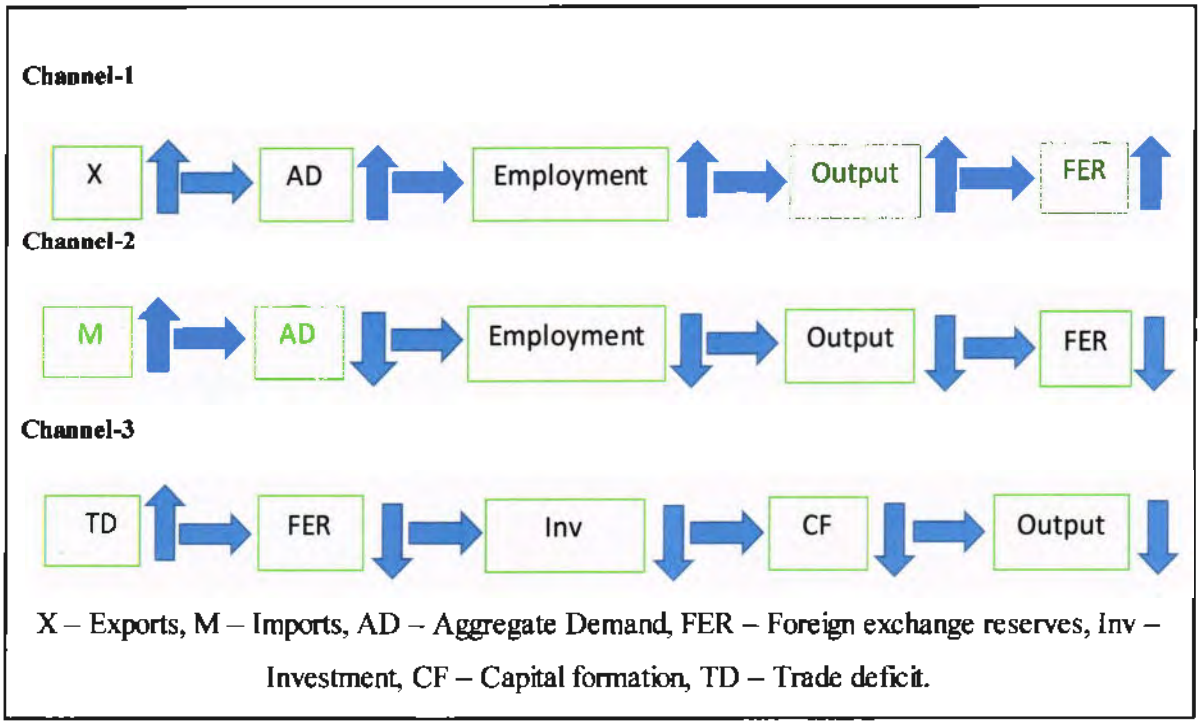
Chapter 3

Theoretical Framework and Empirical Model

An analysis of the relationship between economic growth and exports will lead one to conclude that both are positively related. Intuitively, in the meantime exports are constituent of aggregate demand/GDP, an increase in exports inevitably increase GDP, and other things remain same. However, exports create prospective positive externalities. Pushing forward exports, in addition to increase GDP directly, might also lead to positive externalities in the form of efficient management, knowledge spillovers and production techniques in the non-export sector. This, further leads to more innovation and improvement in production expansion in the export and other sectors of the economy and subsequently rising incomes and boosting growth. Export sector also be responsible for high foreign exchange required to buying imports, which may streamline additional beneficial effects on growth. In contrast, imports negatively affect economic growth, generally in developing countries. For instance, the US dollar value against rupee is very high, which make imported goods very expensive for Pakistan. Moreover the terms of trade of Pakistan against developed countries are not favorable. The prices of exports are falling overtime and that of imports are increasing.

The following channels show different impacts of exports, imports and trade deficit.

Figure 3-1: Different Channels of Exports, Imports and Trade Deficit



X – Exports, M – Imports, AD – Aggregate Demand, FER – Foreign exchange reserves, Inv – Investment, CF – Capital formation, TD – Trade deficit.

The above channels show the positive impacts of exports. However, imports and trade deficit (TD) have negative impacts. The high value of net exports has a good impact on economic growth. The increase in exports enhances industrial output, improves industrial facilities and creates more job opportunities. In addition, increase in exports also attracts funds into the country. However, Pakistan economy is dependent on agricultural sector and supported by the industrial sector to some extent. Its exports are mostly composed of raw material instead of finished or manufactured goods and imports are mostly capital goods and petroleum products. The difference in volumes of exports and imports is a major reason but there are bulk of other problems due to which we face balance of payment problems. Our economy faces sustained sever energy shortage and lack of skilled labor which lead to high cost of production and business. The weak infrastructure, narrow scope for joint venture and inconsistent policies also negatively contribute to our growth process. In particular, terrorism and worsening law and order situation is negatively affecting FDI and

transfer of technology. The inefficiency in labor productivity, lack of expenditure on research and development and unawareness about marketing techniques are also main reason of trade deficit

The central argument for a divergent impact of primary and manufacturing exports on economic growth is that exports of primary goods are unprocessed and raw while manufactured exports are technologically intensive, and for that reason they create positive spillovers effects on growth. The literature on primary exports show mixed results. Exports of primary products effect economic growth positively or negatively. It is the manufacturing sector that plays a positive role in growth of the economy Chandran and Munusamy (2009).

Those countries which have low levels of human capital are not seem to benefit from exporting goods to other countries; in especial, the relationship between manufacturing exports and economic growth is relatively large and negative. But, once a country achieve an essential level of educated and skilled workers, the yields from the exports of manufacturing goods are greatly upsurges, likewise the return on physical capital. Moreover, there are a number of policy implications that might be gleaned through this study. First, high investment in the manufacturing sector of the economy without the required skilled and educated labor force is similar to the use of resources inefficiently. Second, the export of manufacturing goods are more vastly interrelated with economic growth than primary product exports and semi processed exports, however it depends on the level of human capital in a country. A policy of manufacturing exports promotes technological progress. Speedy growth in manufacturing sector needs close relations with multinational companies that provide, technology, intermediate inputs, capital goods and

exports market. These links provide a dominant means for firms, through which they can learn by doing.

3.1 Empirical Model

As the main purpose of the study is to explore the impacts of foreign trade on economic growth, we have to show the economic growth (measured by log difference of real GDP) as a function of the exports, imports and other variables like , human capital, physical capital and labor force etc.

This study adopts the augmented version of the neo-classical growth model due to Mankiw et al. (1990). This model assumes endogenous technological progress as an important determinant of growth. The production function in its standard format is shown as follows.

$$Y_t = A_t K_t^{\alpha} H_t^{\beta} L_t^{\gamma} e^{\mu_t} \quad (1)$$

where Y_t denotes real GDP at time t, K_t denotes physical capital, H_t denotes human capital, L_t denotes labor force, A_t denotes technological progress, where the parameters α, β and γshow the partial elasticities of physical capital, human capital and labor force with respect to output. If the production function exhibits constant return to scale, then $\gamma = 1 - \alpha - \beta$, where α and β are positive but less then unity.

Equation (1) can be transformed to linear form by taking natural log.

$$\ln Y_t = \ln A_t + \alpha \ln K_t + \beta \ln H_t + \gamma \ln L_t + \mu_t \quad (2)$$

The above model can be augmented further and we may incorporate other variables like exports and imports. We follow the procedure adopted by Herzer (2006) and Kavoussi (1984) who assume that other variables affect economic growth indirectly through their

impact on the total factor productivity denoted by A_t. So following these studies, we assume that exports and imports have impact on economic growth through A_t, That is,

$$\ln A_t = \alpha_1 + \alpha_2 \ln Exp_t + \alpha_3 \ln Imp_t \quad (3)$$

Substituting equation (3) into equation (2), we get the augmented version of the neoclassical growth model for aggregate foreign trade as follow.

$$\ln Y_t = \alpha_1 + \alpha_2 \ln Exp_t + \alpha_3 \ln Imp_t + \alpha_4 \ln L_t K_t + \alpha_5 \ln H_t + \alpha_6 \ln L_t + \mu_t \quad (4)$$

In the above relation, Y_t is economic growth, Exp_t is exports, Imp_t is imports, K_t is physical capital, H_t is human capital, L_t is labor force, α_1 is the intercept parameter. All coefficients are respective elasticities and μ_t is the usual error term.

To see the relative importance of primary exports, semi processed exports, manufactured exports, consumer goods imports, and capital goods imports. We may write exports and imports in disaggregated fashion;

$$\ln Exp_t = \gamma_1 \, lnPRExp_t + \gamma_2 lnSPExp_t + \gamma_3 \, lnMExp_t \quad (5A)$$

where γ_1, γ_2 and γ_3 represent the relative shares of primary, semi processed and manufactured items in total exports.

$$\ln Imp_t = \delta_1 \, lnCNImpt_t + \delta_2 \, lnCPImpt_t \quad (5B)$$

$\delta_1$and δ_2 represent the relative shares of consumer goods and capital goods in total imports.

In view of the above, we may estimate the following extended model;

$$\ln Y_t = \beta_1 + \beta_2 \ln PRExp_t + \beta_3 \ln SPExp_t + \beta_4 \ln MNExp_t + \beta_5 \ln CNImp_t + \beta_6 \ln CPImp_t + \beta_7 \ln K_t + \beta_8 \ln H_t + \beta_9 \ln L_t + \varepsilon_t \quad (6)$$

The symbols stand for: $PRExp_t$ for primary exports,$SPExp_t$ for semi processed exports, $MNExp_t$ for manufacturing exports, $CNImp_t$ for consumer goods imports, $CPImp_t$ for capital goods imports.All the coefficients are constant elasticities and ε_t is the usual error term.

3.2 Explanation of Variables

Economic Growth is the dependent variable in this study. Economic growth is known as the percentage change in the gross domestic product of a country at current over the previous period.

3.2.1 Explanatory Variables

In this study we have ten explanatory variables as discussed below.

(i) Exports (Exp)

Exports constitute a significant part of foreign trade as well as aggregate demand/output. The main exports of Pakistan are manufactured goods, beverage, tobacco, food, live animals, crude material, miscellaneous articles, and machinery. The top exports partners of Pakistan are European Union, United State (US), China, UAE and Saudi Arabia. Exports are further disaggregated as under.

(a) Primary Exports (PRExp)

Those goods which are obtained without much processing. Main sources of primary exports of Pakistan are agriculture, fishing, forestry and mining.

(b) Semi Processed Exports (SMExp)

Those goods which are processed in industry to some extent so as to be used as industrial raw material. In other words these goods are used as input for transformation into final

good in other industry. Pakistan exports cotton yarn, leather and animal casing etc to other countries.

(c) Manufactured Exports (MNExp)

These are the tangible goods obtained from conversion of raw material through manufacturing process into useful industrial or consumable goods. Pakistan exports cotton yarn, foot wear, ready-made garments, carpets, rugs, sports goods, surgical instruments and other textiles etc.

(ii) Imports (Imp)

Imports represent the value of all goods and services received from the rest of the world. Pakistan imports machinery, petroleum, chemical, fertilizer, edible oil, vehicles, spareparts, iron ore, steel, wheat, tea, and pharmaceutical products etc.

(α) Consumer Goods Imports (CNImp)

Pakistan imports consumer goods in the form of food items, luxury cars, petroleum, iron, steel, rubber tyres etc. However, a clear distinction between consumer goods and industrial raw material cannot be drown.

(β) Capital Goods Imports (CPImp)

Capital goods are used for in the process of production. These goods increase efficiency of labor and improve the productive capacity of a country. Pakistan imports machinery, transportation equipment's, power generating machines, motor vehicles and others.

(iii) Physical Capital (K)

It is very difficult to measure the stock of physical capital. However, investment leads to capital formation and it has a significant impact on economic growth. Following (Herzer

et al., 2006), this study uses the gross fixed capital formation (private + public) as a proxy for physical capital.

(iv) Human Capital (H)

Human capital comprises the skills and capabilities embodied with human (Nik et al. 2013). In the wider terms, it talk about the attainment of knowledge, experience, abilities, skills and intelligence by persons. It has a positive impact on economic growth. For example, if human capital increases, it means individuals have more knowledge, skills and experience which lead to high production and more employment opportunities. Human capital also increase per worker income. To measure human capital we use rates of return to education as a proxy.

(v) Labor Force (L)

Pakistan is a labor-intensive country and labor force is that segment of the population, which is economically active and ages at least 15. Following literature (Shahid, 2014; Siddiqui et al., 2008) we use total labor force as a proxy to capture the role of labor force in the economy and to draw meaningful conclusions.

