Agricultural Export and Economic growth: Evidence from Pakistan

By

Sajid Ali

MPhil Scholar

SCHOOL OF ECONOMICS,

QUAID-I-AZAM UNIVERSITY, ISLAMABAD

2021

Agricultural Export and Economic growth: Evidence from Pakistan

By

Sajid Ali

Supervisor

Dr. Javed Iqbal

Associate Professor

School of Economics

Quaid-i-Azam University, Islamabad

A dissertation submitted in partial satisfaction of the requirements for the Award of a Master of Philosophy Degree in Economics, School of Economics, Faculty of Social Sciences, Quaid-i-Azam University, Islamabad

2020

Dedication

I dedicate this research work to my parents and my family.

(Sajid Ali)

Certificate

This is certified that the dissertation titled **"Agricultural Export and Economic growth: Evidence from Pakistan"** by **Sajid Ali** S/O **Banat Khan** (Registration No. 02091813007) is accepted in its present form by the School of Economics, Quaid-i-Azam University, Islamabad as satisfying the dissertation requirements for the degree of Master of Philosophy in Economics.

Supervisor:

_____
Dr. Javed Iqbal
Associate Professor,
School of Economics,
Quaid-i-Azam University, Islamabad

Examiner:

_____
Dr. Muhammad Irfan
Associate Professor,
Economics Department,
COMSATS University, Islamabad

Director:

_____
Dr. Zahid Asghar
Professor,
School of Economics,
Quaid-i-Azam University, Islamabad

Declaration Form

I SAJID ALI, son of BANAT KHAN, bearing Registration No. 02091813007, candidate of M.Phil Economics at School of Economics, Quaid-i-Azam University, Islamabad do hereby declare that the thesis titled "*Agricultural Export and Economic growth: Evidence from Pakistan"* submitted for the partial fulfillment of Master of Philosophy (M.Phil) degree in Economics, is my own work. All the errors and omission are lonely goes to me and I also somberly pronounce that it will not be submitted for attaining any other degree in the future from any institution.

SAJID ALI

ACKNOWLEDGEMENTS

All praises and thanks to **ALLAH ALMIGHTY** The compassionate, The merciful, The only creator of the universe, and the source of all knowledge and wisdom Who blessed me with Good health, thoughts, talented teachers, co-operative friends and opportunity to make some contribution to the already existing ocean of knowledge. I offer my humblest thanks to the greatest social reformer, **The Holy Prophet Hazrat Muhammad (PBUH),** for His humanity.

I deem it my utmost pleasure in expressing my cadies gratitude with the profound
benedictions to **Dr. Javed Iqbal**, Associate Professor, School of Economics, Quaid-i-Azam University Islamabad, for providing me with strategic command at every step. I extend deep emotions of appreciation, gratitude and indebtedness for his valuable guidance.

I must acknowledge the support and prayers of my friends and other family members.

(Sajid Ali)

Table of Contents

Abstract

Among the main economic growth determinants, trade is the prominent factor which has been widely discussed in recent growth literature. The crux of the debate has been whether the countries that keep their economies open to foreign trade can grow faster. There is extensive literature available which is aimed to explore the association between international trade and growth by testing the hypotheses of either trade-led, import-led or export-led growth. However, empirical results regarding these hypotheses in the growth literature are mixed. The primary focus of the study is to analyze the hypothesis of export-led growth for Pakistan economy. Autoregressive Distributed Lag (ARDL) model approach is used in this study to explore the hypothesis using 48 years time series data from 1972-2019. Initially, data on exports at aggregate level was used and the results confirmed export-led growth hypothesis for Pakistan. The causality between GDP and aggregate exports was also conducted and the study found two-way causality between the two variables. Later on, exports were decomposed into agricultural goods and non-agricultural goods exports. The results revealed that export of agricultural commodities has positive impact (0.02) on output level albeit statistically insignificant. On the contrary, coefficient of exports of non-agricultural goods was positive (0.05) and highly significant. These results confirmed export-led growth hypothesis for non-agricultural goods. We also explore the causal relationship between agricultural exports and agricultural GDP. The study finds a uni-directional causal relationship between the two variables running from agricultural exports to agricultural GDP. The policy implication of the study is that in order to enhance the growth process of the country, Pakistan should divert its resources towards exports sector particularly more towards non-agricultural sector. Agricultural goods exports also have positive impact on GDP of Pakistan, however, there is dire need to export value added agricultural commodities rather than exporting goods in its raw forms. The study recommends that in order to boost agricultural GDP, exports from agricultural sector may be further enhanced. This study suggests further decomposition of agricultural and non-agricultural goods to analyze their role in agricultural GDP and total GDP growth respectively in future studies.

Chapter-1

INTRODUCTION

1.1 Background

Economists, since long time, are keen to know how the economic growth come about and what are the key factors that are responsible for huge variations in economic development across countries. The origin of realizing economic growth could be found back in 'classical economists' work where two distinct poles appeared; i) growth optimism led by Adam Smith and ii) growth pessimism piloted mainly by Malthus. According to Smith (1937), the process of growth, once started, "may be seen as self-generating" as opposed to the theme of "growth and decay" presented by the pole of growth pessimism. Smith (1937) highlighted key factors for economic growth including capital accumulation, division of labor and technological advancement. In his view, productivity of specialized workers in large-scale manufacturing could be much higher than the productivity of workers in a small-scale manufacturing. Similarly, through advance technology, fewer inputs could be used to attain the desired output level. The other pole explained the growth process by law of diminishing return where the growth process ultimately become stagnant.

Early economists, especially Smith (1937), emphasized the importance of land and labor for economic growth. As long as free land is available for population to work with, output of the country tends to grow till the land-labor ratio starts to decrease, i.e. marginal product of labor diminishes and so the real wages. Malthus (1798) argues that when real wages approach below the subsistence level, mortality rate will increase and population growth will decline to equilibrium level.

On the other hand, the new-classical economists, pioneered by Solow (1956), do not agree with Malthus (1798) argument. They argue that other factors, such as capital formation (i.e. labor have more capital to work with which leads to higher marginal product) and technology advancement (i.e. more output can be produced by having the same capital-labor ratio) shift aggregate

production function, thus overcome the declining incidence of output due to increasing population and scarce resources. One of the implications of neo-classical model is convergence i.e., countries with less initial capital will grow faster than countries having more initial capital. For example, Barro & Sala-i-Martin (1995) found conditional[1] convergence for 98 countries having data from 1960 to 1985.

In the economic growth literature, a large list of studies, both of empirical and theoretical nature, can be found that explore the factors responsible for economic growth. Generally, there are two broad categories of theoretical studies; i) studies following exogenous growth models and ii) studies following endogenous or new growth models while studies of empirical nature can be classified into cross-section growth studies and time series studies.

Recognizing the determinants of economic growth is of utmost importance for any country to achieve and maintain high economic growth. Various studies have been conducted in order to describe the path of long run growth as well as to explain divergence in growth across economies. The earliest and most important studies in the economic growth literature were conducted by Solow (1956) and Swan (1956) both of which were based on the neoclassical growth theory. The intriguing part of these studies was its simple assumptions and structure. "The key feature of Solow model is its assumption that capital accumulation follows diminishing return and hence it could not be the source of long run economic growth. The main determinant factor of long run output growth in Solow (1956) model is the rate of technological progress or Total Factor Productivity (TFP). Technical progress has been believed as exogenous in this model hence it is known as exogenous model of economic growth.

Mankiw *et al.*, (1992), an extension of Solow (1956) model, seek to reduce the level of 'Solow residual'. In this seminal paper, they argue that from a qualitative point of view, the Solow model predictions appear as true in empirical analysis. So, the long run growths across countries give the impression of being positively associated to investment ratio and negatively to population growth. Moreover, growth rates across countries show convergence. However, quantitatively, the Solow (1956) model does not deliver completely as convergence across countries did not take place. The reason behind this problem is that in the Neo-classical growth model the real driving force for

[1] Conditional in the sense, that some variables were kept constant in the process. These variables include primary & secondary enrolment, political stability, government consumption to GDP ratio, and market distortion.

growth differences across countries is capital accumulation. However, the return to capital in the national economy account for only one-third of the total output, the remaining two-third is the share of labor income (Mankiw et al., 1992).

The main inspiration behind the emergence of endogenous or 'new' growth model is to explore the factors that determine technical progress or, in other words, to reduce the size of Solow residual. Broadly speaking, there are four versions (based on determinants of technical progress) of endogenous growth theory; Romer (1986) argues that externalities cause technical progress, Lucas (1988) favors human capital as determinant of technical progress, Romer (1990) and Grossman and Helpman (1991) supports the R&D role for enhancement of TFP while Barro (1991) claims that public infrastructure investment can foster technical progress.

In endogenous growth theory, the growth rate of output depends on the stocks of human capital, knowledge capital, public infrastructure capital and their allied externalities. Therefore, in contrast to diminishing return to physical capital in exogenous model, the returns to capital in endogenous model either diminish less rapidly (e.g., returns to human capital) or do not diminish at all (e.g. returns of R&D investments). Economic growth literature emphasizes some other factors that also enhance the output growth including trade openness, institutional reforms, stable macroeconomic policies etc.

1.1.1 Trade and Growth

Among the main economic growth determinants, international trade and education (or human capital) are the two factors that have been widely discussed in recent growth literature. Effective trade policies of a country play a key role in its growth and prosperity. Proper trade policy management leads towards efficient resource allocation both at domestic level as well as at global level by eliminating inefficiencies. Majority of the developing economies followed the import substitution policies for faster economic growth during 1950s and 1960s. However, since mid-1970s, most of the developing economies have been shifting towards policies of promoting exports. The latter approach argues that exports growth brings about better allocation of resources, capital formation, scale economies and efficiency in production (through technological progress), and thereby economic growth. More trade liberalization enables the firms becoming more competitive as well as enables them to adopt more advanced technologies. Moreover, higher

exports ease the balance of payment constraint by providing more foreign exchange to finance imports of capital goods and other inputs. Since then, the export-growth argument remained at the center of economic growth debate. Nevertheless, empirical results in the growth literature are mixed.

On the empirical front, several empirical studies have documented a positive as well as significant link between export and economic growth (Michaely, 1977; Balassa, 1978, 1985; Chow, 1987; Tyler, 1981; Khan and Saqib, 1993; Singupta and Espana, 1994; Thornton, 1996; Panas and Vamvoukas, 2002; Awokuse, 2004; Siddiqui et al., 2008; Shahbaz et al., 2011; Fatemah, 2018). However, majority of the studies just focus on 'aggregate' real export in the export-led growth (ELG) hypothesis. Using aggregate real export in investigating export-growth nexus may mask important underlying differences among different export categories as stressed by Giles *et al*. (1993). Although, there are possibilities of export-growth nexus for certain groups of exports, this may not be revealed if export is used at aggregate level, hence spurious conclusion may be drawn. Giles *et al*. (1993) reject ELG hypothesis in terms of aggregate exports, however, they find support of ELG when they use certain export groups.

1.2 Research Focus

The primary focus of this study is to explore whether more trade (or export) can foster GDP growth of Pakistan. In order to validate this, the export-led growth hypothesis for Pakistan will be analyzed. To start with export-led growth hypothesis, the impact of aggregate exports on economic growth will be explored.

Exports are then decomposed into agricultural and non-agricultural goods to examine their respective role in Pakistan's economic growth. The main inspiration behind the analysis of exports by different categories is the argument of Giles *et al.* (1993) who argue that using aggregate real export in investigating export-growth nexus can mask important underlying differences among various export categories. Although, there are possibilities of export-growth nexus for certain groups of exports, this may not be revealed if export is used at aggregate level, hence spurious conclusion may be drawn.

With the above background, the specific objectives of this study are to;

1. *Explore export-led growth hypothesis for Pakistan by taking aggregate exports as a function of GDP*
2. *Estimate role of exports at disaggregate level on GDP by splitting exports into agricultural and non-agricultural goods exports*
3. *To investigate the causal relationship between agricultural exports and agricultural GDP for Pakistan*

1.3 Importance of the Study

1. The time period used here is 1972 to 2019; a substantially longer period than used by earlier studies (see, e.g Din et al, 2004; Shirazi & Munap, 2004; Quddus & Saeed, 2005; Siddiqui et al., 2008; Shahbaz et al., 2011; Fatemah, 2018)
2. This study also explores the effects of different export categories like exports of agricultural and non-agricultural; there are very few studies that attempted to examine role of agricultural exports on GDP for Pakistan.
3. Finally, this study aims to explore the causal relationship between agricultural exports and agricultural GDP; no study has attempted this area for Pakistan economy.