3.3 Data and Sources

This study will use time series data from 1970-2014 The data on economic growth and other variables are from the (World Bank's WDI) and from economic survey of Pakistan. Table 3.1 below provides an account of the variables to be used in the study.

Table 3-1: Variables Definition and Source

Variables	Abb	Definition	Source
Economic Growth	Y_t	Log difference of real GDP	(World Bank's WDI)
Exports	Exp_t	Total exports	Pakistan Economic survey (2014-15)
Imports	Imp_t	Total imports	Pakistan Economic survey (2014-15)
Consumer goods imports	$CNImp_t$	Total consumer goods imports	Pakistan Economic survey (2014-15)
Capital goods imports	$CPImp_t$	Total capital goods imports	Pakistan Economic survey (2014-15)
Primary Export	$PRExp_t$	Primary exports	Pakistan Economic survey (2014-15)
Manufacturing Export	$MNExp_t$	Manufacturing exports	Pakistan Economic survey (2014-15)
Semi Processed Exports	$SPExp_t$	Semi processed exports	Pakistan Economic survey (2014-15)
Labor force	L_t	Labor force	Labor force survey (2014-15)
Physical capital	K_t	Gross fixed Capital formation as a proxy to measure physical capital	(World Bank's WDI)
Human Capital	H_t	Rates of return to education	Penn world table 8.1

Chapter 4

Estimation strategy/Methodology

It is essential to confront the time series data to the following tests before formal estimations.

4.1 Unit root test

For time series, it is necessary to check the series for stationarity, or to check for the order of integration. It is usually thought that almost every time series are non-stationary and has a unit root. Such a non-stationary data can be converted into stationary through consecutive differencing. The Dickey-Fuller test is a suitable and modest technique for checking the order of integration. The Dickey-Fuller test is specified in the AR form as follows;

$$\Delta y_t = \delta y_{t-1} + \varepsilon_t \qquad (7)$$

where, "ε_t" signifies the errors which are stationary variables and identically distributed. The null hypothesis of Dickey-Fuller test which has to be tested is that; H_0: $\delta = 1$, which means that the series is non-stationary and has unit root, while the alternative hypothesis that H_1: $\delta < 1$, which means that the series is stationary and the unit root problem is not exist. The DF test is effective only in case of white noise errors (ε_t). Conversely, if error terms are not white noise, in this case the validity of the Dickey-Fuller test is not applicable. To sidestep this problem, the Dickey and Fuller (1997) have recommended the Augmented Dickey-Fuller (ADF) test which is acquired by accumulation of lag values of dependent variable to the Dickey-Fuller regression. This provides the following design of the ADF test;

$$\Delta y_t = \alpha + \delta \Delta y_{t-1} + \varepsilon_t \quad (8)$$

In equation (8), "Δy_{t-1}" denotes the lagged dependent variable to estimate the autocorrelation. Moreover, we employ the stationarity test for the concerned variables.

The distribution support the assumption of Dickey-Fuller tests that the errors have constant variance and they are statistically independent. Phillips and Perron (1988) established a generalization of the Dickey-Fuller technique that sanctions for fairly warm assumptions regarding the distribution of the error terms. Therefore the Phillips Perron test permits the error terms to be weekly dependent on each other and they are heterogeneously distributed. In this case the regression equations are as follows:

$$Y_t = b_0^* + b_1^* Y_{t-1} + \mu_t \quad (9)$$

$$Y_t = b_0^{`} + b_1^{`} Y_{t-1} + b_2^{`} \left(t - \frac{n}{2}\right) + \mu_t \quad (10)$$

n = Number of Observations

μ_t = E (μ_t) = 0 -----but there is no requirement that the disturbance term is serially un correlated or homogeneous. The hypothesis in this case b* = 1 and $b^{`}$ = 1 and $b_2^{`}$ = 0

4.2 Testing for Cointegration (Johansen Method)

We employ the full information maximum likelihood (FIML) procedure developed by Johansen (1995). In Johansen's procedure all the variables are treated as potentially endogenous to avoid the issue of normality of the cointegrating vector on one of the variables. Johansen's procedure also determine the co-integrating relations in addition to

produce maximum likelihood estimators. These maximum likelihood estimators are not normally distributed but asymptotically normally distributed. The estimators of normal distributions also provide useable statistical interpretation by means of conventional test statistics.

The Johansen methodology use maximum likelihood technique to estimate cointegrating relations between I(1) series. The procedure also provide information about the number of cointegrating relations. The Johansen methodology based on the unrestricted vector autoregression VAR (p) model is represented by the following equation:

$$y_t = \mu + \sum_{j=1}^{k} y_{t-k} + \varepsilon_t \qquad (11)$$

where y_t shows (n × 1) column vector of n I(1) variables, $\amalg_k$ provide information about a coefficient matrix, μ denotes a (1 × n) vector of constants, p indicates the length of lag value, and ε_t is an error term identically and independently distributed with constant variance and zero mean. As

$y_t = [LnY_t, LnK_t, LnH_t, LnL_t, LnCnimp_t, LnCpimp_t, LnPExp_t, LNSPExp_t, LnMExp_t]'$ it is assumed that the variables are integrated of order one, allowing $\Delta y_t = y_t - y_{t-1}$, equation (11) can be revised in first difference or vector error correction (VECM) procedure as:

$$\Delta y_t = \mu + \sum_{k=1}^{p-1} \Gamma_k \, \Delta y_{t-k} + \amalg y_{t-1} + \epsilon_t \qquad (12)$$

where Γ_k and $\amalg$ denote coefficient matrices and matrix $\amalg$ of rank r determines the amount of cointegrating relationships in the system. Such as Δy_{t-k} and Δy_t variables are integrated at level and y_{t-1} variables are integrated of order one, equation (12) will become balance

if the variables on both side of the equation are integrated of same order. This will occur only if r = 0, so that $\Pi = 0$, in this case there is no cointrgrating relationships among the variables in y_t, in addition, the parameters of Π are such that Πy_{t-1} is also I(0). So, in the first situation (r = 0; $\Pi = 0$), equation (12) represents a traditional VAR approach in first differences. However, in the second case when the rank of Πwhich is greater than zero, representing that there will be r < n cointegrating relationships, it means that there are r stationary linear association of $y_t$possible. If 0 < r < n, then the reduced rank matrix Π can be disintegrated into two matrices α and β (each n × r), such that:

$$\Pi y_{t-1} = \alpha (\beta' y_{t-1}) \quad (13)$$

In the above equation, the loading matrix α comprises the coefficients of error correction quantifying the speed of adjustment to restore equilibrium. On the right-hand side the second term ($\beta' y_{t-1}$) denotes the cointegrating relations. Though y_t is nonstationary but the vector of cointegrating relation β have the property that$\beta' y_t$ is stationary. The maximum-eigenvalue and trace statistics are used to find the number of cointegration relationships (the cointegration rank), r. The null hypothesis of trace statistic shows that the number of different cointegrating vectors is less or equal to r against the alternative hypothesis of n cointegrating relationships. The eigenvalue test estimates the null hypothesis of r cointegrating vectors in contrast to the alternative of r + 1 cointegrating vectors. Conversely, in case of small samples size like ours, these statistics incline to falsely reject the null hypothesis of no long-run relationship. The utmost straight- forward solution to this issue is to adjust the test statistics by using the small sample correction factor (T − n × p) / T downward as proposed by Reinsel and Ahn (1992), where T indicate the size of sample, which is (T = 44) in this study, n is used to measure the number of concerned

variables (n = 9) and p is the optimal lag length, which is determined by the Schwarz information criterion. For the determination of optimal lag, the Schwarz criterion is superior to other criterion, when using VAR technique (Lütkepohl, 1985).

4.3 Estimation of the Long Run Elasticities: (Dynamic OLS)

We check the robustness of the cointegration estimates through dynamic ordinary least square. Hence, the FIML estimates in a small sample are sensitive in the selection of optimal lag length and it is also very sensitive to the model specification, we additionally utilize the dynamic ordinary least square (DOLS) technique as suggested by Saikkonen (1991). This technique is asymptotically similar to Johansen's FIML procedure, however execute very well in case of small sample size. In addition, DOLS generates asymptotically efficient and unbiased estimates for variables that are cointegrate, even in the presence endogenous regressors.

The DOLS regression in our case for aggregate foreign trade and economic growth is given bellow:

$$lnY_t = \beta_1 + \beta_2 lnK_t + \beta_3 lnH_t + \beta_4 lnL_t + \beta_5 lnImp_t + \beta_6 lnExp_t + \sum_{i=-k}^{i=k} \phi_1 \Delta lnK_{t+i} + \sum_{i=-k}^{i=k} \phi_2 \Delta lnH_{t+i} + \sum_{i=-k}^{i=k} \phi_3 \Delta lnL_{t+i} + \sum_{i=-k}^{i=k} \phi_4 \Delta lnImp_{t+i} + \sum_{i=-k}^{i=k} \phi_5 \Delta lnExp_{t+i} + \varepsilon_t \quad (14)$$

The DOLS regression for disaggregate foreign trade and economic growth:

$$lnY_t = \beta_1 + \beta_2 lnK_t + \beta_3 lnH_t + \beta_4 lnL_t + \beta_5 lnCNImp_t + \beta_6 lnCPImp_t + \beta_7 lnPRExp_t + \beta_8 lnSPExp_t + \beta_9 lnMNExp_t + \sum_{i=-k}^{i=k} \phi_1 \Delta lnK_{t+i} + \sum_{i=-k}^{i=k} \phi_2 \Delta lnH_{t+i} + \sum_{i=-k}^{i=k} \phi_3 \Delta lnL_{t+i} + \sum_{i=-k}^{i=k} \phi_4 \Delta lnCNImp_{t+i} + \sum_{i=-k}^{i=k} \phi_5 \Delta lnCPImp_{t+i} + \sum_{i=-k}^{i=k} \phi_6 \Delta lnPRExp_{t+i} + \sum_{i=-k}^{i=k} \phi_7 \Delta lnSPExp_{t+i} + \sum_{i=-k}^{i=k} \phi_8 \Delta lnMNExp_{t+i} + \varepsilon_t \quad (15)$$

where, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and β_9 are the long-run elasticities, and ϕ_1, ϕ_2, ϕ_3, ϕ_4, ϕ_5, ϕ_6, ϕ_7 and ϕ_8, are showing the coefficients of lag and lead differences, they are treated in the model as nuisance parameters. These act as to adjust for conceivable autocorrelation, endogeneity, and non-normal residuals for the consistent estimates of β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8 and β_9. Similar to model for aggregate foreign trade and economic growth, the equation of DOLS is estimated using two lags and leads (k = 2) for disaggregated foreign trade and economic growth.

4.4 Auto Regressive Distributed lag Model (ARDL)

Pesaran, Shin and Smith (PSS 2001) developed a new approach to co-integration testing which is applicable irrespective of whether the regressor variables are I(0), I(1) or mutually co-integrated. As an alternative we re-estimated this basic quarterly inflation model using

the ARDL technique along the lines suggested by PSS (2001). The ARDL model is prefer over others because it is helpful in fixing the problem of serial correlation in the residuals.

The Auto Regressive Distributed Lag (ARDL) model (see Pesaran et al., 2001) comprises by estimating the conditional error correction (EC) form of the ARDL technique for aggregate foreign trade and economic growth.

$$\Delta lnY_t = \alpha_1 + \sum_{i=1}^{p} \phi_i \Delta lnY_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnK_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnH_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnL_{t-i}$$
$$+ \sum_{i=0}^{p} \phi_i \Delta lnImp_{t-i} + \sum_{i=0}^{p} \phi_{6i} \Delta lnExp_{t-i} + +\beta_1 lnY_{t-1} + \beta_2 lnK_{t-1}$$
$$+ \beta_3 lnH_{t-1} + \beta_4 lnL_{t-1} + \beta_5 lnImp_{t-1} + \beta_6 lnExp_{t-1} + \mu_t \qquad (16)$$

where lnY_t, lnK_t, lnH_t, lnL_t, $lnImp_t$ and $lnExp_t$ are real GDP, physical capital, human capital, labor force, imports and exports in natural logarithm (ln) form, Δ indicate the first difference operator and p denotes the optimal lag length.