1.4 Organization of the Study

There are six chapters in the present study that starts with an introduction chapter. Chapter-2 presents an overview of Pakistan's economy focusing more on growth and trade sector. Different trade regimes and trade policies of the country are discussed in detail in this chapter. Chapter-3 is reserved for a review of literature including studies of theoretical and empirical nature regarding trade-growth nexus. The literature review is organized into three sections. Chapter-4 describes research methodology and data description. Chapter-5 presents estimation results of aggregate level export-led growth hypothesis for Pakistan followed by export-led growth at disaggregate level. Causality between agricultural exports and agricultural GDP is also explored in the chapter. Chapter-6 presents conclusion, policy implications and future areas of research.

Chapter-2

PAKISTAN ECONOMY: AN OVERVIEW

2.1 Introduction

Pakistan was among few developing economies that had been able to maintain its economic growth rate above 5 percent during four decades (1950's to 1980's). During that period the incidence of poverty reduced significantly from 40 percent to only 18 percent. The decade of 1990's was not a good one for Pakistan economy in terms of economic growth due to various factors including political instability and worsening law and order condition. Pakistan performed well in terms of economic growth during 2000's until 2006-07 when the economy grew at a considerable growth rate i.e. 7.2 percent a year. However, in the last few years Pakistan lost this growth momentum due to terrible insecurity as well as due to global economic crisis. The 2010's decade was a modest in terms of economic growth when the economy witnessed 4.3 percent average growth rate during the last nine financial years. This chapter presents an overview of Pakistan's economy mainly focusing on two sectors e.g. Growth and trade sector.

2.2 Growth Performance

The development process is characterized as one, which produces a fundamental change in structure of an economy. During structural changes, labor force is shifted from agriculture, a relatively low productivity area, to relatively higher productivity areas of manufacturing sector. In 1949-50, more than 50 percent share of total GDP attributed to agriculture sector followed by services sector (37.2%) and manufacturing sector with only 8.0 percent. Since then, the shares of different sectors in GDP composition of the economy have been changed. Now services sector is the largest sector by contributing 61.2 percent in the country's GDP followed by agriculture sector (18.5%) and manufacturing & mining sector with 15.7 percent share (Table 2.1).

Table 2.1 Composition of GDP by sector (Percent share)

	1969-70	*1979-80*	*1989-90*	*1999-00*	*2009-10*	*2018-19*
Agriculture	38.9	30.5	25.8	25.9	22.0	18.5
Manufacturing & Mining	16.5	17.6	17.6	17.0	16.8	15.7
Construction & electricity	4.2	5.1	7.4	6.4	4.2	4.5
Services	38.4	43.8	48.6	50.7	56.9	61.2

Source: Pakistan Economic Survey (Various issues)

Industrial sector performance was remarkable in the decade of 1960's when the manufacturing sector achieved an average growth of 9.9 percent. However, industrial concentration was a major problem in that decade as few families owned majority of the industries. To offset high industrial concentration, the then government started nationalization of industrial and financial sector in early 1970's. In 1970's, the growth rate of both GDP and manufacturing sector went down which could also be attributed to protectionist policy for domestic firms as well as ignoring proper monitoring of performances of these firms by the government.

The government changed its policy from import substitution strategy to outward oriented export promotion by liberalizing both its trade and financial markets during 1980's. As a result, the economy recovered considerably which resulted into high growth in GDP and manufacturing sector. The 1990's decade witnessed a low growth rate of GDP and industrial sector due to political instability together with worse law and order situation in the country. The average GDP growth rate fell from 6.1 percent in 1980's to 4.6 percent during 1990's. Pakistan performed well in terms of economic growth during the period of 2003-04 to 2006-07 with an average growth rate of 7.2 percent and double-digit growth rate in manufacturing sector."

In the last three financial years of 2000's, the country could not maintain that growth momentum due to terrible insecurity as well due to global economic crisis. The worst performing sector in that period was agriculture sector which grew with only 2.8 percent. In the first few years of 2010's, growth performance of the economy deteriorated even further due to many factors including energy crisis and overall security in the country. However, on average, the economy witnessed modest growth rate in all sectors except agriculture sector.

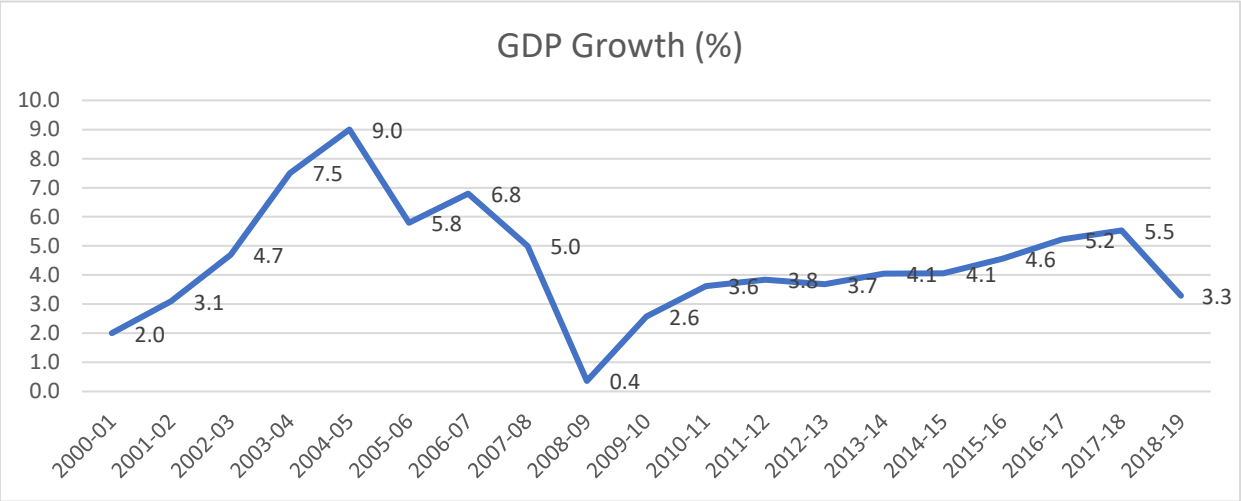
Table 2.2 Average Growth Performance of GDP and its Sectors *(Percent)*

	1970-79	*1980-89*	*1990-89*	*2000-09*	*2011-19*
GDP	4.8	6.1	4.6	4.8	4.3
Agriculture	2.4	5.4	4.4	2.8	2.3
Manufacturing	5.5	8.2	4.8	7.3	3.9
Services Sector	6.3	6.6	4.6	5.3	5.2

Source: Pakistan Economic Survey (Various issues)

There has been a consistent upward trend in GDP growth of the country during first half of the last decade. In 2004-05, the economy witnessed a significant growth (9.0 %) as against meager growth of 2.0 percent during 2000-01 (Figure 2.1). In the second half of the decade, the economy lost its growth momentum especially during 2007-10 period when the economy witnessed its average growth rate of only 2.7 percent as against a considerable growth rate of 5.3 percent during eight years of 2000s due to various reasons including financial crisis in global market, intensification of war on terror, adverse law and order situations, and monsoon rains and floods throughout the country (Pakistan, 2011). Since then, recovery has been witnessed in GDP growth rate touching 5.5 digit during 2017-18.

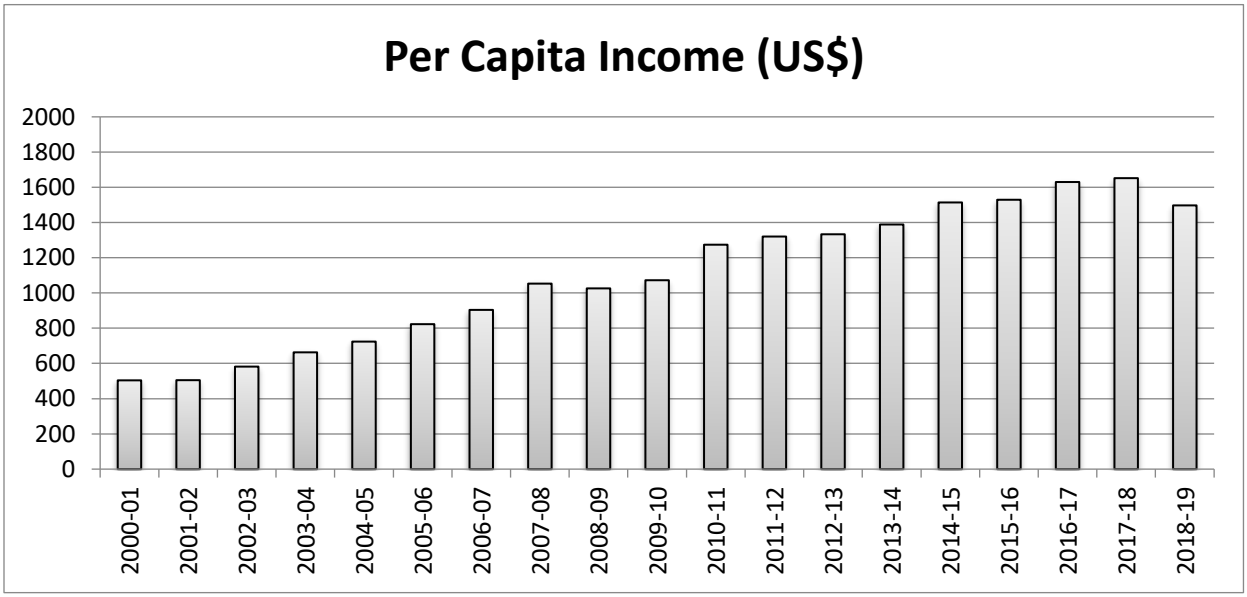
Figure 2.1 GDP Growth, 2000-01 to 2018-19 *(percent)*



Source: Pakistan Economic Survey

One of the key indicators of economic development of any economy is the level of per capita income. Per capital income grew by almost 7 percent during the period 2009-14 as against decline rate of 2.5 percent obviously due to worst economic growth of the decade during 2008-09. In dollar terms, per capita income grew from US $504 in 2000-01 to US$ 1,652 in 2017-18, thereby showing a substantial growth of 7.2 percent (Figure 2.2). In the last financial year, per capita income has declined significantly with more than 9 percent decline.

Figure 2.2 Per Capita Income, 2000-01 to 2018-19



Source: Pakistan Economic Survey

2.3 International Trade: Pakistan's experience

This section seeks to describe trade related policies followed by government of Pakistan from time to time. In 1947, when it came into being, Pakistan's industrial base was very narrow and limited to some cement factories, a small number of textile mills, and few sugar mills, having only 34 industrial units.[2] Being an agricultural base economy, Pakistan was exporting primary products for instance raw cotton, jute, wool and tea to other parts of the world. In the early stages of industrial development, nascent industries do not have the same economies of scale as their counterpart in the international market and thus lack the competitiveness. To protect their nascent industry, there

[2] This section is based on Khan (1998) and Zaidi (1999).

are numerous evidences where countries often adopted protective measures until they achieved competitiveness in the international market and hence Pakistan is no exception.

2.3.1 The Decade of 1950s

Pakistan followed import substitution strategy during 1950's to protect its nascent industry. Imports were restricted through instruments like overvalued exchange rate, quantitative restrictions on imports and other non-tariff barriers. The tax structure of the economy was developed in such a way that the revenue heavily depended on export taxes and import duties on manufactured goods. As main exports of Pakistan comprised of agricultural goods e.g. cotton and jute while its imports comprised of manufactured goods, the term of trade was in favor of industry as against the agricultural sector (because domestic producers of manufacture goods used to trade its products in domestic market at above international prices and used to buy raw inputs from agriculture sector at lower than the prevailed world prices.

2.3.2 The Decade of 1960s

Contrary to the 1950's policies of import restriction, the government of Pakistan pursued policies of export promotion in the decade of 1960. For example, the then government launched export bonus scheme. The scheme was aimed to favour manufactured sector exports. Secondly, special treatment was offered to industries having export potential in the form of preferential access to foreign exchange. Moreover, considerable measures were under taken for import liberalization in the country e.g. automatic renewal of import license for consumer goods and industrial raw materials.

The renewals of firms' import license were highly associated with their previous export performance. Firms with best performance in export received more liberal treatment in renewal of import licenses as compare to other firms that had to show proof of export orders before import licenses necessary for export production could be released. As a continuation of liberalization policy of 1960's, almost all the necessary raw materials for industries were placed on the free list of imported items.[3]

[3] As the name indicates, the free list items were not fully exempted from import duties.

In spite of all these measures, the degree of trade liberalization of 1960's was not so significant. The representation of export bonus scheme in the total imports was only about 5 percent for instance. Similarly, all the trade liberalization reforms were not implemented instantaneously but rather in parts. However, the export bonus scheme fostered the manufactured goods exports by 11.4 percent per annum. The total exports and primary goods exports grew only by 7.0 percent and 1.8 percent respectively during the same period. These policies resulted into a substantial increase in the share of exports of manufactured goods in total exports during 1960s and in subsequent decades.