The conditional error correction (EC) form of the ARDL model for disaggregated foreign trade and economic growth.

$$\Delta lnY_t = \gamma_1 + \sum_{i=1}^{p} \phi_i \Delta lnY_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnK_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnH_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnL_{t-i}$$

$$+ \sum_{i=0}^{p} \phi_i \Delta lnCNImp_{t-i} + \sum_{i=0}^{p} \phi_{6i} \Delta lnCPImp_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnPREXp_{t-i}$$

$$+ \sum_{i=0}^{p} \phi_i \Delta lnSPExp_{t-i} + \sum_{i=0}^{p} \phi_i \Delta lnMNExp_{t-i} + \beta_1 lnY_{t-1} + \beta_2 lnK_{t-1}$$

$$+ \beta_3 lnH_{t-1} + \beta_4 lnL_{t-1} + \beta_5 lnCNImp_{t-1} + \beta_6 lnCPImp_{t-1}$$

$$+ \beta_7 lnPREXp_{t-1} + \beta_8 lnSPExp_{t-1} + \beta_9 lnMNExp_{t-1} + \in_t \qquad (17)$$

where lnY_t, lnK_t, lnH_t, lnL_t, $lnCNImp_t$, $lnCPImp_t$, $lnPRExp_t$, $lnSPExp_t$ and $lnMNExp_t$ are real GDP, physical capital, human capital, labor force, consumer goods imports, capital goods imports, primary exports, semi processed exports and manufactured exports in natural logarithm, Δ indicate the short-run change operator and p denotes the optimal lag length.

4.4.1 ARDL Bounds Test

The ARDL Bound test is used to estimate the long-run relationship among the variables. The null hypothesis for no long-run relationship among variables is H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ against the alternative hypothesis H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$. The test comprises asymptotic critical value bounds, which depend on whether the variables are I(0) or I(1) or a mixture of both. The test creates two series I(0) and I(1) of critical values. Critical values for the I(1) series are stated the upper bound critical values, whereas the critical values for I(0) series are referred to as the lower bound critical values. If the value of F-statistic go beyond their corresponding upper bound values, we can reject the null hypothesis of no long run relationship and accept the alternative hypothesis of a long-run

association between the variables irrespective of the order of integration of the variables. If the value of F-statistic is lower than the upper bound value, we cannot reject the null hypothesis that there is no long-run relationship among the variables and if the value lies between the upper and lower bounds, without information about order of integration of concerned regressors, we cannot make any fruitful inference.

After confirming the long-run relationship among the variables, we estimate the long-run model for aggregate foreign trade and economic growth is given below:

$$lnY_t = \alpha_1 + \sum_{i=1}^{p} \phi_{1i}\, \Delta lnY_{t-i} + \sum_{i=0}^{p} \phi_{2i}\, \Delta lnK_{t-i} + \sum_{i=0}^{p} \phi_{3i}\, \Delta lnH_{t-i} + \sum_{i=0}^{p} \phi_{4i}\, \Delta lnL_{t-i} + \sum_{i=0}^{p} \phi_{5i}\, \Delta lnImp_{t-i} + \sum_{i=0}^{p} \phi_{6i}\, \Delta lnExp_{t-i} + \mu_t \quad (18)$$

The long-run ARDL model for disaggregated foreign trade and economic growth is given below:

$$lnY_t = \gamma_1 + \sum_{i=1}^{p} \delta_{1i}\, \Delta lnY_{t-i} + \sum_{i=0}^{p} \delta_{2i}\, \Delta lnK_{t-i} + \sum_{i=0}^{p} \delta_{3i}\, \Delta lnH_{t-i} + \sum_{i=0}^{p} \delta_{4i}\, \Delta lnL_{t-i} + \sum_{i=0}^{p} \delta_{5i}\, \Delta lnCNImp_{t-i} + \sum_{i=0}^{p} \delta_{6i}\, \Delta lnCPImp_{t-i} + \sum_{i=0}^{p} \delta_{7i}\, \Delta lnPRExp_{t-i} + \sum_{i=0}^{p} \delta_{8i}\, \Delta lnSPExp_{t-i} + \sum_{i=0}^{p} \delta_{9i}\, \Delta lnMNExp_{t-i} + \epsilon_t \quad (19)$$

The ARDL specification showing the short-run dynamics for aggregate foreign trade and economic growth can be estimate through an error correction model (ECM) of the subsequent form:

$$\Delta lnY_t = \delta_1 + \sum_{i=1}^{p} \phi_1 \Delta lnY_{t-i} + \sum_{i=0}^{p} \beta_1 \Delta lnK_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta lnH_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta lnL_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta lnImp_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta lnExp_{t-i} + \varphi ECM_{t-1} + \epsilon_t \quad (20)$$

The coefficients of the above short-run equation for aggregate foreign trade and economic growth are coefficients describing the short-run dynamics of the model's convergence to the equilibrium state and φ symbolizes the speed of adjustment. ECM_{t-1} denotes the error correction term, which is define as below:

$$ECM_t = lnY_t - \alpha_1 - \sum_{i=1}^{p} \phi_{1i} \Delta lnY_{t-i} - \sum_{i=0}^{p} \phi_{2i} \Delta lnK_{t-i} - \sum_{i=0}^{p} \phi_{3i} \Delta lnH_{t-i} - \sum_{i=0}^{p} \phi_{4i} \Delta lnL_{t-i} - \sum_{i=0}^{p} \phi_{5i} \Delta lnImp_{t-i} - \sum_{i=0}^{p} \phi_{6i} \Delta lnExp_{t-i} \quad (21)$$

The ARDL methodology of the short run dynamics for disaggregated foreign trade and economic growth can be achieved by constructing an error correction model (ECM) given in the following equation:

$$lnY_t = \vartheta_1 + \sum_{i=1}^{p} \phi_1 \Delta lnY_{t-i} + \sum_{i=0}^{p} \beta_1 \Delta lnK_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta lnH_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta lnL_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta lnCNImp_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta lnCPImp_{t-i} + \sum_{i=0}^{p} \beta_6 \Delta lnPRExp_{t-i} + \sum_{i=0}^{p} \beta_7 \Delta lnSPExp_{t-i} + \sum_{i=0}^{p} \beta_8 \Delta lnMNExp_{t-i} + \phi ECM_{t-1} + \epsilon_t \quad (22)$$

All the coefficients of the above equation for disaggregated foreign trade and economic growth are coefficients concerning the short run dynamics of the model's convergence to the equilibrium state and φ symbolizes the speed of adjustment. where ECM_{t-1} is the error correction term, which is define as below:

$$ECM_t = lnY_t - \gamma_1 - \sum_{i=1}^{p} \delta_{1i} \Delta lnY_{t-i} - \sum_{i=0}^{p} \delta_{2i} \Delta lnK_{t-i} - \sum_{i=0}^{p} \delta_{3i} \Delta lnH_{t-i}$$
$$- \sum_{i=0}^{p} \delta_{4i} \Delta lnL_{t-i} - \sum_{i=0}^{p} \delta_{5i} \Delta lnCNImp_{t-i} - \sum_{i=0}^{p} \delta_{6i} \Delta lnCPImp_{t-i}$$
$$- \sum_{i=0}^{p} \delta_{7i} \Delta lnPRExp_{t-i} - \sum_{i=0}^{p} \delta_{8i} \Delta lnSPExp_{t-i}$$
$$- \sum_{i=0}^{p} \delta_{9i} \Delta lnMNExp_{t-i} \quad (23)$$

Chapter 5

Results and Analysis

In this chapter, we discuss the results of different econometric techniques namely Johansen cointegration test, Dynamic OLS and ARDL, which are employed to find the impact of foreign trade on economic growth at aggregated and disaggregated level. The chapter is divided into two main sections. In the first section, we discuss the impact of aggregate foreign trade on economic growth and in the second section, the results of disaggregated foreign trade and economic growth are discussed. The above sections are further divided into four sub-sections to discuss the results of Johansen Cointegration, the results of Dynamic OLS, the results of ARDL and finally, to provide a brief comparison of the three models. At the end of the chapter, we discuss the auto correlation, heteroskedasticity and normality issues of the model.

5.1 Results for the Relationship of Aggregate Foreign Trade and Economic Growth

Since our data is time series so it is essential to check the data for stationarity before running any regression analysis. Therefore, we have to check the data for presence of unit roots by applying (ADF) and Philip and Perron test. The results of these tests are reported in the appendix. The results show that all the variables in our model are non-stationary at level, however, they become stationary at first differences.

5.1.1 Johansen Cointegration test

After confirming that all variables are of the order I(1) we utilize Johansen cointegration methodology to check that the variables are cointegrated in the long-run or not. Table 5.1 shows that the null hypothesis of no cointegration is rejected at 1 % level of significance. However, the alternative hypothesis of at most 5 cointegration equations is accepted at 10 % level of significance. Moreover, the results of maximum eigenvalue test shown in Table 5.2 indicate the rejection of null hypothesis of no cointegration relation. The results confirm the acceptance of alternative hypothesis in case of 2 cointegrating relations. Therefore, on the basis of both trace test and maximum Eigenvalue test, we conclude that there is a long run relationship among the variables.

Table 5-1: Unrestricted Co-Integration Rank Test (Trace) for Aggregate Foreign Trade and Economic Growth

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value (0.05)
None *	0.765***	163.667	103.847
At most 1 *	0.598***	104.275	76.972
At most 2 *	0.453***	66.890	54.079
At most 3 *	0.396***	42.131	35.192
At most 4 *	0.284**	21.449	20.261
At most 5	0.171*	7.698	9.164

Note: (***), (**) and (*) represent 1%,5% and 10% level of significance respectively. Trace test point out 5 cointegrating equations at the 0.05 level,* denotes rejection of the hypothesis at the 0.05 level and **MacKinnon-Haug Michelis (1999) p-values.

Table 5-2: Unrestricted Co-Integration Rank (Maximum Eigenvalue) Test for Aggregate Foreign Trade and Economic Growth

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value
None *	0.765***	59.392	40.956
At most 1 *	0.598**	37.384	34.805
At most 2	0.453	24.759	28.588
At most 3	0.396	20.681	22.299
At most 4	0.284	13.750	15.892
At most 5	0.171*	7.698	9.164

Note: (***), (**) and (*) represent 1%,5% and 10% level of significance respectively. Max-eigenvalue test indicates 2 cointegrating equations at the 0.05 level.* denotes rejection of the hypothesis at the 0.05 level.

The following Table shows the normalized cointegrating coefficients.

Table 5-3: Aggregate Foreign Trade and Economic Growth: Johansen Test

Normalized cointegrating coefficients (standard error in parentheses) **Dependent variable: lnY**						
	lnK	lnH	lnL	lnImp	lnExp	C
lnY	1.669***	5.429***	0.024	-1.154***	0.236**	-3.559
	(0.180)	(0.658)	(0.243)	(0.176)	(0.091)	(2.501)
Note: (***),(**),(*) represent 1%,5% and 10% level of significance respectively.						

From Table 5.3, it can be concluded that physical capital, human capital, labor force and exports have a positive impact on economic growth, whereas, the imports negatively affect economic growth. Moreover, Pakistan economic growth increases by 0.036 % as a result of 1 % rise in exports. In contrast, a 1% increase in imports leads to a 1.15 % decline in

economic growth. These results suggest that exports promote economic growth through the channel of productivity. However, the impact of imports is adverse for economic growth.

5.1.2 Results of Dynamic Least Square Model.

The results are shown in Table 5.4 below.

Table 5-4: Aggregate Foreign Trade and Economic Growth: Dynamic Least Squares (DOLS)

Dependent Variable: lnY			
Variable	Coefficient	Std. Error	t-Statistic
lnK	1.352***	0.194	6.959
lnH	5.552***	0.332	16.687
lnL	0.588***	0.121	4.824
lnImp	-1.093***	0.191	-5.722
lnExp	0.247***	0.033	7.414
C	-0.285	2.788	-0.102
R-squared	0.999	Mean dependent var	27.942
Adjusted R-squared	0.999	S.D. dependent var	1.575
S.E. of regression	0.014	Sum squared resid	0.001
Long-run variance	5.92E-05		
Note: (***), (**), (*) represent 1%, 5% and 10% level of significance respectively.			

The results obtained from DOLS in Table 5.4 are consistent with the results of Johansen cointegration test. Physical capital, human capital, labor force and exports have positive and significant coefficients at 1% level, which means that all these variables enhance

economic growth. In contrast, imports have negative and significant coefficient at 1% level, which means that 1 % increase in imports leads to 1.09 % decrease in economic growth.

5.1.3 Aggregate Foreign Trade and Economic Growth: Auto Distributed Lag (ARDL)

To show the impact of aggregate foreign trade on economic growth, we have estimated three different models through ARDL approach. The results are reported in Table 5.5. 5.6 and 5.7 below.