2.3.3 The Decade of 1970s

The decade of 1970 witnessed some significant measures of trade liberalization in Pakistan towards reduction in anti-export bias. Three most significant measures were; (i) devaluation of Pakistani rupee, (ii) ending of restrictive licensing, and (iii) removal of export bonus schemes. The overvaluation of Pakistani rupee[4] in 1950's and 1960's encouraged import substitution in the country.

The government of Pakistan devalued its currency by 57 percent in May 1972 to encourage exports and consequently to correct the balance of payment situation in the country. The export bonus scheme was also eliminated to formulate more uniform effective exchange rates for exports. Furthermore, the restrictive licensing system cut down from six to only two import lists; i) free list of items, and ii) tied list of items.[5]

The above measures of trade liberalization resulted into a remarkable increase in manufactured goods export with a substantial growth rate of 26 percent per annum.[6] Despite all these measures, the overall trade and industrial policies remained biased against exports in 1970's [see Table 2.3]. The main reason for the presence of anti-export bias despite massive currency devaluation was export taxes.[7]

[4] Fixed exchange rate regime was in practice in that period.
[5] Items that could enter freely in the country were included in the free list while items that were restricted to enter the country were included in the tied list.
[6] In current rupee term.
[7] Khan (1998)

The beginning of 1970's was very critical in the political history of Pakistan when the country divided into two parts. This event had significant economic consequences for the country as larger portion of international trade was taking place between the two parts.[8] Another development that took place in 1970 was the oil shock which not only resulted into the world recession but also affected the balance of payment situation of the country.

Table 2.3 Effective ER for Exports and Imports (selected years)

Year	*Effective ER for Imports*	*Effective ER for Exports*	*EER Bias*	*Real Exchange Rate*
1970-71	6.60	4.91	1.34	4.61
1974-75	11.68	9.00	1.30	8.57
1981-82	16.06	13.17	1.22	12.45
1986-87	25.37	18.55	1.38	16.32
1990-91	32.52	25.50	1.27	22.66
1994-95	42.33	34.63	1.22	29.54
1996-97	49.61	41.25	1.20	35.80

Source: (Khan, 1998)

2.3.4 The Decade of 1980s

With the aim of reducing anti-export bias in the trade policy of the country, some more steps were taken to liberalize the trade in 1980's. Consequently, the import bans on industrial value added reduced from 41 percent in 1980 to 29 percent in 1986. Similarly the import restrictions in various forms were reduced from 22 percent in 1980 to only 3.7 percent in 1986. Tariff reforms of 1987 resulted into changes in the tariff structure. For instance, tariff was decreased from the level of 225 to only 125 %.

[8] Western Pakistan was exporting half of its exports to Eastern part while 18 percent of the latter's were going to the Western part (Zaidi, 1999)

On the exports side, some other measures were taken in 1980's. To boost the exports of the country, the most significant measure taken was that the Pakistani rupee was de-linked from dollar as well as the exchange rate system was converted from fixed to flexible exchange rate. Other measures included export rebates, concessionary credits and import facility for exporters.[9] Notwithstanding various measures taken towards trade liberalization in 1980's, the trade regime of the country remains discriminative against exports. Realizing the continuous anti-export bias regime, the government introduced Structural Adjustment Programs (SAP) in the late 1980's under the direction of International Monetary Fund (IMF). Since then successive governments have undertaken various steps towards liberalization of the trade regime.

2.3.5 The Decade of 1990s

The tariffication of non-tariff barriers and reduction in tariffs from 225 percent in 1986-87 to 45 percent in 1997-98 were the results of the trade and structural reforms in the country. These measures also permitted the imports of almost all items except some for which there were considerations on religious, health and security grounds. Moreover, the remaining non-tariff barriers were reduced and the number of products on the negative list reached to only 32 in 1999. The procedure for imports was simplified and licensing requirements were removed for goods outside the negative products list in the same decade.[10]

2.3.6 The Decade of 2000s

Pakistan started to liberalize its tariffs in early 1990's which was accelerated in 1997 in order to integrate its economy with other economies in global market. During 2001 and 2002, the dependence on subsidies for the promotion of exports was reduced, and except for the auto sector, all imports substitution programs were scrapped. There was a fear that liberalization would have negative impact on industrial growth as well as on revenue for the government. However, by comparing the growth of manufacturing and revenue which was less than 5% during the highly protective period of 90's with the growth of 12-14% per annum, this fear now seems to be baseless. In the same period exports grew by 28 per cent. This shows that tariff reforms along with taking other measures are helpful for exports growth.

[9] Zaidi (1999)
[10] (Din, Ghani, & Siddique, 2003)

The trade reforms undertaken by Pakistan in this decade were mainly under the directions of IMF. List of major reforms undertaken during the decade are given in Box 2.1.

These reforms brought about significant outcomes for trade openness[11] situation of the economy. Trade in terms of percentage to GDP increased from 25.7 percent during 2001-02 to 32.7 percent during 2005-06. The most conspicuous impact was on tariff structure (Table 2.4), for example average Most Favorite Nation (MFN) tariff rate declined from 45 percent in 1990s to only 14.5 percent in 2007-08 (Baig, 2009).

[11] Trade to GDP ratio.

"Box 2.1: Summary of Trade Reforms in 2000s

1. Export Related

- The entire export products freed from bans
- Exports subsidies as well as duties withdrawn
- The condition of registration for exporters relaxed
- Registration of pre-shipment confined only to urea and cotton

2. Import Related

- Nearly the entire Quantity Restrictions on imports removed.
- Registration requirement of importers with Export Promotion Bureau was removed
- The requisite LC margin withdrawn
- For more transparency and simplicity, the Import Policy along with procedures were rewritten
- Rules for Afghanistan Transit Trade liberalized
- Conditions of local content removed

3. Tariffs

- The highest tariff rate cut down to only 25 percent
- Nearly all tariff rates are based on ad valorem and bound with WTO
- Duty slabs limited to four only; regulatory duties also removed
- Concessionary SROs reduced in number
- Customs valuation were based on transaction value instead of Import Trade Price basis

4. State Trading

- Cotton and Rice Export Corporations closed
- The State level trading limited to special circumstances

5. Trade Facilitation and Custom Procedures

- Introduction of electronic clearance and documentation
- Single Administrative Document (SAD) introduced
- Clearing vessels procedure reduced to single step instead of 26; clearance time also reduced to eight hours

6. Others

- Harmonization of Standards with international prerequisites and compliance with commitments of WTO
- Reforming the mechanism of exchange rate
- Rates for export refinance made market compatible
- De regularization of Telecom sector
- Signing up Bilateral Investment Treaties with 48 countries.
- Large scale reforms in Financial Sector
- Establishing organizations like competition commission of Pakistan and Intellectual Property Rights

Source: Baig (2009)

2.4 Trade sector performance

Pakistan has been experiencing trade deficit since its inception except for 1950-51 where it had a trade surplus of US $ 53 million. The trade deficit started to grow faster after 2002-03 because of higher imports in the country until it crossed US$ 20 billion in 2007-08. More than 36 percent growth in trade deficit was witnessed during 2016-17 as compared to its previous financial year mainly due to substantial increase (18.4%) in country's imports together with slight decline in exports. In the last financial year, trade balance declined by 2.4 percent to its previous year figure. Considerable depreciation in exchange rate was one of the main reasons behind this improvement in trade deficit.

Table 2.4 Imports, Exports and Balance of Trade (selected years) *US $ Million*

Year	*Exports*	*Imports*	*Balance*
1970-71	420	758	-338
1980-81	2961	5410	-2449
1990-91	6129	7621	-1492
2000-01	9202	10729	-1527
2010-11	24810	40414	-15604
2015-16	20787	44685	-23898
2016-17	20422	52910	-32488
2017-18	23212	60795	-37583
2018-19	17071	40679	-23608

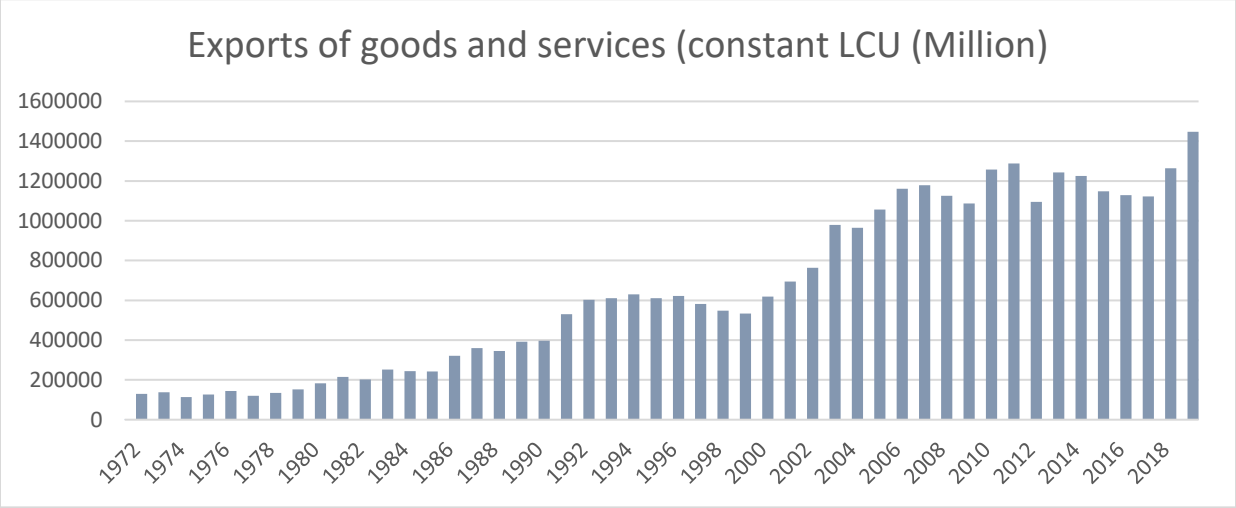
Source: Pakistan Economic Survey (Various issues)

2.4.1 Exports trend

Figure 4.1 shows exports trend of Pakistan from 1972 to 2019. Across decades, exports remain stagnant during 1970s. Exports start upward movement in the beginning of 1980s and reach the peak point during early 90's. One of the reasons of export boost was the liberalized trade policy that pursued by the government of Pakistan during 1980s. In 1980's banned and restricted imports were gradually liberalized besides removing the explicit import quotas on non-capital imports.

Consequently, the import restrictions in various forms were reduced from 22 percent in 1980 to only 3.7 percent in 1986. Similarly, the tariff rate was reduced to 125 percent from 225 percent. The 1990s decade was again a stagnant one in terms of export growth due to political instability in the country. Frequent changes in political power affected the investors' confidence badly. However, after the star of 2000s, country's exports started to rise and reached to another peak in 2007. From 2008 till 2017 exports remained almost stagnant mainly due to law-and-order situation emerged from war on terror. Due to non-conducive environment for investment, textile industry shifted to neighboring countries like Bangladesh. Consequently, Pakistan's exports were badly affected.

Figure 2.3 Trend of total exports from Pakistan 1972-2019



2.4.2 Concentration of Exports

Although the country's export has shown substantial increase yet it stayed concentrated in limited items like cotton products, rice, and leather products. The combine share of these items in Pakistan's total exports is more than two-third. Moreover, more than 75 percent of these three items exports belong to cotton manufacturers alone which make export concentration more intense. However, in the last few years the share of these three categories has declined from almost 73 percent during 2003-04 to less than 63 percent during 2011-12 while the share of other items has risen from 27 percent to more than 37 % in the same era. However, the contribution of these three items in total exports has increase to nearly 70 percent in the last financial year. This trend shows

that the country has the potential to diversify its export but the pace of diversification is still very slow.

Table 2.5 Major exports of Pakistan (Percent share)

Commodity	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	*2018-19*
Cotton Manufacturers	49.6	51.6	53.1	54.5	55	59.4	56.9	56.7
Leather	4.4	4.7	5.1	4.8	4.9	4.5	4.6	3.7
Rice	8.7	7.8	7.6	8.5	8.8	7.9	8.8	8.8
Sub-Total	**62.7**	**64.1**	**65.8**	**67.8**	**68.7**	**71.8**	**70.3**	**69.2**
Other Items	37.3	35.9	34.2	32.2	31.3	28.2	29.7	30.8

"Source: Pakistan Bureau of Statistics"

2.4.3 Exports' destinations

Like concentration in limited products, exports of the country were also concentrated in small number of countries of the world. Almost 50 percent of Pakistan's export goes to only eight major countries. Export's concentration kept on rising since 1970-71 till 2000-01. In the last decades, Pakistan has been able to slightly diversify its exports geographically. During 2001-02, more than 56 percent of the country's exports were destined to only eight countries (Japan, Hong Kong, UK, USA, Germany, KSA, China and Dubai) and the rest of the exports (43.3 percent) goes to remaining export markets.