Table 5-5: ARDL Bounds Test Results

Test Statistic	Value	
F-statistic	7.245061	
Critical Value Bounds		
Significance	I(0)Upper Bound	I(1) Upper Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

From Table 5.5 the bound test suggests that the F-statistic value is greater than the upper bound value, therefore, we reject the null hypothesis of no long-run relationship. Hence the bound test till us that there is a long-run relationship in our model.

Table 5-6: Results of Error Correction Model (ECM) through ARDL

Short-Run Coefficient of Cointegration of ARDL: Dependent Variable: lnY			
Variable	Coefficient	Std. Error	t-Statistic
D(lnY(-1))	0.342	0.227	1.506
D(lnY(-2))	0.418	0.256	1.634
D(lnY(-3))	0.607**	0.267	2.269
D(lnK)	0.444***	0.085	5.209
D(lnK(-1))	0.128	0.154	0.832
D(lnK(-2))	-0.057	0.162	-0.353
D(lnK(-3))	-0.579***	0.151	-3.826
D(lnH)	-9.655***	1.916	-5.037
D(lnH(-1))	-0.224	4.003	-0.056
D(lnH(-2))	3.443	4.358	0.790
D(lnH(-3))	-4.818	2.872	-1.677
D(lnL)	0.204	0.205	0.996
D(lnL(-1))	-0.107	0.235	-0.455
D(lnL(-2))	-0.557**	0.250	-2.227
D(lnL(-3))	0.451**	0.187	2.405
D(lnImp)	-0.132*	0.067	-1.957
D(lnImp(-1))	0.308***	0.089	3.460
D(lnImp(-2))	0.109*	0.058	1.852
D(lnExp)	-0.032	0.071	-0.447
D(lnExp(-1))	-0.104	0.066	-1.574
D(lnExp(-2))	-0.131*	0.064	-2.022
(ECT)	-0.812***	0.154	-5.246
Note: (*), (**) and (***) are showing significance level at 1%,5% and 10% respectively.			

The value of error correction term (ECT) in Table 5.6 is negative and significant, which shows the speed of adjustment toward long-run equilibrium state. It also shows the long-

run causality running from independent variables to dependent variables. The long-run relationships are shown in Table 5.7.

Table 5-7: Long-run Relationship between Aggregate Foreign Trade and Economic Growth

Long-Run Coefficients of ARDL: Dependent Variable: lnY				
Variable Name	Variable	Coefficient	Std. Error	t-Statistic
Physical capital	lnK	1.391***	0.173	8.005655
Human capital	lnH	4.341***	0.460	9.428409
Labor Force	lnL	-0.048	0.189	-0.254579
Imports	lnImp	-0.854***	0.157	-5.441068
Exports	lnExp	0.103*	0.057	1.810423
C	Constant	-0.327	2.368	-0.138454

R-squared	0.999	Mean dependent var	28.01268
Adjusted R-squared	0.999	S.D. dependent var	1.616838
S.E. of regression	0.019	Akaike info criterion	-4.802886
Sum squared residuals	0.004	Schwarz criterion	-3.620671
Log likelihood	124.0577	Hannan-Quinn criterion	-4.375435
F-statistic	9560.679	Durbin-Watson stat	2.329342
Probability(F-statistic)	0.000000		

Cointegrating equation = lnY - (1.3916lnK + 4.3413lnH - 0.0484lnL - 0.854 lnImp + 0.1036lnExp -0.3279)

Note: (*), (**) and (***) are showing significance level at 1%,5% and 10% respectively.

In Table 5.7 the dependent variable is economic growth (Y) and the explinatory variables are physical capital, human capital, labor force, exports and imports. The three variables namely, physical capital, human capital, and exports have a positive and significant impact on economic growth which is consistent with the results of Johansen cointegration test given in Table 5.3 and DOLS in Table 5.4. Similarly, our results support other studies like Mehmood (2013) and Enue et al. (2013).

Serial Correlation

Serial correlation arise in time series data when error terms are correlated with one another in different time periods. It is basically the violation of the classical linear regression model assumption which is cov (μ_t, μ_{t-1}) = 0.The classical linear model assumption shows that the error terms are not correlated. This assumption is violated due to misspecification, omitted variables and measurement errors. We use Breusch-Godfrey serial correlation LM test to detect serial correlation. The dependence of current year error term on last period's error term is shown in the equation form as below,

$$\mu_t = \rho\, \mu_{t-1} + \epsilon_t$$

Serial Correlation LM Test for Aggregate Foreign Trade and Economic Growth:

Null Hypothesis: $\rho = 0$ (No serial correlation exist).

Alternative Hypothesis: $\rho \neq 0$ (There is serial correlation).

The results are reported in Table 5.8.

Table 5-8: Results of Serial Correlation LM Test

Breusch-Godfrey (BG) Serial Correlation LM Test:			
F-statistic	0.546945	Probability. F(2,10)	0.5951
Observed R-squared	3.944117	Probability. Chi-Square(2)	0.1392

Table 5.8 shows that the p value is greater than 5 % of both F-statistic and observed R-squared, so, we accept the null hypothesis of no serial correlation in our model.

Heteroskedasticity Test

Heteroskedasticity lead us to biased and misleading estimates. This problem occur due to inconsistent error terms and high fluctuation in the residuals distribution. We employ Breusch-Pagan-Godfrey test to detect this issue.

Breusch-Pagan-Godfrey (BPG) Test for Aggregate Foreign Trade and Economic Growth:

The test for aggregate foreign trade and economic growth is given below in the axulary regression formand the results are reported in Table 5.9.

$$\delta_t^2 = \hat{\mu}_t = \alpha_1 + \alpha_2 \ln Exp_t + \alpha_3 \ln Imp_t + \alpha_4 \ln L_t K_t + \alpha_5 \ln H_t + \alpha_6 \ln L_t$$

Null Hypothesis: $\alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = 0$ ($\delta_t^2 = \alpha_1 = \text{constant}$).

Alternative Hypothesis: At least one of them $\neq 0$.

Table 5-9: Results of Breusch-Pagan-Godfrey (BPG) Test for Heteroskedasticity

Heteroskedasticity Test: (Breusch-Pagan-Godfrey)			
F-statistic	2.738151	Prob. F(27,12)	0.0350
Observed R-squared	34.41406	Prob. Chi-Square(27)	0.1543
Scaled explained SS	3.268074	Prob. Chi-Square(27)	1.0000

From Table 5.9 it is concluded that there is no heteroskedasticity problem in our model because the p value against observe R-squared is greater than 5 %. Additionally, the scaled explained SS value is also insignificant which shows that our model is free from heteroskedasticity problem and the variance of the variables and random term is constant.

Stability Tests for Aggregate Foreign Trade and Economic Growth.

To check whether our parameters are stable or not, we use the cumulative sum test (CUSUM) which shows that the parameters are changing systematically. In addition, we use cumulative sum of square, which shows that the coefficients of our regression analysis are changing suddenly.

Cumulative Sum Test (CUSUM).

Null hypothesis: Parameters are stable.

Alternative hypothesis: Parameters are not stable.

Figure 5-1: CUSUM Test for Aggregate Foreign Trade and Economic Growth

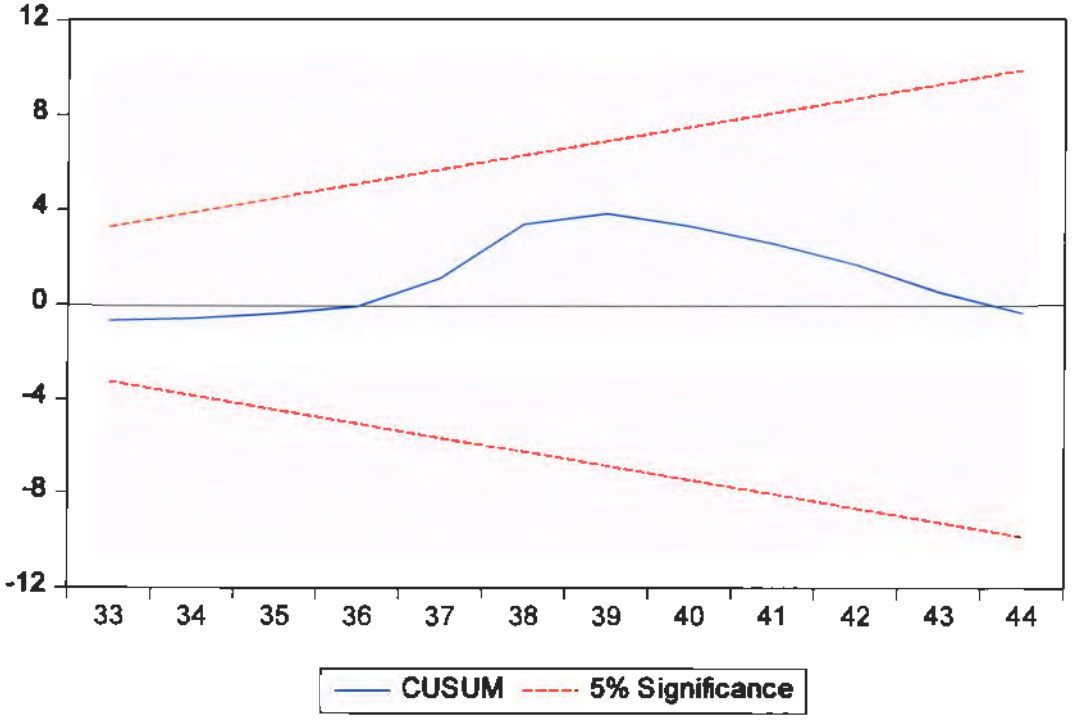


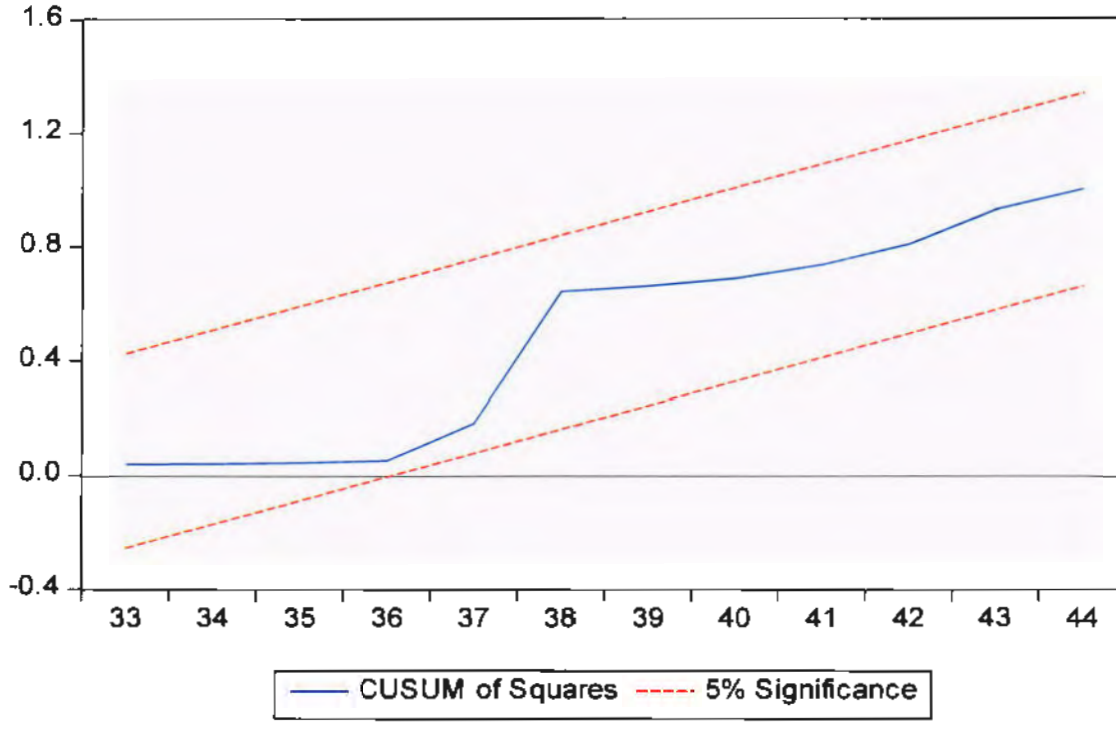
Figure 5.1 shows that the parameters are stable because the blue line does not cross the red line.

Cumulative Sum of Square (CUSUMS)

Null hypothesis: Parameters are stable.

Alternative hypothesis: Parameters are not stable.

Figure 5-2: CUSUM of Squares Test for Aggregate Foreign Trade and Economic Growth



From Figure 5.2 it is concluded that our model is stable and acceptable.