However, the share of exports to the eight major markets declined to only 44 percent in the year 2010-11 (Table 2.6) while nearly 56 percent of the exports was shared by the rest all other markets. Share of these countries in exports has increased slightly again during 2018-19 due to significant increase of exports to China. Recently, Afghanistan has emerged as an important export market where more than 7 percent share of the exports goes. In the last decade, USA has been the largest export market of the country (i.e. almost quarter of total exports in 2000-01 and 17.0 percent in the fiscal year 2018-19). The share of exports in three major markets i.e. Japan, Hong Kong and China has reduced substantially over the years.

Table 2.6 Percentage share of Major countries in Pakistan's exports

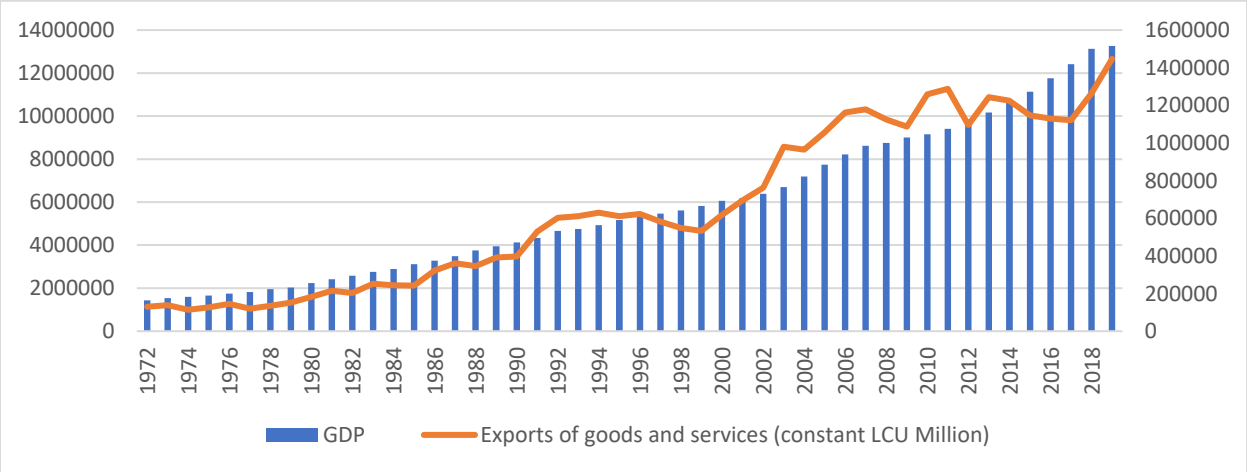
	1970-71	1980-81	1990-91	2000-01	2010-11	2018-19
Japan	9.8	6.4	8.3	2.1	0.7	0.8
Hong Kong	12.4	3.9	6.0	5.5	2.0	1.3
United Kingdom	9.4	4.0	7.3	6.3	4.9	7.0
United States	6.4	6.0	10.8	24.4	16.0	17.0
Germany	3.1	4.3	8.9	5.3	5.1	6.0
Saudi Arabia	1.5	6.0	3.6	3.0	1.7	2.1
China	1.1	12.2	1.0	3.3	6.6	8.0
UAE	-	5.0	3.1	6.8	7.3	3.0
Sub-Total	**43.7**	**47.8**	**49.0**	**56.7**	**44.2**	**45.2**
Others	56.3	52.2	51	43.3	55.8	54.8

Source: Pakistan Economic Survey

2.4.4GDP and Exports

Figure 2.4 shows trend of total GDP and exports of Pakistan for the last sixty years. We observe a common trend in GDP and exports of the country which confirms a strong link between the two variables of interest.

Figure 2.4 Trend of GDP and Total exports from 1972 to 2019



The overall average growth rate of GDP during 1972-2019 remained almost 5 percent. The most impressive periods in terms of GDP growth were 1980-84 and 1985-89 where the GDP grew at the rate of more than 6.0 percent while the mediocre period was 1995-99 in which GDP grew with only 2.7 percent. The main factors responsible for low GDP growth rate were the political instability and bad law & order situation in the country. Similarly, other factors include economic sanctions imposed on Pakistan after May 1998 and to some extent the 9-11 incidents.

Coming to country's aggregate exports trend, which grew by 5.5 percent during 1972-2019 period. Growth rate of exports was extraordinary during 2000-04 with average growth rate of 12.3 percent. We can find three periods i.e. 1970-74, 1995-99, and 2010-14 where exports growth remained in negative. Interestingly these were the periods when GDP growth was below 4 percent. This indicates a strong correlation between GDP and total exports of the country (Table 2.7).

Table 2.7 Five years average growth rates of GDP and Aggregate Exports (1972-2019)

Period	***GDP***	***Exports***
1970-74	3.1	-7.6
1975-79	5.2	2.9
1980-84	6.4	7.3
1985-89	6.1	10.3
1990-94	4.5	10.7
1995-99	2.7	-4.0
2000-04	4.2	12.3
2005-09	3.7	0.3
2010-14	3.8	-0.9
2014-19	4.6	5.8
1972-2019	4.9	5.5

"Source: Author's calculation based on FAO and WDI data"

2.4.5Composition of Imports

The import composition of Pakistan reveals that majority of the country's import comprises of raw materials for producing consumer goods as compared to the capital goods' raw material. A drastic change was observed in import composition during 1970's. Percent share of capital goods was 52 percent during 1970-71 which reduced to only 28 percent during 1980-81. Similarly, the share of raw material for consumer goods in total import soared from 26 percent in 1970-71 to 50 percent during 1980-81. However, after 1990-91 slight changes were observed in import composition of the country (Table 2.7).

Table 2.7 Imports of goods of Pakistan (Percent)

Period	*Capital Goods*	*Raw Material for*		*Consumer Goods*
		Capital Goods	Consumer Goods	
1972-73	29.8	9.9	30.8	29.6
1980-81	27.8	7.6	50.1	14.5
1990-91	32.9	6.8	44.6	15.7
2000-01	25.1	5.5	55.1	14.3
2005-06	36.9	7.3	45.0	10.9
2009-10	27.9	7.2	51.8	13.1
2015-16	31.8	9.0	40.5	18.7
2016-17	34.1	8.5	39.7	17.7
2017-18	31.1	9.9	43.0	16.0
2018-19	27.7	10.0	44.4	17.9

Source: Pakistan Bureau of Statistics

2.4.6Direction of Imports

Imports data suggest that Pakistan's imports are also concentrated in small number of markets and majority (nearly three-fifth) of the imports originate from USA, China, Japan, Saudi Arabia, UAE, Kuwait, Germany and Malaysia. Share of these few markets in total imports remained the same during 1990-91 to 2018-19 period. The only change that can be seen in the table is the drastic decline of imports from USA i.e. its share drops from almost 18 percent during 1990-91 to only

5.0 percent during 2018-19. Almost the opposite trend in imports from China was witnessed where its share jumped from only 5 to 24 percent in the last 3 decades. Among these countries, China is the leading import market with a share of 24 percent followed UAE (14 %), Saudi Arabia and USA (5.0 % each) and Japan (4.0%) (Table 2.8).

Table 2.8 Major Sources of imports (Percent share)

Country	*1990-91*	*1995-96*	*2000-01*	*2005-06*	*2009-10*	*2018-19*
USA	17.8	9.4	6.3	5.8	4.6	5.0
China	5.1	4.6	4.9	9.5	13.0	24.0
Germany	7.7	6.8	4.1	4.7	3.4	2.0
Japan	12.6	9.6	6.3	5.6	4.4	4.0
Malaysia	3.5	8.8	4.3	3.0	5.0	2.0
Kuwait	10.7	5.8	12.0	6.2	6.9	2.0
KSA	4.5	4.9	9.0	11.2	9.7	5.0
UAE	1.9	4.0	8.8	11.9	14.5	14.0
Sub-Total	**63.8**	**53.9**	**55.7**	**57.9**	**61.5**	**58.0**
Other Countries	36.2	46.1	44.3	42.1	38.5	42.0

Source: Pakistan Bureau of Statistics

2.5 Exports performance at disaggregated level

Export composition of the country has changed remarkably over the years. In the early years, when Pakistan came into being, share of agricultural goods exports was substantially higher than the non-agricultural commodities exports. However, after 1970, the share of agricultural commodities reduced to around 40 percent of the total exports while that of non-agricultural goods exports increased to nearly 60 percent (Table 2.9). Since then, the share of non-agricultural goods exports accelerated with great pace. Currently, share of agricultural goods exports shrink to one-fourth of the non-agricultural exports.

The share of agricultural commodities exports fell drastically during 1990's as compared to 1980's decade from 31.8 percent to only 14.5 percent during 1990's. This share further declines to 11.6 percent during 2000's. However, agricultural sector exports share improves during the last decades with an average 18.9 percent in total exports of the country.

Table 2.9: Average Percentage composition of Agricultural and Non-agricultural exports across decades

Year	*Agricultural exports*	*Non-agricultural exports*
1970's	40.2	59.8
1980's	31.8	68.2
1990's	14.5	85.5
2000's	11.6	88.4
2010's	18.9	81.1

"Source: Author's calculation using FAO and WDI data"

Table 2.10: Five years average growth rates of GDP, agricultural and non-agricultural goods exports *(percent)*

Period	*GDP*	*Exports by economic Classification*		
		Total exports	Agricultural	Non-agricultural
1970-74	3.1	-7.6	-21.1	3.2
1975-79	5.2	2.9	-4.1	7.2
1980-84	6.4	7.3	-3.2	12.9
1985-89	6.1	10.3	10.9	10.1
1990-94	4.5	10.7	-5.6	13.4
1995-99	2.7	-4.0	-2.9	-4.1
2000-04	4.2	12.3	7.0	13.0
2005-09	3.7	0.3	10.3	-1.3
2010-14	3.8	-0.9	2.9	-1.7
2014-19	4.6	5.8	6.4	5.6
1972-2019	4.9	5.5	2.1	8.4

"Source: Author's calculation using FAO and WDI data"

The overall average growth rate of GDP during 1972-2019 remained above nearly 5 percent. The period of 1980-84 was the most striking period for GDP growth of the economy i.e. the economy grew at the rate of 6.4 percent while 1995-99 was the ordinary period for GDP growth when average growth rate remained below 3 percent (Table 2.10). The main factors responsible for low GDP growth rate during late 1990s were the political instability and bad law & order situation in

the country. Similarly, other factors include economic sanctions imposed on Pakistan after May 1998 and to some extent the 9-11 incidents.

While the average growth rate of 'aggregate' exports remained 5.5 percent, there was a big gap between the average growth rates of agricultural and non-agricultural goods export during 1972-2019 period (i.e., growth rate of agricultural goods export was 2.1 percent as against 8.4 percent growth for non-agricultural goods export). Average growth rate of agricultural commodities had decreasing trend since 1970 and remained in negative during the next three decades (i.e. 1970 to 2000) except 1985-89 period where it grew by more than 10 percent a year. In the last two decades, agricultural commodities exports got some momentum while non-agricultural goods export failed to maintain its pace of growth. As mentioned earlier that the reason of low growth of non-agricultural goods export had been the energy crisis in the country as well as law and order situation created by war on terror after 9-11 incidence.

Figure 2.5: Trend in GDP, exports of Agricultural and Non-agricultural commodities

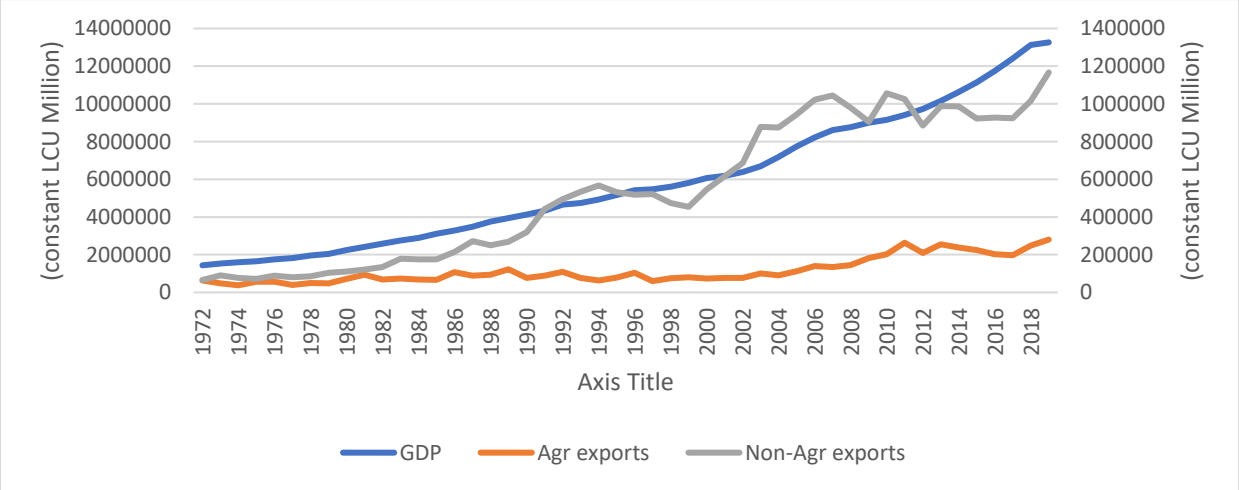


Figure 2.5 shows the trend of GDP, exports of agricultural commodities and non-agricultural commodities for the last 49 years. GDP in constant LCU terms grow consistently throughout the sample period. However, fluctuations in exports of both the commodities are more visible during period under study. Agricultural commodities export shows no prominent growth in value term till early 2000's. However, slight growth is observed after 2003 till 2011. On the other hand, non-agricultural goods exports show significant growth albeit some fluctuations during the sample period.

Chapter-3

A Review of Literature

3.1 Introduction

According to the argument of the endogenous growth theory, the primary source of economic growth is either trade or human capital (e.g. Romer, 1989; Lucas, 1988; Grossman and Helpman, 1991; Young, 1991; Stokey, 1991). On empirical front, Dollar (1992) and Harrison (1996) show favorable role of trade in economic prosperity. Similarly, in human capital led growth context, Barro (1991), Barro and Lee (1993) find evidence that human capital contributes positively in the long-run growth process. However, controversies exist among researchers regarding the favorable (or otherwise) contribution of exports in the growth process.

This chapter reviews both the theoretical and empirical underpinnings pertaining to the role of exports in the growth process. The next section is reserved for theoretical background of the study which is followed by the review of empirical literature regarding trade-growth nexus or export-growth nexus. Each section of the empirical review has been further divided into three parts; i) studies conducted across countries (i.e., cross-country studies), ii) country-specific studies, and iii) studies related to Pakistan. Review of literature on the role of disaggregated exports on GDP related to Pakistan economy is also part of this chapter.

3.2 Theoretical Background

Early economists, particularly Adam Smith, emphasize the importance of 'natural resources' (e.g., land) and 'human resources' (labor) for economic progress of a country. According to Smith, as long as the population of the country keeps occupying the available free land, its output likely to grow. When the free land ceases to exist, the additional labor to fixed land will reduce the land-labor ratio. Consequently, each labor has less land to work with which leads to slower output growth vis-à-vis population growth. Low land-labor ratio brings about reduction in marginal product of labor and hence real wages. On the other hand, Malthus (1798) argues that when real

wages reach below the subsistence level, mortality rate will increase which will bring the population level back to equilibrium point.

In early 1950's, some economists start to believe that the path of long run growth is only achievable through more investment and thereby through more capital accumulation. Nevertheless, some other economists argue that greater capital accumulation will result into slower growth rate due to diminishing return. They argue that economies can exhibit rapid growth with high saving rates but it will be a short-run experience. The long-run determinant of economic growth will be higher labor productivity and thus countries having small stock of capital will exhibit faster growth as compared to countries having large stock of capital. These circumstances will end up with equalized growth rate attributable to convergence phenomenon. Low

Most of the economists consider the Solow-Swan (1956) model of growth as the starting point for understanding economic growth. The basic fact behind 'Malthus pessimism' was that he did not realize the role of capital formation and technological progress in the growth process. Solow (1956) neo-classical model gives us some insight into how these two factors enhance the economic progress of any economy. Neo-classical economists use capital-labor ratio to understand the growth process as compare to land-labor ratio of classical economists.

The simple two factors Neo-classical growth model assumes constant return in two factors, capital and labor, but diminishing return for each factor. Furthermore, the perfectly competitive economy is driven by an exogenous saving rate and population growth. The beauty of this model is its parsimonious nature. This model has been followed by the economists for decades due to its simple structure and assumptions.

In the Solow-Swan model, per capita economic growth takes place through increase in the capital stock per worker. Higher investment rate relative to population growth rate results in to more capital deepening and ultimately into higher per capita economic growth. The assumption of diminishing return to factor input implies that, other things equal, the initial stock of capital per worker should be negatively associated with the economic growth rate. Ultimately, the economic growth rate of poor countries will converge on the growth rate of rich economies.

Recent growth theorists, however, discard the neoclassical growth theory in favor of endogenous growth theory. Endogenous growth theory assumes constant and increasing return to capital as opposed to neoclassical growth theory assumption of diminishing return. The critics of the neoclassical growth theory claim that this theory fails to explain the growth differences across countries. The endogenous growth theory is different from neoclassical growth theory in the sense that the former introduces human capital (Lucas, 1988), externalities (Romer, 1986), investment in R&D (Grossman and helpman, 1991) and public infrastructure (Barro, 1991) in the model to capture their role in growth. The endogenous growth theorists argue that these factors are subject to increasing return or at least negating diminishing returns in production in these models.

3.3 Export-led Growth

The conventional trade models emphasize trade to be more open as in this way the value of the economy's production increases. These models show only the static gain from trade in the sense that openness to trade improves allocative efficiency. In the Ricardian model of international trade when trade openness increases, the economies tend to specialize in those products where they have comparative advantage against other economies and thus starts its exports to other countries. According to Heckscher-Ohlin model, a country tends to export those goods where the country's abundant factor is intensively used in the goods production. In this way, the country's resources shift towards the sectors where the abundant factor of the country is mostly used. Similarly, in some models of economies of scale with monopolistic competition, the increase in total output can also be found (Krugman, 1979). However, there are models of international trade where total output of each good does not change when an economy gets more open (Krugman, 1980).

In the economic growth models, nexus of trade and growth is not very clear. The early growth models, Harrod-Domar model, for example, show positive growth effects of trade on economy (Harrod, 1939; Domar, 1946). However, in the neoclassical growth models (e.g., Solow, 1956) and Optimal-saving model (Cass, 1965), the output growth is considered as entirely exogenous. These models suggest that the steady-state rate of growth depends upon the growth rate of inputs (typically labor) and equally on the rate of technological progress both of which are exogenous. The extensions of these models for example, Baldwin (1989) and Srinivasan and Bhagwati (1980) argue that there is only temporary effect of trade on output growth.

The neo-classical growth models assume that when the ratio of capital-labor increases considerably, the marginal product of capital approaches to zero. One of the implications of such assumption is that the policy changes have no or little effect on steady-state growth rate. However, Srinivasan (2001) argues that policy changes (e.g., trade liberalization) can have both the level and growth effects on output in the long run provided the marginal product of capital is confined to some positive number. In this case the neo-classical model is just like Harrod-Domar model which implies that trade openness brings about positive growth effects.

Although most of the empirical studies have supported positive relation between trade and growth, however, some other studies are skeptical on this association. The proponents of the positive link between trade and growth include among others, Dollar (1992), Harrison (1996), Edwards (1998), and Greenaway et al. (2002). They argue that economies that are more open are more capable to absorb and utilize advanced technologies from advanced countries and thus can achieve higher growth rates. Grossman and Helpman (1991), on the other hand, argue that protectionist policies of a country can enhance long-run growth provided these interventions encourage investments in those goods where the country hold international advantage. Rodriguez and Rodrik (2000) also show doubts on the positive effect of trade openness on output growth.

The empirical studies on export-growth nexus may be divided into 3 major groups. Initially, large number of studies use correlation coefficient technique using cross-country data to support ELG hypothesis. It was followed by studies using regression analysis by least square methods. More recent empirical studies follow time series econometric techniques to investigate association between exports and growth (Giles and Williams, 2000 Part 1). In the following sub-sections a review of export-led growth is presented.

3.3.1 Cross-Country Studies

Quite large number of cross-country studies employs simple ordinary least squares (OLS) technique or rank correlation coefficients to investigate association between exports and GDP. Various definitions for economic growth and exports variables are used; number of sample countries range from few to more than hundred. The export led growth is supported when we find positive correlation between the two variables (Giles and Williams, 2000 part 1). Feder (1983) uses export to GDP ratio to explore its effect in economic growth for a sample of less developed

countries. The study shows that marginal factor productivity for export-sector has been greater than the non-export sector. He therefore concludes that growth could be enhanced by reallocation of resources export sector which is more efficient than the non-export sector.

Kavoussi (1984) investigates the nexus of exports and growth for low- and middle-income countries. This study reveals positive impact of exports on economic growth through a channel of enhancing TFP. Dollar (1992) explores the role of trade liberalization in economic progress across developing countries. By constructing the outward orientation index as a proxy for trade liberalization, the study shows strong correlation of per capita GDP to outward orientation index.

Tyler (1981) shows that exports along with capital formation are significant determinants of inter-country differences in GDP growth rates using a sample of 55 developing countries. He also uses growth rate of manufactured goods export as a substitute of growth rate of total exports and finds similar results to those obtained using the growth rate of total exports.

Miller and Upadhyay (2000) investigate impacts of trade openness on TFP using panel data set for 83 countries using data from 1960 to 1989. According to this study, the trade openness is one of the potential determinants of TFP growth of the sample countries. The study also finds significant impact of trade orientation on economic performance of these countries.

Sub-Saharan African (SSA) Countries are far behind in economic development context than other parts of the world. To examine the causes of slow performance of SSA countries, Njikam et al (2006) examines the factors behind differences in total factor productivity across twenty seven SSA countries. The study reveals that Physical capital accumulation is important for TFP growth for these countries. Secondly, Openness to trade enhances TFP in SSA countries provided that issues like poor transport and communication infrastructure, education of the labor force and bad governance are addressed."

The problem of endogeneity in growth regression is very common which leads to wrong interpretation of the results. As a result of endogeneity, the effect of one variable may be overemphasized, which is the case when trade openness is regressed on GDP growth. A study by Frankel *et al.* (1996) explores the role of openness in economic growth for East Asian economies after coping with the endogeneity problem of trade through instrumental variable in the form of proximity to trading partner. After dealing with endogeneity problem, the results show that

openness has more powerful effect on economic growth than in standard OLS estimates. In short, they conclude that simultaneity is not a serious problem in evaluating the effect of openness on growth.

Yanikkaya (2003) uses different measures of trade openness to examine its effect in the growth process. The study divides openness measure into two groups i.e., i) trade volume and ii) trade restrictions. A sample of 100 developed and developing countries is used in the study and the main findings suggest that countries with higher trade volume (or trade share) can grow faster than other countries. Moreover, contrary to the conventional view, trade restrictions have significant role in economic growth of the sample countries.

A study by Makki and Somwaru (2004) investigate trade-led growth and FDI-led growth hypothesis across 66 developing countries. Both of the hypotheses are supported by the study. The interaction term of trade and FDI also suggest strong positive role for economic growth. Mamoon and Murshed (2005) investigate the importance of trade liberalization for economic growth performance. Their first finding is that openness to trade, by removing trade restrictions and trade barriers, is good for economic performance. Furthermore, they conclude that human capital stock can lead to improved institutions as well as better utilization of trade policies.

Akinlo (2006) investigates the effect of export to GDP ratio on TFP growth using a panel of 34 SSA countries. The study finds positive role of exports on economic growth of these sample countries. Söderbom and Teal (2003) examine the impact of foreign trade on economic performance for a panel sample of 93 countries. Using Penn World Table (PWT) data for export plus import ratio to GDP as a proxy for openness, the study shows a significant effect of openness on productivity growth.

Sometimes an explanatory variable fails to explain its effect when regressed individually but shows significant impact when interacted with another variable. Isaksson (2002) applies this exercise to examine the trade-growth nexus for 73 developing and developed countries for the period of 1960-94. Findings of the study show that human capital has positive and significant impact on economic growth while that of total trade has insignificant effect. However, an interaction term of human capital and trade confirms a significant impact on growth. Similarly, interaction of human capital with import and export highlights positive outcome for economic growth, however, interaction of

human capital with import has larger effect on growth as compare to the interaction of human capital with export. This result further suggests that an economy can benefit from technology transfer only if it has sufficient amount of human capital to absorb technology.

Contrary to the general approach that trade and human capital affect output growth directly, Christopoulos (2007) suggests that these two could affect output growth indirectly through their impact on country's efficiency performance. This study investigates the impact of trade and human capital on efficiency performance across 83 countries. The study concludes that trade significantly improves country's efficiency performance.

A number of forms of international integration have been used in the literature to investigate its function in nations' economic growth. Of these four forms of international integration i.e. trade flows, inward foreign direct investment, membership in trade blocs and preferential agreements have been used by Haveman et al. (2001) in a study to assess its role in economic growth. The lesson of the study is that international integration leads to faster growth, particularly, increase in inward FDI, higher trade share in GDP, having a membership of a trade bloc and an increase in exports to relatively rich countries do play role in economic growth.