5.1.4 Comparison of Results from the three Model

We have applied three estimation techniques (DOLS, Johansen cointegration test and ARDL) to see the relationship between foreign trade and economic growth. Table 5.10 shows a brief comparison of the three model. The coefficients of physical capital and human capital are strongly significant and positive in sign. In contrast, the coefficient of labor force is positive and significant in dynamic ordinary least square (DOLS). However, its coefficient is positive and insignificant in Johansen Cointegration test, while, it is negative but insignificant in ARDL. Furthermore, the impact of imports on economic growth is negative and strongly significant in all the three models. However, the exports coefficients are positive in all the three models but the degree of significance is different.

It is therefore concluded that exports have a growth enhancing impact, while imports have a growth retarding impact.

Table 5-10: Comparison among the Three Model

Dependent Variable: lnY			
Variable	DOLS	Johansen	ARDL
lnK	1.352***	1.669***	1.391***
lnH	5.552***	5.429***	4.341***
lnL	0.588***	0.024	-0.048
lnImp	-1.093***	-1.154***	-0.854***
lnExp	0.247***	0.236**	0.103*
C	-0.285	-3.559	-0.327
Note: (*), (**) and (***) are showing significance level at 1%,5% and 10% respectively.			

5.2 Results for the Relationship of Disaggregated Foreign Trade and Economic Growth.

In this section we report the results of various tests to see the impact of disaggregated foreign trade on economic growth. The exports are divided into three categories, namely primary, semi processed and manufactured exports (final goods). Likewise, the imports are classified into two categories, namely consumer goods and capital goods imports. In addition, other determinants of economic growth like physical and human capital as well as labor force operate in the analysis as before. We follow the same methodology and use the three estimation techniques, namely the Johansen Cointegration, Dynamic least square

and ARDL. Before going to discuss the results of the three techniques, we check the problems of auto correlation and heteroskedasticity.

5.2.1: Johansen Cointegration Test

We apply the Johansen cointegration test to the data at hand. The results are reported below. The results of Unrestricted Cointegration Rank Test (Trace) in Table 5.11 reject the null hypothesis of no cointegration and accept the null hypothesis of 8 cointegration equations. The results confirm the long-run relationship among the variables.

Table 5-11: Unrestricted Cointegration Rank Test (Trace) for Disaggregated Foreign Trade and Economic Growth

Unrestricted Cointegration Rank Test (Trace)			
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value (0.05)
None *	0.951***	427.449	197.370
At most 1 *	0.866***	302.974	159.529
At most 2 *	0.855***	220.396	125.615
At most 3 *	0.687***	141.109	95.753
At most 4 *	0.496***	93.391	69.818
At most 5 *	0.457***	65.267	47.856
At most 6 *	0.406***	40.184	29.797
At most 7 *	0.355***	18.783	15.494
At most 8	0.019	0.804	3.841
Trace test shows 8 cointegrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values.			

Table 5-12: Unrestricted Cointegration Rank (Maximum Eigenvalue) Test for Disaggregate Foreign Trade and Economic Growth

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value
None *	0.951***	124.474	58.433
At most 1 *	0.866***	82.578	52.362
At most 2 *	0.855***	79.286	46.231
At most 3 *	0.687***	47.718	40.077
At most 4	0.496	28.123	33.876
At most 5	0.457	25.082	27.584
At most 6 *	0.406**	21.400	21.131
At most 7 *	0.355**	17.979	14.264
At most 8	0.019	0.804	3.841
Max-eigenvalue test directs 4 cointegrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug Michelis (1999) p-values.			

In addition, to trace test we have applied maximum eigenvalue test reported in Table 5.12, which indicate four cointegrating equations. From both of the tests, trace test and maximum eigenvalue test we have concluded that there is a long-run relationship among the variables.

Table 5-13: Normalized Form of Johansen Cointegration Test

Normalized cointegrating coefficients (standard error in parentheses)								
Dependent Variable: lnY								
	lnK	lnH	lnL	lnPRExp	lnSPExp	lnMNExp	lnCNImp	lnCPImp
lnY	0.141***	3.596***	0.385***	-0.054**	0.020	0.572***	0.305***	-0.338***
	(0.033)	(0.188)	(0.063)	(0.019)	(0.014)	(0.037)	(0.031)	(0.016)
Note: (***), (**) and (*) symbolize 1%,5% and 10% level of significance respectively.								

Table 5.13 shows the normalized long-run cointegrating coefficients of the Johansen test. These results reveal that Pakistan economic growth increases by 0.02 % in response to 1 % increase in semi processed exports. Similarly, 1 % increase in manufacturing exports leads to a 0.572 % increase in economic growth. In contrast, economic growth decreases by 0.054 % in response to 1 % increase in primary exports. As before, capital goods import have a significant negative impact on economic growth. 1 % increase in capital goods import leads to a 0.338 % decrease in economic growth. However, economic growth increases by 0.305 % in response to 1 % increase in consumer goods import. Furthermore, physical capital, human capital and labor force have a positive and significant impact on economic growth. Consequently, semi processed exports, manufacturing exports and consumer goods imports have a growth enhancing impact. The impact of manufacturing exports on growth is higher than others. In contrast, primary exports and capital goods imports have adverse impact on economic growth.

5.2.2 Dynamic Least Squares (DOLS) Technique

To see the impact of disaggregated foreign trade on economic growth of Pakistan, we have applied DOLS and the results are shown below:

Table 5-14: Disaggregated Foreign Trade and Economic Growth

Dependent Variable: lnY			
Variable	Coefficient	Std. Error	t-Statistic
lnK	0.233**	0.104	2.237
lnH	3.198***	0.891	3.588
lnL	0.298	0.334	0.890
lnPRExp	0.032	0.074	0.427
lnSPExp	0.082	0.060	1.349
lnMNExp	0.311*	0.147	2.114
lnCNImp	0.294**	0.119	2.462
lnCPImp	-0.324***	0.085	-3.805
R-squared	0.958	Mean dependent var	0.147
Adjusted R-squared	0.799	S.D. dependent var	0.051
S.E. of regression	0.022	Sum squared resid	0.004
Long-run variance	0.000		
Note: (***),(**),(*) represent 1%,5% and 10% level of significance respectively.			

Table 5.14 shows the impact of disaggregated foreign trade on economic growth of Pakistan. The impact of primary exports and semi processed exports is positive but insignificant. However, the manufactured exports do influence economic growth positively and significantly. Likewise, the imports of consumer goods have a significant and positive impact on economic growth. In contrast, capital goods imports have a negative and highly significant impact on economic growth.

5.2.3 Disaggregate Foreign Trade and Economic Growth: Auto Distributed Lag (ARDL) Model

To show the impact of disaggregated foreign trade on economic growth, we have used the same techniques as used for aggregate foreign trade and economic growth. The results of short and long-run relationships are reported in Table 5.15. 5.16 and 5.17 below.

Table 5-15: ARDL Bounds Test Results

Test Statistic	Value	
F-statistic	4.292	
Critical Value Bounds		
Significance	I(0) (Lower Bound)	I(1) (Upper Bound)
10%	1.95	3.06
5%	2.22	3.39
2.5%	2.48	3.7
1%	2.79	4.1

From Table 5.15 it is concluded that the F-statistic value 4.292 lies above the upper bounds value 3.39 at five percent level. So, we reject the null hypothesis of no long-run relationship and accept the alternative hypothesis of long-run relationship among the variables. Bound test tells the long-run relationship among the variables irrespective of whether the variables are I(1) or I(0). Moreover, ARDL test gives robust results compare to granger causality and Johansen cointegration test.

Table 5-16: ARDL Short-Run Cointegration Form of Disaggregate Foreign Trade and Economic Growth

Cointegrating Form: Dependent Variable: LnY			
Variable	Coefficient	Std. Error	t-Statistic
D(lnK)	0.352***	0.059	5.941
D(lnH)	-5.644***	1.642	-3.436
D(lnL)	-0.009	0.116	-0.081
D(lnPRExp)	0.063**	0.024	2.597
D(lnSPExp)	0.048**	0.021	2.295
D(lnMNExp)	-0.059	0.045	-1.302
D(lnMNExp(-1))	-0.058	0.038	-1.508
D(lnCNImp)	0.062	0.042	1.483
D(lnCPImp)	-0.090**	0.036	-2.463
D(lnCPImp(-1))	0.082**	0.040	2.067
ECT	-0.465***	0.085	-5.426
Note: (*), (**) and (***) are showing significance level at 1%,5% and 10% respectively.			

The ARDL results in Table 5.16 show short-run impact of the variables. Hence the value of error correction term is negative and significant which shows that our model adjust any disequilibrium at speed 0.465 toward long-run equilibrium. While, primary exports and semi processed exports have positive impact on economic growth in the short-run. The manufactured exports negatively affect economic growth in short-run. Moreover, capital goods import have a positive impact in short run.

Table 5-17: Long-Run Relationship between Disaggregates Foreign Trade and Economic Growth

Long-Run Coefficients of ARDL: Dependent variable: lnY				
Variable Name	Acronyms	Coefficient	Std. Error	t-Statistic
Physical capital	lnK	0.526***	0.111	4.719
Human capital	lnH	2.369***	0.580	4.084
Labor force	lnL	-0.020	0.251	-0.081
Primary exports	lnPRExp	0.135***	0.054	2.495
Semi processed exports	lnSPExp	0.020	0.049	0.424
Manufactured exports	lnMNExp	0.366***	0.099	3.673
Consumer goods imports	lnCNImp	0.134	0.084	1.595
Capital goods imports	lnCPImp	-0.429***	0.087	-4.916
Constant	C	11.010***	1.730	6.361
R-squared		0.999	Mean dependent var	27.860
Adjusted R-squared		0.999	S.D. dependent var	1.720
S.E. of regression		0.021	Akaike info criterion	-4.506
Sum squared resid		0.012	Schwarz criterion	-3.802
Log likelihood		111.626	Hannan-Quinn criter.	-4.248
F-statistic		15692.95	Durbin-Watson stat	2.297
Prob(F-statistic)		0.000		
Note: (*), (**) and (***) are showing significance level at 1%,5% and 10% respectively.				
Cointegrating equation = lnY - (0.5266lnK + 2.3699lnH -0.0204lnL + 0.1355lnPRExp + 0.0210lnSPExp + 0.3669lnMNExp + 0.1346lnCNImp -0.4299lnCPImp + 11.0100)				

Table 5.17 shows long-run results of ARDL model. Primary exports and manufactured exports have positive and highly significant impact on economic growth, however, the impact of manufactured exports is stronger then primary exports. Moreover, semi processed exports have positive but insignificant impact on economic growth. Furthermore, consumer goods imports have positive but insignificant impact on economic growth. In contrast, capital goods imports have adverse and highly significant impact on economic growth.

The R-squared value is 0.99 which shows that 99 % variation in the independent variables have explained in our model. So our model is acceptable because the value of R-squared is greater than 60 %. Moreover, the F statistic value is significant which also shows that our model is significant and desirable.

Serial test for Disaggregated foreign Trade and Economic Growth

Null Hypothesis: $\rho = 0$ (No serial correlation exist).

Alternative Hypothesis: $\rho \neq 0$ (There is serial correlation).

The results are reported in Table 5.18.

Table 5-18: Results of Serial Correlation LM Test

Breusch-Godfrey (BG) Serial Correlation LM Test:			
F-statistic	0.821	Prob. F(1,24)	0.373
Observed R-squared	1.390	Prob. Chi-Square(1)	0.238

The results obtained from Breusch-Godfrey (BG) Serial Correlation LM Test in Table 5.18 does not show any sign of serial, Auto or spurious correlation. Moreover, the value of F-

statistic and the observed R-squared is insignificant which indicate the acceptance of null hypothesis of no serial correlation exist. Further, it is also concluded that the error terms are independent from one another.

Breusch-Pagan-Godfrey (BPG) Test for Disaggregate Foreign Trade and Economic Growth

The test for disaggregated foreign trade and economic growth is given below in the axulary regression form and the results are reported in Table 5.19.

$$\delta_t^2 = \dot{\varepsilon}_t = \beta_1 + \beta_2 \ln PRExp_t + \beta_3 \ln SPExp_t + \beta_4 \ln MNExp_t + \beta_5 \ln CNImp_t + \beta_6 \ln CPImp_t + \beta_7 \ln K_t + \beta_8 \ln H_t + \beta_9 \ln L_t$$

Null Hypothesis: $\beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = 0$

$(\delta_t^2 = \beta_1 = \text{constant})$.