However, some studies argue that trade-led growth hypothesis does not remain true for all countries (for example, Kormendi and Meguire, 1985; De Gregorio, 1992; Amirkhalkhali and Dar, 1995; Burney, 1996; Rodriguez & Rodrik, 2000). The three obvious reasons for these contrary results include different time periods, country sample and variable definitions (Giles and Williams, 2000). Gonçlaves and Richtering (1987), for example, conclude positive association between the two variables when total GDP is used for growth but find no correlation when non-export GDP is used. Amirkhalkhali and Dar (1995) conclude that groupings of countries matter for ELG. Burney (1996) shows that ELG changes by changing time periods.

Subasat (2002) investigates to verify the 'export-led growth' hypothesis for large group of countries. Using Export Promotion Policy Index (EPPI) as an indicator of trade orientation instead of simple trade intensity, this paper does not provide any evidence in the favor of the hypothesis. The analyses show a weak positive correlation between EPPI and economic development for Middle-income countries, while no correlation between export promotion and economic development for both low-income and high-income countries.

Similarly, Rodriguez & Rodrik (2000) study regarding trade policy and economic growth strongly opposes the negative relationship between trade barriers and economic growth. This study analyses four influential papers in the field of trade policy and economic growth i.e. Dollar (1992), Sachs and Warner (1995), Ben-David (1993), and Edwards (1998). This study argues that the strong result between trade and growth in the literature arises either from misspecification or using measures of openness that are proxies for other policy or institutional variables i.e. the coefficients of different measures of openness are sensitive to other control variables of policy and institutional quality. The end result of the paper is that the negative relationship between trade barriers and growth is doubtful.

3.3.2 Country-Specific Studies

High levels of export and huge Foreign Direct Investment (FDI) have been considered to play their role in GDP growth. Now the question arises about their relative importance in the growth process. Tanna and Topaiboul (2005) investigate the causal relationships among human capital, FDI, export and economic growth and to check the export-led hypothesis for the Thailand economy. Through bi-variate and multivariate causality tests, the study finds support for the export-led growth hypothesis, but relatively weak support for FDI-led growth. However, the interaction term of human capital and FDI has positive role in the Thailand economy which suggests that a nation should have a minimum threshold level of education to take advantage of foreign technology.

Modern econometrics techniques, for example, Co-integration are being widely used in empirical analysis to examine the long-run relationship among economic variables. Dawson (2006) investigates the relationship among exports, imports and economic growth for Bangladesh using Johansen co-integration technique. The results show long run relationship between the two variables. Moreover, the impulse response dynamics show that a shock in the country exports bring about substantial change in GDP while there was no evidence for the other way around.

Chou and Wong (2001) investigate the main factors of Hong Kong economic growth. Instead of estimating the residual in the production function, this paper incorporates factors of growth directly into the growth equation and finds that import volume, FDI, and domestic production have significant impact on economic growth of Hong Kong. Moreover, TFP has significant contribution

in Hong Kong's economic growth but if there are no trade effects, the average annual contribution of TFP to growth falls by a percentage point.

Chuang (2000) examines the causal association of total exports and GDP growth for the Taiwanese economy. Johansen co-integration technique was used to confirm the long-run association among the variables. Also, Granger causality was used to establish causal relationship. The study confirmed the existence of long-run relationship among the variables including exports. Secondly, a bidirectional causality was found between GDP and exports. A study of Veganzones and Winograd (1997) estimate production function for Argentina using long term series instead of cross section analysis. The study finds an unstable effect of trade openness on economic growth for Argentina for a long time series data.

Lee (2005) analyzes major factors in Korean economic development. The estimation results suggest that Korean economic growth is achieved by technological development, human capital accumulation as well as accumulation of physical capital. Moreover, it has been concluded that the international trade expansion variable plays a strong and positive role for economic growth in Korea.

Some studies show importance of both exports and imports for economic growth. For example, Awokuse (2007) investigates the role of international trade for economic growth. Johansen co-integration, and Granger causality techniques are used to explore the causality and long run association among exports, imports and growth for three selected European Countries. Using quarterly data, this paper shows that exports cause economic growth in Czech Republic. Similarly, for Bulgaria both export-led growth and growth-led export hypothesis are confirmed while for Poland, the results only support import-led growth hypothesis. Overall, the paper concludes that imports are equally important for growth and not just exports.

Keong, Yusop, and Liew (2003) conduct a study to verify the ELG hypothesis for the Malaysian economy having data from 1959 to 2000. Utilizing the Johansen cointegarion test for long-run relationship and error-correction modeling for short-run causality relationship, they conclude that a stable long run relationship exists among economic growth, exports, and other controlled variables. Besides, they find that the ELG hypothesis is valid for the Malaysian economy in both the long and short run.

However, there are studies that find no evidence of ELG hypothesis. For example, Guadalupe et al. (2007) conduct a study to investigate the role of a country's external sector on its economy performance i.e. to empirically test the ELG phenomenon for the Cuban economy. The study employs error correction and augmented Vector Auto Regressive (VAR) modeling techniques and concludes a weak as well as insignificant link between exports and economic growth. Furthermore, the results suggest that imports are more important than expansion of exports for the Cuban economy to grow faster.

Agrawal (2015) explored export-led growth hypothesis for Indian economy. The data used was from 1960 to 2012. The analysis was done for two period; pre-liberalization (1960-1991) and post-liberalization (1991-2012). The study found one sided causality that runs form GDP to exports for the pre-liberalization period and bi-directional causality between exports and GDP for the post-liberalization period.

Tahir et al. (2015) explore the ELG phenomenon for Sri Lankan economy using cointegration and Granger causality methods. The findings of the study show no long-run link between exports and GDP of Sri Lanka. The causality test shows no causal relationship between the two variables in either way. Thus, the ELG phenomenon is rejected for Sri Lanka.

3.3.3 Pakistan relevant literature

There are quite a few studies investigating the ELG hypothesis for the Pakistan economy. Most of the studies exploring the exports-growth nexus confirm the ELG hypothesis for Pakistan. For example, a study by Quddus and Saeed (2005) investigate causal relationship for export, GDP and investment for the period of 1970-71 to 2003-04. The study confirms that exports cause GDP growth and hence suggests export promotion strategies for the growth of Pakistan economy.

Dodaro (1993) examines association of exports and growth as well as causality between the two variables using time series data of various countries at individual level. The study concludes a weak support for causality from export to GDP for majority of sample countries including Pakistan.

To investigate Granger causality among variables, it is very common in the empirical research that only two variables are used. However, it has been identified that omitting some variables in the

VAR estimation process, there are possibilities of committing Type I and Type II errors[12]. In other words, if some significant variables are omitted in the estimation process, one can erroneously reject the true causality and can establish causality among the variables although it is not there.

Incorporating imports as an additional variable to investigate the export-led growth theory for the Pakistan economy in the multivariate Granger causality procedure, a study by Shirazi & Manap (2004) finds a long-run relationship among the variables of interest including exports, GDP, and imports having data for 1960 to 2003. This study finds that causality runs from exports to GDP growth and not conversely.

According to some famous studies e.g., Grossman & Helpman (1991), Edwards (1992), Romer (1994), Barro and Salai Martin (1995) the technological change, which resulted into productivity gains and economic growth, can highly be affected by trade openness of a country. An important study by Din et al. (2003) carried out on Pakistan economy explores the link between trade openness and GDP growth of Pakistan. In this study, Din et al. (2003) take exports plus imports as a proxy for openness to trade. The Granger causality technique has been used in the error correction framework to find relationship between the two variables both in the short-run and long-run. While the short run causality in either direction is not detected, the study shows a strong support for causality running in both directions in the long run, i.e. GDP Granger causes openness and openness Granger causes GDP growth.

A stud by Anwar and Sampath (2000) investigate the ELG hypothesis using time series data for 97 countries including Pakistan. The study finds one way causality that runs from exports to GDP in case of Pakistan. Kemal et al (2002) find strong evidence of causality running from exports to GDP in the long run for Pakistan, However, no such causation was found between the two variables in either direction in the short-run. Oskooee and Alse (1993) show strong support for a two way causality between GDP growth and exports in eight out of nine developing countries including Pakistan.

Hameed et al. (2012) investigated causal link between exports and GDP growth for Pakistan economy. The study found unidirectional granger causality between the two variables running from GDP growth to total exports in Pakistan. Similarly, Hussain (2014) analyzed GDP and

[12] Riezman et al (1996)

exports nexus for Pakistan. The study found no long-run relationship between the two variables using Johansen cointegration approach. However, through Granger causality approach the study found one-way causality that run from GDP to exports.

Fatemah and Qayyum (2018) explored relationship between GDP growth and exports using Pakistan's economy data from 1971-2016. Through Johansen cointegration approach, the study found significant connection between the two variables both in the short-run as well as in the long-run.

Shah et al. (2020) analyzed growth and exports nexus for Pakistan. By using data from 1976-2015 and employing Johansen cointegration technique, the study found long run association among the variables of interest. The findings of the study reveal a one-way causality in the direction of exports to GDP and not the other way around.

3.3.4 Export composition and Growth

Agriculture sector contributes significantly in economic growth of developing economies as evident from the higher share of agriculture sector in total GDP. As mentioned by Johnston and Mellor (1961) that enhancing agriculture sector exports likely increase incomes and foreign exchange earnings. Dawson (2005) investigates the impact of export sector on GDP growth by dividing total exports into agricultural and non-agricultural exports of 62 less developed economies for the year 1974-1995. Using fixed effect and random effect panel model, the study finds positive and significant coefficients for both the agricultural and non-agriculture variable.

Sanjuan-Lopez and Dawson (2010) examine the role of agricultural exports in GDP growth for 42 developing economies. The results of the study reveal the existence of long-run relationship between exports from agriculture sector and economic growth of developing countries. Granger causality was found running from aggregate exports to economic growth thereby suggesting export-led growth hypothesis. However, at disaggregate level, elasticity of agriculture export to economic growth was less than the elasticity of non-agriculture export. The study also found that non-agriculture export was more important for economic growth of relatively higher income economies among the sample of 42 developing countries.

Faridi (2012) examined impact of agricultural exports on GDP growth of Pakistan economy. Data used for the period of 1972-2008 and by applying Johansen cointegration technique, the study found negative impact of agricultural export on economic growth of the country. Moreover, bidirectional causality was found between the two variables.

Edeme et al. (2016) explore the role of agriculture sector exports on GDP growth of 15 African economies. The study uses panel data for these economies for the period starting from 1980 to 2013. The results of the study reveal that agricultural exports have positive impact on economic growth of the sample countries when data of the whole region is used. Moreover, at country level data, the impact of agricultural exports on economic growth was mixed.

Bakari and Mabrouki (2017) analyze agricultural sector exports and economic growth nexus in seven South Eastern Europe countries. Using annual data from 2006-2016 and applying correlation analysis and panel estimation technique, the study finds positive and strong effect on economic growth of the sample countries. Shafiullah et al. (2016) explore the export-led growth hypothesis for Australia as well as by different regions. Exports are disaggregated into different sectors including manufacturing, mining and fuels, agriculture, and others. They find that exports of mining and fuels sector contributes significantly into economic growth of Australia at national level as well as its three regions namely Queensland, New South Wales, and Western Australia in the long run. In the short-run, the ELG hypothesis is confirmed for smaller region including Tasmania, Northern territory and South Australia.

Mahmood and Munir (2017) investigated relationship between GDP growth and agriculture sector exports using data from 1970-2014 for Pakistan economy. The methods employed in this study were Johansen Cointegration and Granger causality approach. The results showed positive but insignificant impact of agriculture sector export on economic growth of the country. Ahmad and Ahmad (2018) explore export and growth nexus by bifurcating exports into agricultural and non-agricultural exports. Using data for time span 1972-2014 and Johansen cointegration technique, the study finds positive and significant impact of both agriculture and non-agriculture exports on economic growth of Pakistan. Further, elasticity of agricultural exports to economic growth was more than the elasticity of non-agricultural exports to economic growth.

CHAPTER-4

DATA AND RESEARCH METHODOLOGY

4.1 INTRODUCTION

As per the argument of the neoclassical economists, countries that were able to enhance exports were also able to get higher growth rate. This argument was highly based on the remarkable growth experience of the newly industrialized economies[13]. However, using a number of statistical techniques, there are conflicting results. To explore the ELG hypothesis, three different methodologies have been identified. The first one use correlation coefficients technique for cross-country analysis; the second category follow regression application (generally least square techniques), while the third category apply different time series techniques.

Majority of the early cross-section studies investigate ELG hypothesis by either rank correlation coefficients or by simple OLS regression between exports and GDP. These studies conclude in support of ELG hypothesis when they find positive and statistically significant correlations among the variables. As exports are also part of GDP, some studies use GDP net of export to avoid spurious correlation between them. Furthermore, as only exports and GDP were used in the early studies, some authors suggest that this correlation may be reflective of underlying associations through other economic variables. Therefore, the subsequent cross-section studies make use of aggregate production function including exports as explanatory variables along with basic determinants of production function. In these models the positive and significant coefficient of exports thus validates ELG hypothesis.

The cross-section models assume that the regression parameters are constant across countries and do not allow for differences among countries in terms of their institutional, political and financial

[13] Hong Kong, Korea, Singapore and Korea

structure. With these shortcomings, a third group emerges which investigate ELG hypothesis through cointegration and causality test.

Most of the studies using causality approach are based on Granger (1969) work. According to this approach, ***Y*** causes ***X*** if relevant past information predicts ***X*** better than when past information except ***Y*** is used. Causality among variables is tested when cointegration is confirmed among the variables.

Cointegration test is used to check the long-run association. Two commonly used techniques of cointegration analysis are: a) Engel-Granger cointegration; and, b) Johansen cointegration test. The Engel-Granger cointegration test can be applied for only two series. If series of interest are more than two, then Johansen cointegration approach is followed. On the other side the Johansen test is applicable only if the order of integration of all the variables is same maximum (I). If the order of integration of all the series is not the same, then the Autoregressive Distributed Lag (ARDL) approach or bounds test is followed.

4.2 AGGREGATE PRODUCTION FUNCTION (APF)

The standard Aggregate Production Function (APF) model has been widely used in empirical studies to explore the trade (or exports) growth nexus. The APF model assumes that along with basic factors like labor and capital other factors like exports can also be used in order to capture their respective contribution in the growth model. The justification of including exports in the production function as an additional variable have the following reasons as presented by Emery (1967). Firstly, export promotion helps the exporting country to reallocate resources in those sectors that have comparative advantage which in turn enhance productivity of the sector. Secondly, economies of scale can be achieved in the export sector due to larger international market. Thirdly, competitions in the international market force the home market to reduce inefficiency in the export sector by adopting more efficient techniques. Finally, more exports would make available more resources to import both human and physical capital for the exporting country.

The basic APF model can be derived as follows;

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

where Y_t stands for the real GDP, A_t represents TFP, while K_t and L_t are the capital stock and total labor force in the economy at time t respectively. Exports contribute in economic growth through TFP i.e. A_t. Since this study intends to investigate impact of exports in growth, it is supposed that TFP is a function of exports, imports of capital goods, final consumption expenditures and other exogenous factors C_t. Thus TFP can be written as

$$A_t = f(X_t, MK_t, FCE_t, C_t)$$

$$A_t = X_t^{\gamma} MK_t^{\Phi} FCE^{\pi} C_t \quad (2)$$

Where X_t represents total exports, MK_t denotes imports of capital goods, and $\mathbf{FCE}_t$ denotes final consumption expenditures. Now combining both equations we get

$$Y_t = C_t K_t^{\alpha} L_t^{\beta} X_t^{\gamma} MK_t^{\Phi} FCE^{\pi} \quad (3)$$

Where $\alpha, \beta, \gamma, \varphi$ and π represent elasticity of output with respect to capital, labor, exports, imports of capital goods and final consumption expenditures respectively. Talking log of equation (3) we get;

$$\ln Y_t = C_t + \alpha \ln K_t + \beta \ln L_t + \gamma \ln X_t + \Phi \ln MK_t + \pi FCE_t + \varepsilon_t \quad (4)$$

where all variables and coefficients are already explained.

4.3 ARDL Model Specification

Following Pesaran et al., (2001), the vector autoregression (VAR) of order *p*, can be constructed as follows;

$$z_t = c_o + \beta t + \sum_{i=1}^{p} \phi_i z_{t-1} + \varepsilon_t \qquad (4.1)$$

where $\mathbf{Z_t}$ is the vector of variables like $\boldsymbol{x_t}$ and $\boldsymbol{y_t}$. $\boldsymbol{y_t}$ represents real GDP and is used as dependent variable, and $\boldsymbol{x_t} = [\boldsymbol{K_t}, \boldsymbol{L_t}, \boldsymbol{X_t}, \boldsymbol{MK_t}, \boldsymbol{FCE}]$ is the vector of five variables namely: Physical capital stock ($\boldsymbol{K_t}$), labor force ($\boldsymbol{L_t}$), real exports ($\boldsymbol{X_t}$), imports of capital goods ($\boldsymbol{MK_t}$) and final consumption expenditure ($\mathbf{FCE}$), $\boldsymbol{t}$ is time variable. According to Pesaran *et al.* (2001), $\boldsymbol{y_t}$ variable must be I(1), while $\boldsymbol{x_t}$ variable can be I(0) or I(1). The Vector error correction model (VECM) can be written as;

$$\Delta z_t = \mu + \alpha t + \lambda z_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta Y_{t-i} + \sum_{i=0}^{p-1} \gamma_i \Delta x_{t-i} + \varepsilon_t \qquad (4.2)$$

The long-run multiplier is then partitioned in matrix λ as:

$$\lambda = \begin{matrix} \lambda_{yy} & \lambda_{yx} \\ \lambda_{xy} & \lambda_{xx} \end{matrix}$$

The unrestricted ECM can be stated as;

$$\begin{aligned} \boldsymbol{\Delta \ln Y_t} &= \boldsymbol{\beta_o + \beta_1 \ln Y_{t-1} + \beta_2 \ln K_{t-1} + \beta_3 \ln L_{t-1} + \beta_4 \ln X_{t-1} + \beta_5 \ln MK_{t-1}} \\ &+ \boldsymbol{\beta_6 \ln FCE_{t-1}} + \sum_{i=1}^{p} \beta_7 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_8 \Delta \ln K_{t-i} + \sum_{i=0}^{r} \beta_9 \Delta \ln L_{t-i} \\ &+ \sum_{i=0}^{s} \beta_{10} \Delta \ln X_{t-i} + \sum_{i=0}^{v} \beta_{11} \Delta \ln MK_{t-i} + \sum_{i=0}^{w} \beta_{12} \Delta \ln FCE_{t-i} + \varepsilon_t \end{aligned} \qquad (4.3)$$

Equation (4.3) represents ARDL of order (*p, q, r, s, v, w)*. The lags structure are determined using Akaike Information Criteria (AIC). After regression of Equation (4.3), the long-run relationship among the variables is confirmed through Wald test. In Wald test, restrictions are imposed on the long-run coefficients of all variables with the following null and alternative hypotheses;

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ (no long-run relationship)

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$ (a long-run relationship exists)

The computed *F*-statistic is compared with its critical values. There are two critical values i) lower bound and ii) upper bound. If the calculated F-statistic falls below the lower bound, it is confirmed that no long-run relationship exits. On the other hand if it is higher than the upper bound, cointegration is confirmed among the variables. Moreover, if it falls between the two bounds, the decision is inconclusive.

The next step is to explore the dynamic short-run causality among the relevant variables. The lag level part of equation (4.3) is replaced by the lagged error correction term **(ET_{t-1})** and the short-run impact is represented by the lag differenced part as follow;

$$\Delta \ln Y_t = \beta_o + \sum_{i=1}^{p} \beta_7 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_8 \Delta \ln K_{t-i} + \sum_{i=0}^{r} \beta_9 \Delta \ln L_{t-i} + \sum_{i=0}^{s} \beta_{10} \Delta \ln X_{t-i} + \sum_{i=0}^{v} \beta_{11} \Delta \ln M K_{t-i} + \sum_{i=0}^{w} \beta_{12} \Delta \ln FCE_{t-i} + EC_{t-1} + \varepsilon_t \quad (4.4)$$

For causality running from GDP to exports, equation 4.4 can be written as;

$$\Delta \ln X_t = \beta_o + \sum_{i=0}^{p} \beta_7 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_8 \Delta \ln K_{t-i} + \sum_{i=0}^{r} \beta_9 \Delta \ln L_{t-i} + \sum_{i=1}^{s} \beta_{10} \Delta \ln X_{t-i} + \sum_{i=0}^{v} \beta_{11} \Delta \ln M K_{t-i} + \sum_{i=0}^{w} \beta_{12} \Delta \ln FCE_{t-i} + EC_{t-1} + \varepsilon_t \quad (4.5)$$

Where $\beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}$ *and* β_{12} are the short-run coefficients, and **EC** is the error correction term.

In the second part of estimation, the aggregate exports are bifurcated into i) agricultural exports and ii) non-agricultural exports. Therefore, equations 4.3 to 4.5 can be written as;

$$\Delta \ln Y_t = \beta_o + \beta_1 \ln Y_{t-1} + \beta_2 lnK_{t-1} + \beta_3 lnL_{t-1} + \beta_4 lnAX_{t-1} + \beta_5 lnNX_{t-1} + \beta_6 \ln M K_{t-1} + \beta_7 lnC_{t-1} + \sum_{i=1}^{p} \beta_8 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_9 \Delta lnK_{t-i} + \sum_{i=0}^{r} \beta_{10} \Delta lnL_{t-i} + \sum_{i=0}^{s} \beta_{11} \Delta \ln A X_{t-i} + \sum_{i=0}^{v} \beta_{12} \Delta \ln N X_{t-i} + \sum_{i=0}^{w} \beta_{13} \Delta \ln M K_{t-i} + \sum_{i=0}^{z} \beta_{14} \Delta lnC_{t-i} + EC_{t-1} + \varepsilon_t \quad (4.6)$$

$$\Delta \ln Y_t = \beta_o + \sum_{i=1}^{p} \beta_8 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_9 \Delta lnK_{t-i} + \sum_{i=0}^{r} \beta_{10} \Delta lnL_{t-i} + \sum_{i=0}^{s} \beta_{11} \Delta \ln A X_{t-i} + \sum_{i=0}^{v} \beta_{12} \Delta \ln N X_{t-i} + \sum_{i=0}^{w} \beta_{13} \Delta \ln M K_{t-i} + \sum_{i=0}^{z} \beta_{14} \Delta lnC_{t-i} + EC_{t-1} + \varepsilon_t \quad (4.7)$$

$$\Delta lnAX_t = \beta_o + \sum_{i=0}^{p} \beta_8 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_9 \Delta lnK_{t-i} + \sum_{i=0}^{r} \beta_{10} \Delta lnL_{t-i} + \sum_{i=1}^{s} \beta_{11} \Delta \ln A X_{t-i} + \sum_{i=0}^{v} \beta_{12} \Delta \ln N X_{t-i} + \sum_{i=0}^{w} \beta_{13} \Delta \ln M K_{t-i} + \sum_{i=0}^{z} \beta_{14} \Delta lnC_{t-i} + EC_{t-1} + \varepsilon_t \quad (4.8)$$

$$\Delta lnNX_t = \beta_o + \sum_{i=0}^{p} \beta_8 \Delta \ln Y_{t-i} + \sum_{i=0}^{q} \beta_9 \Delta lnK_{t-i} + \sum_{i=0}^{r} \beta_{10} \Delta lnL_{t-i} + \sum_{i=0}^{s} \beta_{11} \Delta \ln A X_{t-i} + \sum_{i=1}^{v} \beta_{12} \Delta \ln N X_{t-i} + \sum_{i=0}^{w} \beta_{13} \Delta \ln M K_{t-i} + \sum_{i=0}^{z} \beta_{14} \Delta lnC_{t-i} + EC_{t-1} + \varepsilon_t \quad (4.9)$$

Where AX denotes exports of agricultural goods and NX represents exports of non-agricultural goods. All other variables are the same as explained in equation 4.1.

To explore the causality between agricultural GDP and agricultural exports, the ARDL-ECM is specified as follows;

$$\Delta \ln Yg_t = \pi_o + \sum_{i=1}^{p} \pi_1 \Delta \ln Yg_{t-i} + \sum_{i=0}^{q} \pi_2 \Delta lnAX_{t-i} + \beta_1 lnYg_{t-1} + \beta_2 lnAX_{t-1} + \varepsilon_t \quad (4.10)$$

Where **Yg** is agricultural GDP and **AX** is agricultural exports. Introducing the error correction term, the equation 5.7 can be written as follows;

$$\Delta \ln Yg_t = \pi_o + \sum_{i=1}^{p} \pi_1 \Delta \ln Yg_{t-i} + \sum_{i=0}^{q} \pi_2 \Delta lnAX_{t-i} + \Upsilon_1 EC_{t-1} + \varepsilon_t \quad (4.11)$$

$$\Delta \ln AX_t = \pi_o + \sum_{i=1}^{p} \pi_1 \Delta \ln Yg_{t-i} + \sum_{i=1}^{q} \pi_2 \Delta lnAX_{t-i} + \Upsilon_2 EC_{t-1} + \varepsilon_t \quad (4.12)$$

4.4 Data Description

From equation (4) $\boldsymbol{Y_t}$ is defined as real GDP (GDP in Constant Local Currency Unit); $\boldsymbol{K_t}$ is the capital stock at time ***t.*** Capital stock data are not available from secondary sources. The series is proxied by Gross Fixed Capital Formation . $\boldsymbol{L_t}$ is the total labor force of the country. $\boldsymbol{X_t}$, $\boldsymbol{MK_t}$**,** and $\mathbf{FCE_t}$ represent the volume of aggregate exports, imports of capital goods and final consumption expenditures measured in constant LCU sourced from WDI. Following Riezman et al (1996), the validity of analysis of any export-led growth hypothesis should take into account the role of imports. Imports are used not only as intermediate inputs in exports but also play its role to recover and stabilize the economy in case of external disequilibria. Moreover, this study uses imports of capital goods as a control variable in the study. The yearly data series is sourced from combination of FAO and WDI.