Alternative Hypothesis: At least one of them $\neq 0$.

Table 5-19: Bresuch-Pagan-Godfrey (BPG) Test for Hetroskedasticity

Heteroskedasticity Test: (Breusch-Pagan-Godfrey)			
F-statistic	1.311	Prob. F(16,25)	0.264
Observed R-squared	19.165	Prob. Chi-Square(16)	0.260
Scaled explained SS	4.640	Prob. Chi-Square(16)	0.997

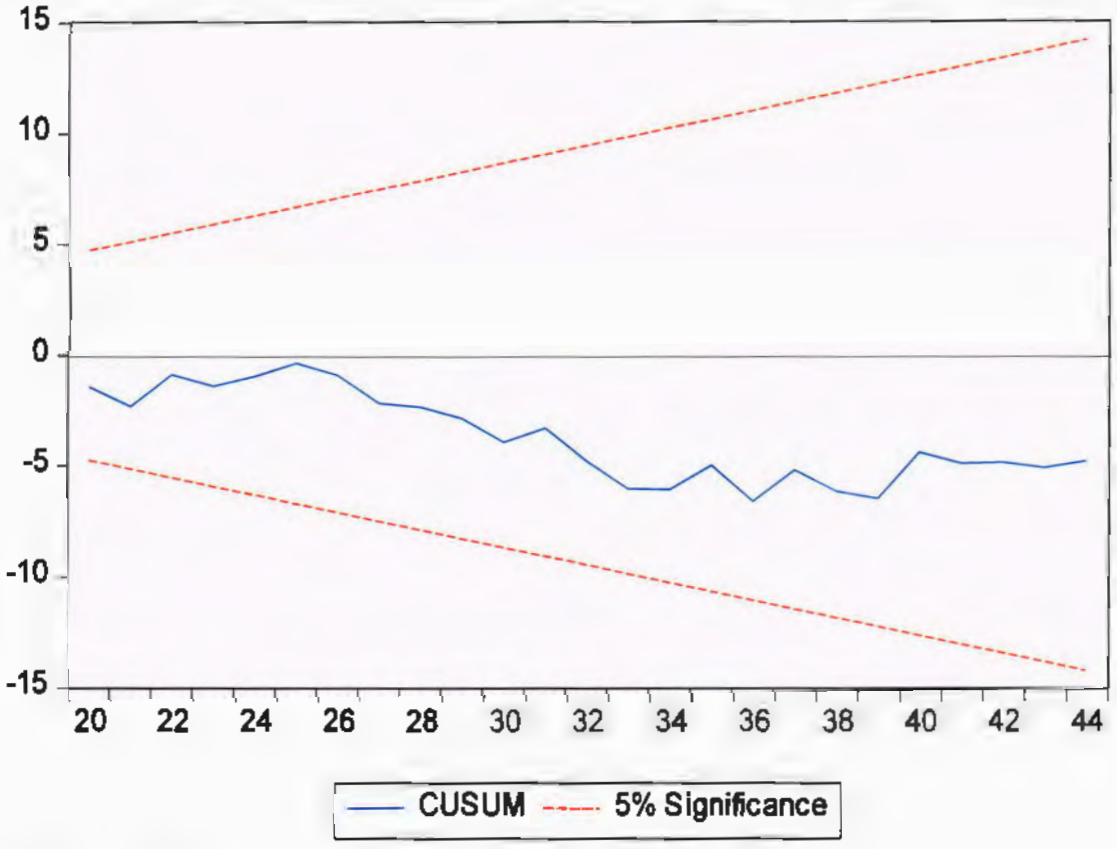
Table 5.19 contains three test to check the heteroskedasticity problem in the model. The values of all the three tests such as F-statistic, Observed R-squared and Scaled explained SS test are insignificant and leads to homoscedasticity rather than heteroskedasticity.

Cumulative Sum Test (CUSUM).

Null hypothesis: Parameters are stable.

Alternative hypothesis: Parameters are not stable.

Figure 5-3: CUSUM Test for Disaggregate Foreign Trade and Economic Growth

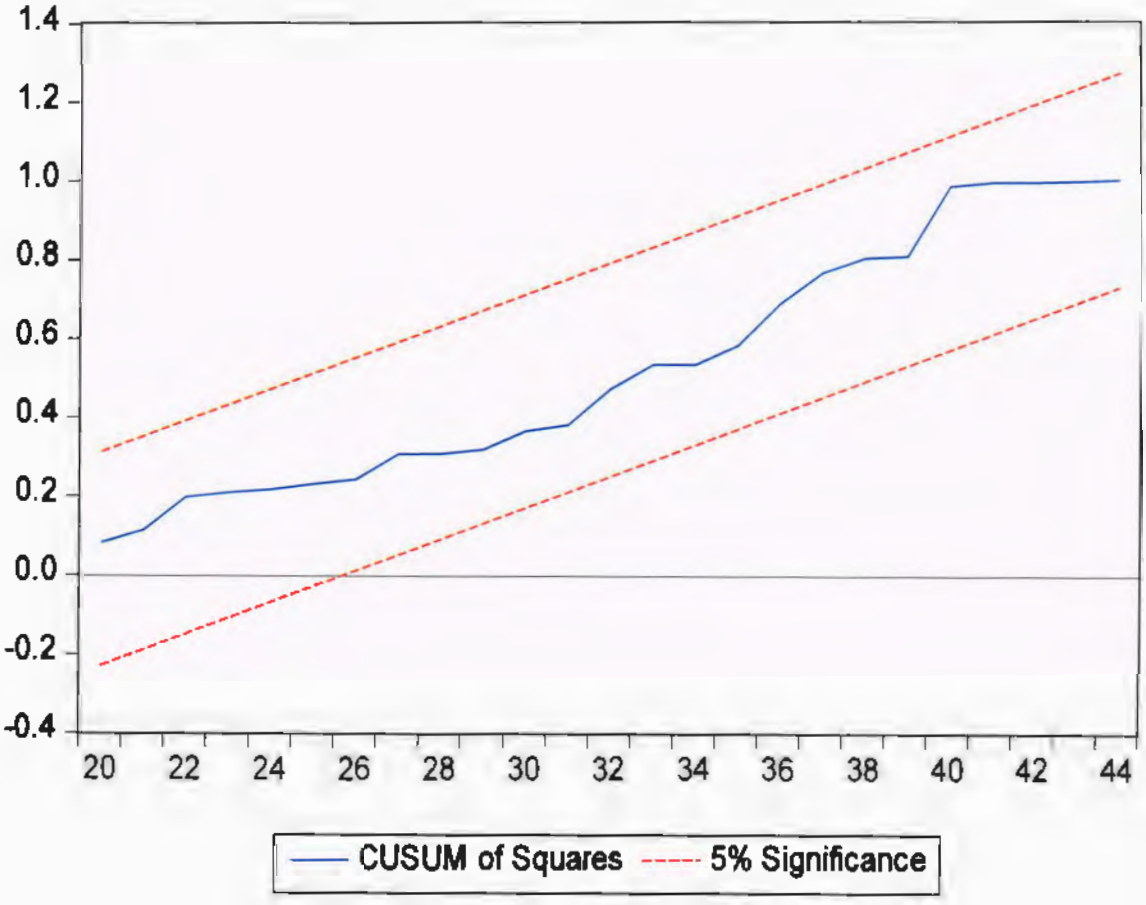


Cumulative Sum Test (CUSUM).

Null hypothesis: Parameters are stable.

Alternative hypothesis: Parameters are not stable.

Figure 5-4: CUSUM of Squares Test for Disaggregate Foreign Trade and Economic Growth



To check the stability of our model we use the cumulative sum (CUSM) and the cumulative sum of square (CUSUMSQ) tests. Figure 5.3 and 5.4 plot the results, which indicate that the model is stable and acceptable. Another words, we accept the null hypothesis of that our parameters are stable because the plot ofthe CUSUM and CUSUMSQ tests are inside of the confidence interval of the critical bands at 5 %.

5.2.4 Disaggregated Foreign Trade and Economic Growth Comparative position

Table 5.20 summarizes and compares the results of the three models. It is evident that physical capital and human capital are crucial for economic growth of Pakistan. They have positive and highly significant coefficients measured under the three standard techniques. However, labor force has negative impact on economic growth. Furthermore, impact of primary exports is changing due to change in estimation methodology. The results of primary exports in DOLS show positive but insignificant impact on economic growth, while it is negative and significant in Johansen Cointegration test. In contrast, it is positive and significant in ARDL model. Due to inconsistency in results, we prefer the results of ARDL model because it gives unbiased and efficient results and it also fix the autocorrelation in the model. Pakistan economy is basically an agrarian economy which is supported by the industrial sector up to some extent. However, most of its exports are composed of food items and raw material instead of finished or manufactured goods. These good have low price in foreign competitive markets.

The semi processed exports have a positive but insignificant impact on economic growth in all the three models. The results of semi processed exports are consistent with each other. In comparison, manufacturing exports are the growth propellants which produce externalities and knowledge spillover effects for other sectors. The growth of manufacturing sector increases the productivity of labor through learning by doing. These exports are the basic tools of foreign exchange earnings, which further leads to more investment, high employment and greater production. The results of manufactured exports from the three models are positive and significant. It can be concluded that manufactured exports have a key role in export-led growth hypothesis.

Pakistan imports capital goods, which are highly expensive and responsible for a huge trade deficit every year. Moreover, it is necessary that a country has enough technological capabilities and skilled labor to successfully adapt new technology from foreign R & D intensive countries. Due to lack of skilled labor force, inconsistent government policies, high cost of production and severe energy shortages in Pakistan, the capital goods imports adversely affect economic growth. In contrast, the imports of consumer goods have positive impact on economic growth. The imports of consumer goods increase domestic savings because they are less expensive as compare to domestic production. This leads to high investment and increase in production of capital goods increase per worker income.

Table 5-20: Comparison among Dynamic OLS, Johansen Cointegratin Test and Autoregressive Distributive Lag (ARDL) for Disaggregate Foreign Trade and Economic Growth

Dependent Variable: lnY			
Variable	DOLS	Johansen test	ARDL
lnK	0.233**	0.141***	0.526***
lnH	3.198***	3.596***	2.369***
lnL	0.298	-0.385***	-0.020
lnPRExp	0.032	-0.054**	0.135***
lnSPExp	0.082	0.020	0.020
lnMNExp	0.311*	0.572***	0.366***
lnCNImp	0.294**	0.305***	0.134
lnCPImp	-0.324***	-0.338**	-0.429***
Note (***),(**),(*) represent 1%,5% and 10% level of significance respectively			

Chapter 6

Conclusion and Policy Recommendations.

This chapter is divided into three sections. In the first section, we discuss a brief conclusion of the whole thesis. Second section consists of some recommendation for policy makers. In the third section, we highlight future research prospects in this area.

6.1 Summary and Conclusion

Economic growth has a crucial role in the history of development of countries. There are several determinants like physical capital, human capital, labor force etc which affect the rate of economic growth and one of the important determinant is foreign trade as it plays a key role in the development of the economy. Foreign trade is a system through which countries exchange their goods and services. Countries sell their surplus goods and services in foreign markets and buy goods and services that are less expensive, better in quality, or simply different in attributes from what is domestically produced. Foreign trade is divided into two main components like exports and imports. A huge literature is available on exports, imports and economic growth nexus. However, their impact on economic growth is different for different countries.

Exports are disaggregated into primary, semi processed and manufactured/final goods. While imports are divided into consumer goods and capital goods. As evident from the literature there are very few studies showing the nexus between disaggregated foreign trade and economic growth. However, there is no study showing such a nexus in case of Pakistan. This study has tried to investigate the impact of foreign trade (exports plus imports), both

aggregate and disaggregate levels (primary exports, semi processed exports, manufactured exports, consumer goods imports and capital goods imports) on the economic growth of Pakistan. For this purpose, we have used time series data from 1970 to 2014.

We have followed the augmented version of the neo classical growth model due to Mankiw et al. (1990). After constructing the theoretical models for foreign trade and economic growth, we have checked the data for stationarity by using Augmented Dickey-Fuller (1997) test and Phillips-Perron (1988) test. After confirming that all data are stationary at first difference I(1), we have used different econometric techniques like Johansen (1995) cointegration test, dynamic OLS suggested by Saikkonen (1991) and auto regressive distributed lag model proposed by Pesaran, Shin and Smith (2001)

The results of our first model for aggregate foreign trade and economic growth show that exports enhance economic growth. The results obtained from all the three techniques (Johansen, DOLS and ARDL) for exports are positive and significant. These results are similar to the studies of Mehmood (2013), Quddus and Saeed (2005), Dutt and Ghosh (1996). However, the impact of imports in all the three techniques is negative and highly significant, which show that increase in imports leads to decrease economic growth. These results support the studies of Tahir et al. (2015), Chaudhary and Qaisrani (2002), Rashid et al. (2012) and Enu et al. (2013). Therefore it is concluded that export led growth hypothesis is valid for Pakistan, while import led growth hypothesis is inappropriate.

The results of our second model for disaggregate foreign trade and economic growth show different impacts in our three econometric techniques. The results for physical capital, human capital, semi processed exports, manufactured exports and capital goods imports

are consistent with one another in the three techniques. However, labore force, primary exports and consumer goods import are inconsistent with one another. Moreover, primary exports and manufactured exports have positive and highly significant impact on economic growth but the impact of manufactured exports is stronger than primary exports in the ARDL model. However, semi processed exports have positive but insignificant inpact on economic growth. Furthermore, consumer goods imports have positive but insignificant impact on economic growth while capital goods imports have negative and highly significant impact on economic growth throughout the three models which support the study by Mazol (2016).

6.2 Policy Recommendations

Our study recommends the following policy measures on the basis of our analysis and results.

1. **Exports expansion and diversification:** Exports have a positive impact on economic growth. So to avoid deficit in balance of payment it is necessary to boosted up exports as well as improvement in the quality of exports. Moreover, both commodities wise and market wise diversification is necessary for stable exports. Furthermore, trade promotion infrastructure can be strengthened and productivity and skilled labor can be increase through investment on the research and development related activities. Additionally, continuity and consistency are required in policies.
2. **Expansion of Manufactured exports:** Manufactured exports enhance economic growth. The production of manufactured goods increase income of per worker and enhance productivity through learning by doing and knowledge spillover effect. It

is necessary to provide skilled labor and easy access to foreign markets. Furthermore, to overcome the energy crises and subsidies to this sector can increase the efficiency of the manufactured sector. In addition commercial links with other countries can increase the efficiency of the sector.

3. **Imports constraint:** Imports have negative impact on economic growth of Pakistan. So, before importing from abroad it is necessary to have skilled human labor and enough domestic technology which can adapt new technology from research and development intensive countries easily. Moreover, our industries cannot compete with the industries of developed countries, therefore a well specified and stable commercial policy is needed to protect our infant industries.
4. **Improvement in term of trade:** The value of currency should be stabilize for improvement in exports prices and controlling the imports prices. Moreover, providing incentives in export sector rather then import sector can enhance economic growth.

6.3 Future Research

Future research can be done in this area in the following directions.

- A comparative study of developing and developed countries is required to examine the differences and implications of international trade.
- A disaggregated study is required in countries where human capital is low.
- There is a need to incorporate the services sector into the literature of international trade and growth.

References

A. Giles, J., & Williams, C. L. (2000). Export-led growth: a survey of the empirical literature and some non-causality results. Part 1. *The Journal of International Trade & Economic Development, 9*(3), 261-337.

Abbas, S. (2012). Causality between exports and economic growth: Investigating suitable trade policy for Pakistan. *Eurasian Journal of Business and Economics, 5*(10), 91-98.

Akbar, M., Naqvi, Z. F., & Din, M.-u. (2000). Export Diversification and the Structural Dynamics in the Growth Process: The Case of Pakistan [with Comments]. *The Pakistan Development Review*, 573-589.

Al-Yousif, Y. K. (1997). Exports and economic growth: Some empirical evidence from the Arab Gulf countries. *Applied Economics, 29*(6), 693-697.

Alam, H. M. (2011). An econometric analysis of export-led growth hypothesis: reflections from Pakistan. *Interdisciplinary Journal of Contemporary Research in Business, 2*(12), 329.

Alam, J. N., Abbasi, G., & Baseri, B. (2014). Relationship between exports and economic growth in the industrial sector in Iran. *Kuwait Chapter of the Arabian Journal of Business and Management Review, 3*(8), 105.

Amiri, A., & Gerdtham, U.-G. (2011). Relationship between exports, imports, and economic growth in France: evidence from cointegration analysis and Granger causality with using geostatistical models.

Arize, A. C. (2002). Imports and exports in 50 countries: tests of cointegration and structural breaks. *International Review of Economics & Finance, 11*(1), 101-115.

Atique, Z., Ahmad, M. H., Azhar, U., & Khan, A. H. (2004). The Impact of FDI on Economic Growth under Foreign Trade Regimes: A Case Study of Pakistan [with Comments]. *The Pakistan Development Review*, 707-718.

Atique, Z., Ahmad, M. H., & Zaman, A. (2003). The Supply and Demand for Exports of Pakistan: The Polynomial Distributed Lag Model (PDL) Approach [with Comments]. *The Pakistan Development Review*, 961-972.

Awokuse, T. O. (2007). Causality between exports, imports, and economic growth: Evidence from transition economies. *Economics Letters, 94*(3), 389-395.

Bahmani-Oskooee, M., Mohtadi, H., & Shabsigh, G. (1991). Exports, growth and causality in LDCs: A re-examination. *Journal of Development Economics, 36*(2), 405-415.

Balassa, B. (1985). Exports, policy choices, and economic growth in developing countries after the 1973 oil shock. *Journal of Development Economics, 18*(1), 23-35.

Bbaale, E., & Mutenyo, J. (2011). Export composition and economic growth in Sub-Saharan Africa: a panel analysis. *Consilience: The Journal of Sustainable Development, 6*(1), 1-19.

Chambers, E. J., & Gordon, D. F. (1966). Primary products and economic growth: An empirical measurement. *The Journal of Political Economy*, 315-332.

Chandran, V. (2009). Trade openness and manufacturing growth in Malaysia. *Journal of Policy Modeling, 31*(5), 637-647.

Chaudhary, M. A., & Qaisrani, A. A. (2002). Trade instability, investment and economic growth in Pakistan. *Pakistan economic and social review*, 57-73.

Chaudhry, A., & Bukhari, S. K. H. (2013). A structural VAR analysis of the impact of macroeconomic shocks on Pakistan's textile exports. *Economic Modelling, 32*, 302-315.

Dao, M. Q. (2014). Exports, imports, government consumption and economic growth in upper-middle income countries. *Progress in Development Studies, 14*(2), 197-204.

De la Torre, A., Didier, T., & Pinat, M. (2014). Can Latin America tap the globalization upside? *World Bank Policy Research Working Paper*(6837).

Demetriades, P., Al-Jebory, A., & Kamperis, G. (1993). Manufacturing exports, economic growth and the current account in a small island economy: simulation results from an econometric model for Cyprus. *World Development, 21*(2), 259-268.

Didier, T., & Pinat, M. (2013). How Does Trade Cause Growth?

Din, M.-u. (2004). Exports, imports, and economic growth in South Asia: Evidence using a multivariate time-series framework. *The Pakistan Development Review*, 105-124.

Dritsaki, C., & Stiakakis, E. (2014). Foreign direct investments, exports, and economic growth in Croatia: A time series analysis. *Procedia Economics and Finance, 14*, 181-190.

Eaton, J., & Kortum, S. (2001). Trade in capital goods. *European Economic Review, 45*(7), 1195-1235.

Ee, C. Y. (2016). Export-led Growth Hypothesis: Empirical Evidence from Selected Sub-saharan African Countries. *Procedia Economics and Finance, 35*, 232-240.

El-Sakka, M. I., & Al-Mutairi, N. H. (2000). Exports and economic growth: the Arab experience. *The Pakistan Development Review*, 153-169.

Enu, P., & Attah-Obeng, P. (2013). WHICH MACRO FACTORS INFLUENCE AGRICULTURAL PRODUCTION IN GHANA? *Academic Research International, 4*(5), 333.

Esfahani, H. S. (1991). Exports, imports, and economic growth in semi-industrialized countries. *Journal of Development Economics, 35*(1), 93-116.

Faridi, M. Z. (2012). Contribution of Agricultural Exports to Economic Growth in Pakistan. *Pakistan Journal of Commerce & Social Sciences, 6*(1).

Fosu, A. K. (1990). Export composition and the impact of exports on economic growth of developing economies. *Economics Letters, 34*(1), 67-71.

Franco, C., & Sasidharan, S. (2010). MNEs, technological efforts and channels of export spillover: An analysis of Indian manufacturing industries. *Economic Systems, 34*(3), 270-288. doi: 10.1016/j.ecosys.2010.02.005

Ghatak, S., & Price, S. W. (1997). Export composition and economic growth: Cointegration and causality evidence for India. *Review of World Economics, 133*(3), 538-553.

Ghosh, D. (1996). The export growth-economic growth nexus: a causality analysis. *The Journal of Developing Areas, 30*(2), 167-182.

Giles, J. A., & Williams, C. L. (2000). Export-led growth: a survey of the empirical literature and some non-causality results. Part 2. *Journal of International Trade & Economic Development, 9*(4), 445-470.

Gokmenoglu, K. K., Amin, M. Y., & Taspinar, N. (2015). The relationship among international trade, financial development and economic growth: The case of Pakistan. *Procedia Economics and Finance, 25*, 489-496.

Goldberg, P. K., Khandelwal, A., Pavcnik, N., & Topalova, P. (2008). Imported intermediate inputs and domestic product growth: Evidence from India: National Bureau of Economic Research.

Grossman, G. M., & Helpman, E. (1991). Quality ladders in the theory of growth. *The Review of Economic Studies, 58*(1), 43-61.

Gylfason, T. (1999). Exports, inflation and growth. *World Development, 27*(6), 1031-1057.

Hameed, A., Chaudhary, M. A., Khan, K. Y., & Hasan, L. (2005). The Growth Impact of Exports in South Asian Countries [with Comments]. *The Pakistan Development Review*, 901-919.

Hatemi-J, A. (2002). Export performance and economic growth nexus in Japan: a bootstrap approach. *Japan and the World Economy, 14*(1), 25-33.

Henriques, I., & Sadorsky, P. (1996). Export-led growth or growth-driven exports? The Canadian case. *Canadian journal of Economics*, 540-555.

Herrerias, M. J., & Orts, V. (2011). Imports and growth in China. *Economic Modelling, 28*(6), 2811-2819.

Herrerias, M. J., & Orts, V. (2013). Capital goods imports and long-run growth: Is the Chinese experience relevant to developing countries? *Journal of Policy Modeling, 35*(5), 781-797.

Herzer, D., NOWAK-LEHMANN D, F., & Siliverstovs, B. (2006). EXPORT-LED GROWTH IN CHILE: ASSESSING THE ROLE OF EXPORT COMPOSITION IN PRODUCTIVITY GROWTH. *The Developing Economies, 44*(3), 306-328.

Hussain, F. (2010). Pakistan's Exports Demand: A Disaggregated Analysis. *SBP Research Bulletin, 6*, 1-13.

Iwanow, T., & Kirkpatrick, C. (2009). Trade facilitation and manufactured exports: Is Africa different? *World Development, 37*(6), 1039-1050.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of economic dynamics and control, 12*(2), 231-254.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica: Journal of the Econometric Society*, 1551-1580.

Johansen, S. (1995). *Likelihood-based inference in cointegrated vector autoregressive models*: Oxford University Press on Demand.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and statistics, 52*(2), 169-210.

Jung, W. S., & Marshall, P. J. (1985). Exports, growth and causality in developing countries. *Journal of Development Economics, 18*(1), 1-12.

Kavoussi, R. M. (1984). Export expansion and economic growth: Further empirical evidence. *Journal of Development Economics, 14*(1), 241-250.

Khalafalla, K. Y., & Webb, A. J. (2001). Export–led growth and structural change: Evidence from Malaysia. *Applied Economics, 33*(13), 1703-1715.

Khan, A. H., Malik, A., Hasan, L., & Tahir, R. (1995). Exports, Growth and Causality: An Application of Co-integration and Error-correction Modelling [with Comments]. *The Pakistan Development Review, 34*(4), 1001-1012.

Kim, S.-I., Gopinath, M., & Kim, H. (2009). High productivity before or after exports? An empirical analysis of Korean manufacturing firms. *Journal of Asian Economics, 20*(4), 410-418.

Kónya, L. (2006). Exports and growth: Granger causality analysis on OECD countries with a panel data approach. *Economic Modelling, 23*(6), 978-992.

Lawrence, R. Z., & Weinstein, D. E. (1999). Trade and growth: import-led or export-led? Evidence from Japan and Korea: National bureau of economic research.

Mankiw, N. G., Romer, D., & Weil, D. N. (1990). A contribution to the empirics of economic growth: National Bureau of Economic Research.

Marwah, K., & Tavakoli, A. (2004). The effect of foreign capital and imports on economic growth: Further evidence from four Asian countries (1970–1998). *Journal of Asian Economics, 15*(2), 399-413.

Mazumdar, J. (2001). Imported machinery and growth in LDCs. *Journal of Development Economics, 65*(1), 209-224.

Medina-Smith, E. J., & CNUCED. (2001). *Is the export-led growth hypothesis valid for developing countries?: a case study of Costa Rica*: UN.

Montobbio, F., & Rampa, F. (2005). The impact of technology and structural change on export performance in nine developing countries. *World Development, 33*(4), 527-547.

Moschos, D. (1989). Export expansion, growth and the level of economic development: an empirical analysis. *Journal of Development Economics, 30*(1), 93-102.

Nik, H., Nasab, Z., Salmani, Y., & Shahriari, N. (2013). The relationship between financial development indicators and human capital in Iran. *Management Science Letters, 3*(4), 1261-1272.

Perron, P. (1997). Further evidence on breaking trend functions in macroeconomic variables. *Journal of econometrics, 80*(2), 355-385.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics, 16*(3), 289-326.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335-346.

Pistoresi, B., & Rinaldi, A. (2012). Exports, imports and growth: New evidence on Italy: 1863–2004. *Explorations in economic history, 49*(2), 241-254.

Quddus, M. A., Saeed, I., & Asghar, Z. (2005). An Analysis of Exports and Growth in Pakistan [with Comments]. *The Pakistan Development Review*, 921-937.

Ramos, F. F. R. (2001). Exports, imports, and economic growth in Portugal: evidence from causality and cointegration analysis. *Economic Modelling, 18*(4), 613-623.

Rashid, F., & Ullah, S. (2012). Effects of Exports Instability on Economic Growth in SAARC Region Countries. *Pak. J. Commer. Soc. Sci, 6*(1), 97-120.

Raveh, O., & Reshef, A. (2016). Capital imports composition, complementarities, and the skill premium in developing countries. *Journal of Development Economics, 118*, 183-206.

Razmi, A. (2007). Pursuing manufacturing-based export-led growth: Are developing countries increasingly crowding each other out? *Structural Change and Economic Dynamics, 18*(4), 460-482. doi: 10.1016/j.strueco.2007.06.001

Rehner, J., Baeza, S. A., & Barton, J. R. (2014). Chile's resource-based export boom and its outcomes: Regional specialization, export stability and economic growth. *Geoforum, 56*, 35-45.

Reinsel, G. C., & Ahn, S. K. (1992). Vector autoregressive models with unit roots and reduced rank structure: estimation. likelihood ratio test, and forecasting. *Journal of Time Series Analysis, 13*(4), 353-375.

Rodriguez, F., & Rodrik, D. (2001). Trade policy and economic growth: a skeptic's guide to the cross-national evidence *NBER Macroeconomics Annual 2000, Volume 15* (pp. 261-338): MIT Press.

Sahoo, A. K., Sahoo, D., & Sahu, N. C. (2014). Mining export, industrial production and economic growth: A cointegration and causality analysis for India. *Resources Policy, 42*, 27-34.

Saikkonen, P. (1991). Asymptotically efficient estimation of cointegration regressions. *Econometric theory, 7*(01), 1-21.

Sheridan, B. J. (2014). Manufacturing exports and growth: When is a developing country ready to transition from primary exports to manufacturing exports? *Journal of Macroeconomics, 42*, 1-13.

Shihab, R. A., Soufan, T., & Abdul-Khaliq, S. (2014). The Causal Relationship between Exports and Economic Growth in Jordan. *International Journal of Business and Social Science, 5*(3).

Shirazi, N. S., Manap, T. A. A., & Din, M.-u. (2004). Exports and economic growth nexus: The case of Pakistan [with comments]. *The Pakistan Development Review*, 563-581.

Siddiqui, S., Zehra, S., Majeed, S., & Butt, M. S. (2008). Export-led growth hypothesis in Pakistan: A reinvestigation using the bounds test. *Lahore Journal of Economics, 13*(2), 59-80.

Singer, H. W. (1950). The distribution of gains between investing and borrowing countries. *The American Economic Review, 40*(2), 473-485.

Sun, P., & Heshmati, A. (2010). International trade and its effects on economic growth in China.

Tahir, M., Khan, I., & Shah, A. M. (2015). Foreign Remittances, Foreign Direct Investment, Foreign Imports and Economic Growth in Pakistan: A Time Series Analysis. *Arab Economic and Business Journal, 10*(2), 82-89.

Tang, C. F., Lai, Y. W., & Ozturk, I. (2015). How stable is the export-led growth hypothesis? Evidence from Asia's Four Little Dragons. *Economic Modelling, 44*, 229-235.

Torayeh, N. M. (2011). Manufactured Exports And Economic Growth In Egypt: Cointegration And Causality Analysis. *Applied Econometrics and International Development, 11*(1).

Uğur, A. (2008). Import and economic growth in Turkey: Evidence from multivariate VAR analysis. *Journal of economics and Business, 11*(1-2), 54-75.

Veeramani, C. (2009). Impact of imported intermediate and capital goods on economic growth: A cross country analysis. *Available at SSRN 1325181*.

Appendix

Augmented Dickey Fuller (ADF) Test for Unit Root

Variables:	with intercept	Critical values				With intercept & Trend	Critical values				I®
	Level	1%	5%	10%	Prob	Level	1%	5%	10%	Prob	
GDP	-0.598	-3.592	-2.931	-2.603	0.860	-2.248	-4.186	-3.518	-3.189	0.451	I(1)
Physical Capital	-1.208	-3.592	-2.931	-2.603	0.662	-3.175	-4.192	-3.520	-3.191	0.103	I(1)
Human Capital	0.236	-3.600	-2.935	-2.605	0.971	-2.298	-4.198	-3.523	-3.192	0.425	I(1)
Labour	-2.946	-3.592	-2.931	-2.603	0.048	-1.939	-4.186	-3.518	-3.189	0.616	I(1)
Consumer Goods Imports	-2.612	-3.592	-2.931	-2.603	0.098	-4.725	-4.186	-3.518	-3.189	0.002	I(1)
Capital Goods Imports	-1.617	-3.592	-2.931	-2.603	0.465	-2.533	-4.186	-3.518	-3.189	0.311	I(1)
Imports	-1.617	-3.592	-2.931	-2.603	0.217	-3.640	-4.186	-3.518	-3.189	0.037	I(1)
Primary Exports	-1.984	-3.592	-2.931	-2.603	0.292	-4.959	-4.186	-3.518	-3.189	0.001	I(1)
Semi Processed Exports	-1.637	-3.592	-2.931	-2.603	0.455	-3.018	-4.186	-3.518	-3.189	0.139	I(1)
Manufactured Exports	-2.703	-3.592	-2.931	-2.603	0.081	-2.920	-4.186	-3.518	-3.189	0.166	I(1)
Exports	-2.748	-3.592	-2.931	-2.603	0.074	-5.288	-4.186	-3.518	-3.189	0.000	I(1)

Augmented Dickey Fuller (ADF) Test for Unit Root

Variables:	with intercept	Critical values				With intercept & Trend	Critical values				I®
	1st diff	1%	5%	10%	Prob	1st diff	1%	5%	10%	Prob	
GDP	-5.679	-3.596	-2.933	-2.604	0.000	-5.714	-4.192	-3.520	-3.191	0.000	I(0)
Physical Capital	-5.201	-3.600	-2.935	-2.605	0.000	-5.719	-4.198	-3.523	-3.192	0.000	I(0)
Human Capital	-1.840	-3.600	-2.935	-2.605	0.356	-1.843	-4.198	-3.523	-3.192	0.055	I(0)
Labour	-5.828	-3.596	-2.933	-2.604	0.000	-6.486	-4.192	-3.520	-3.191	0.000	I(0)
Consumer Goods Imports	-4.614	-3.596	-2.933	-2.604	0.000	-4.887	-4.192	-3.520	-3.191	0.001	I(0)
Capital Goods Imports	-6.177	-3.596	-2.933	-2.604	0.000	-6.643	-4.192	-3.520	-3.191	0.000	I(0)
Imports	-5.357	-3.596	-2.933	-2.604	0.000	-5.821	-4.192	-3.520	-3.191	0.000	I(0)
Primary Exports	-6.648	-3.600	-2.935	-2.605	0.000	-6.463	-4.198	-3.523	-3.192	0.000	I(0)
Semi Processed Exports	-6.538	-3.596	-2.933	-2.604	0.000	-6.498	-4.192	-3.520	-3.191	0.000	I(0)
Manufactured Exports	-5.845	-3.596	-2.933	-2.604	0.000	-8.780	-4.198	-3.523	-3.192	0.000	I(0)
Exports	-5.135	-3.596	-2.933	-2.604	0.000	-9.240	-4.198	-3.523	-3.192	0.000	I(0)

Pillips-Pirron (PP) Test for Unit Root

Variables:	with intercept	Critical values				With intercept & Trend	Critical values				I®
	Level	1%	5%	10%	Prob	Level	1%	5%	10%	Prob	
GDP	-0.677	-3.592	-2.931	-2.603	0.841	-2.187	-4.186	-3.518	-3.189	0.484	I(1)
Physical Capital	-1.515	-3.592	-2.931	-2.603	0.516	-1.637	-4.186	-3.518	-3.189	0.761	I(1)
Human Capital	1.838	-3.592	-2.931	-2.603	0.999	-1.775	-4.186	-3.518	-3.189	0.699	I(1)
Labour	-2.999	-3.592	-2.931	-2.603	0.042	-1.932	-4.186	-3.518	-3.189	0.620	I(1)
Consumer Goods Imports	-2.357	-3.592	-2.931	-2.603	0.159	-4.916	-4.186	-3.518	-3.189	0.001	I(1)
Capital Goods Imports	-1.709	-3.592	-2.931	-2.603	0.419	-2.475	-4.186	-3.518	-3.189	0.338	I(1)
Imports	-2.151	-3.592	-2.931	-2.603	0.226	-4.209	-4.186	-3.518	-3.189	0.009	I(1)
Primary Exports	-1.963	-3.592	-2.931	-2.603	0.301	-4.873	-4.186	-3.518	-3.189	0.001	I(1)
Semi Processed Exports	-1.635	-3.592	-2.931	-2.603	0.456	-3.124	-4.186	-3.518	-3.189	0.113	I(1)
Manufactured Exports	-4.535	-3.592	-2.931	-2.603	0.000	-2.890	-4.186	-3.518	-3.189	0.175	I(1)
Exports	-2.569	-3.592	-2.931	-2.603	0.107	-5.152	-4.186	-3.518	-3.189	0.000	I(1)

Pillips-Pirron (PP) Test for Unit Root

Variables:	with intercept	Critical values				With intercept & Trend	Critical values				I®
	1st	1%	5%	10%	Prob	1st	1%	5%	10%	Prob	
GDP	-5.653	-3.596	-2.933	-2.604	0.000	-5.719	-4.192	-3.520	-3.191	0.000	I(1)
Physical Capital	-4.203	-3.596	-2.933	-2.604	0.000	-4.849	-4.192	-3.520	-3.191	0.001	I(1)
Human Capital	-2.828	-3.596	-2.933	-2.604	0.060	-3.252	-4.192	-3.520	-3.191	0.088	I(1)
Labour	-5.929	-3.596	-2.933	-2.604	0.000	-6.493	-4.192	-3.520	-3.191	0.000	I(1)
Consumer Goods Imports	-4.509	-3.596	-2.933	-2.604	0.000	-4.860	-4.192	-3.520	-3.191	0.001	I(1)
Capital Goods Imports	-6.192	-3.596	-2.933	-2.604	0.000	-6.607	-4.192	-3.520	-3.191	0.000	I(1)
Imports	-5.486	-3.596	-2.933	-2.604	0.000	-5.882	-4.192	-3.520	-3.191	0.000	I(1)
Primary Exports	-7.272	-3.596	-2.933	-2.604	0.000	-6.836	-4.192	-3.520	-3.191	0.000	I(1)
Semi Processed Exports	-6.597	-3.596	-2.933	-2.604	0.000	-6.498	-4.192	-3.520	-3.191	0.000	I(1)
Manufactured Exports	-5.833	-3.596	-2.933	-2.604	0.000	-6.919	-4.192	-3.520	-3.191	0.000	I(1)
Exports	-5.529	-3.596	-2.933	-2.604	0.000	-5.677	-4,192	-3.520	3.191	0.000	I(1)