This study employs secondary level data for the time span starting from 1972 to 2019. The choice of time frame for estimation is based on the fact that partition of the country occurred in 1971. Non-availability of consistent time series data is completed by simple extrapolation method by taking 5 years annual growth rate of the adjacent available years. Although, primary objective of this analysis is to explore the impact of export on the country's performance, this study has incorporated a number of other variables to enhance the sustainability of the model. These time

series variables include Gross Domestic Product (GDP), Gross Fixed Capital Formation (GFCF), labor force, aggregate exports, imports of capital goods and final consumption expenditures. All variables are converted into logarithmic form in order to make variances in the data relatively low and to represent coefficients of explanatory variables as elasticities. The principal data sources are WDI, FAO statistics and Economic Surveys of Pakistan. These variables have been included in the study based on the following arguments.

4.4.1 GDP

In this study, GDP is taken as dependent variable which is proxied for the country prosperity. Time series data for GDP is available in constant LCU term from 1972 onward. The principal source is World Development Indicator. The series is denoted as LY in this study.

4.4.2 Physical Capital Stock

Physical capital stock data is not available from secondary sources. The series is proxied by GFCF data and is used widely in research studies. The neo-classical theory argues that higher the stock of capital higher will be the output of the economy. Therefore, the expected sign of capital stock would be positive. Capital stock is denoted by LK in the analysis. The source of this variable is WDI.

4.4.3 Labor force

Labor force, denoted by LL, represents the total labor force of the country. As an important input in neo-classical theory, labor force is expected to impact GDP positively. The intensity of impact of labor force variable depends on skills and training of the labor force. The primary sources of labor force are various editions of Labor Force Survey and Economic Survey of Pakistan. However, this study sourced the data from WDI.

4.4.4 Exports

Exports represents export of goods and non-factor services of Pakistan and is denoted by LX. Balassa (1985) argues that generally the sector involves in producing goods for export is relatively more efficient than other sectors. Consequently, more investment is attracted in an efficient economic sector and ultimately lead to total productivity growth of the economy. Moreover, export expansion helps to pile up foreign exchange and thus finances import of capital goods which

further enhances economic growth. Therefore, export expansion has been considered as a significant catalyst in improving overall productivity and hence it will have positive impact on output growth. Export data is sourced from WDI in constant LCU.

4.4.5 Imports of Capital Goods

Imports have been used as an explanatory variable in the analysis of export and economic growth association. This is based on Riezman *et al* (1996) argument that imports are crucial in testing the export-led growth hypothesis in order to avoid spurious causality results. This study includes imports of capital goods in order to capture the role of exports in financing capital goods imports, which in turn foster economic growth. Secondly, capital goods imports are necessary inputs used in the domestic production and hence enhance exports of the country. Having its importance in productivity enhancement and production, the sign of imports of capital goods is expected to be positive.

4.4.6 Exports of Agricultural Goods

In the second part of export-led growth hypothesis, aggregate exports are split into agricultural and non-agricultural goods exports. This is based on Ghatak *et al* (1997) argument that it is imperative to disaggregate exports into different categories in order to get their respective role in the economic growth. Exports of agricultural goods is not available in constant LCU term. This series is constructed using FAO and WDI data. The FAO statistics report (i) total merchandise exports and (ii) total agricultural exports in US$ value. On the other hand, WDI data report total exports in constant LCU term. The series of agricultural goods exports is constructed as follows;

$$AX_{lcu} = \frac{X_{Ag}}{X_{tot}} * X_{lcu} \qquad (5)$$

Where AX_{lcu} represents agricultural goods exports in constant LCU term. X_{Ag} and X_{tot} denote agricultural goods exports and total merchandise exports in US$ term. X_{lcu} represents total exports in constant LCU. The variable of agricultural goods export may have positive effect on the country's output.

4.4.7 Exports of Non-agricultural Goods

Similar to agricultural goods exports series, this series is also not available in constant LCU term from any source. This series is constructed as follows;

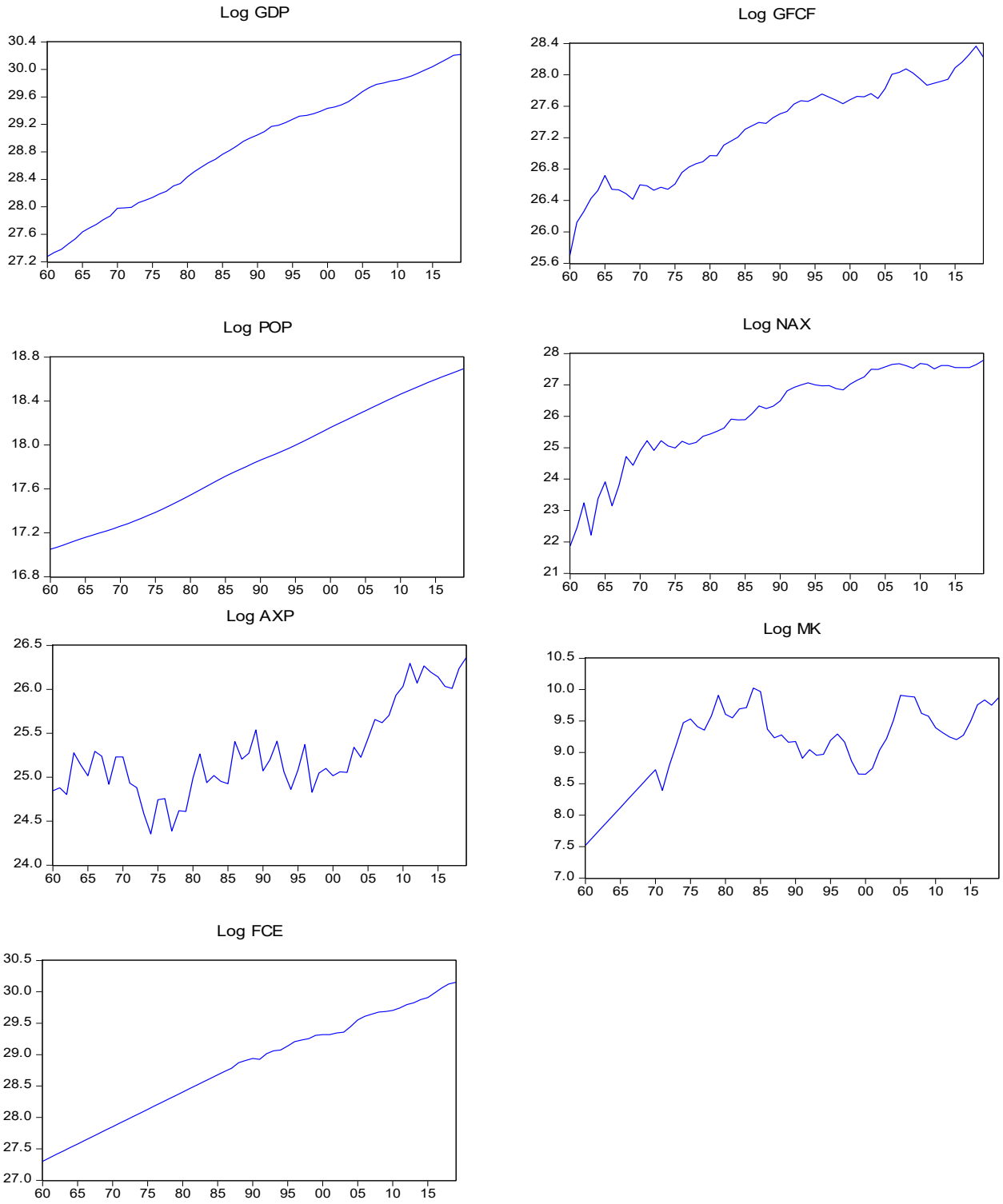
$$NX_{lcu} = X_{lcu} - AX_{lcu} \qquad (6)$$

Where NX_{lcu} denotes non-agricultural goods exports in constant LCU. X_{lcu} represents total exports in constant LCU and AX_{lcu} represent agricultural goods exports in constant LCU as constructed in equation (5). It is expected that it will contribute more to economic growth as compare to exports of agricultural goods and also have a positive sign. Summary statistics and graphs of logarithmic transformation of all the variables are reported in the following Table and in figure respectively.

Table 4.1: Summary statistics of the log transformed series

	Y	K	L	AXP	NAX	MK	FCE
Mean	28.88920	27.30868	17.84627	25.26657	26.05389	9.132158	28.80548
Median	29.02528	27.47724	17.84676	25.16996	26.40948	9.238960	28.91675
Maximum	30.21599	28.36614	18.69391	26.35844	27.78543	10.02451	30.15121
Minimum	27.27736	25.70023	17.04939	24.35360	21.87070	7.519692	27.30210
Std. Dev.	0.867403	0.644145	0.510244	0.502372	1.564864	0.618791	0.827829
Skewness	-0.228127	-0.382110	0.053770	0.643596	-0.914746	-0.826897	-0.187821
Kurtosis	1.826085	2.073248	1.709044	2.634322	3.016567	3.053226	1.857257
Jarque-Bera	3.965612	3.607254	4.195331	4.476456	8.368291	6.844676	3.617418
Probability	0.137682	0.164700	0.122743	0.106647	0.115235	0.092636	0.163866
Sum	1733.352	1638.521	1070.776	1515.994	1563.234	547.9295	1728.329
Sum Sq. Dev.	44.39089	24.48046	15.36059	14.89027	144.4791	22.59121	40.43274
Observations	48	48	48	48	48	48	48

Figure 4.1: Logarithmic transformation of the data



The Jarque-Berra test statistics show that all variables are distributed normally (Table 4.1). By pictorial examination of the variable in logarithmic form, Figure 4.1 show that most of the series are level non-stationary. However, this could be authentically confirmed through formal tests of unit root. Most of the series have upward trend throughout the sample period. However, significant fluctuations are observed in agricultural goods exports and import of capital goods.

Chapter-5

Estimation

Estimation1: Export-led Growth

5.1 Introduction

This chapter describes the econometric results of the impact of exports on economic growth of Pakistan. In the first part we explore the impact of overall exports on the economic growth of the economy using time series data for Pakistan. Bound testing or Auto Regressive Distributive Lag (ARDL) technique of cointegration, developed by Pesaran et al., (2001) , have been used to examine the long-run as well as short-run mechanism among the variables of interest. We also investigate the causal relationship among the variables specifically between exports of agricultural goods and agricultural GDP.

5.2 Results and Discussions

This section discusses estimation results by investigating the export-led growth hypothesis for Pakistan economy. After discussing time series properties of variables used in this analysis, the long-run and short-run relationship is established among variables of interest. Finally, causal relationship is investigated between exports and GDP.

5.2.1 Analysis of Aggregate exports and Output

This section deals with the analysis of the impact of aggregate exports on total output (GDP). Having a time series data, the study first looks into the unit root (Non-stationarity) properties of all the variables of interest one by one. Although the ARDL approach does not require to check the unit root test of the variables as it can be used in the case where variables are either purely integrated of order zero (i.e. stationary at level) and integrated of order one (i.e. stationary at after taking first difference) or of mix nature, but still we have to check it in order to confirm that no series is integrated of order two (i.e. stationary after taking 2^{nd} difference). ARDL technique of cointegration crashes in the presence of variable which is integrated of order two I(2). Hence the

unit roots or the order of integration and univariate time series properties of each of the time series data involved in modeling is first investigated.

5.2.1.1 *Integration properties of the variables*

This study uses Augmented Dickey-Fuller (ADF) test to investigate order of integration of the variables. There are three options in equation of ADF test; whether to include constant term only, or to include both constant and time trend or exclude both constant and time trend. These equations are given below.

(i) $$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \sum_{i=1}^{m}(\alpha_i \Delta y_{t-i}) + \varepsilon_i$$

(ii) $$\Delta y_t = \beta_1 + \delta y_{t-1} + \sum_{i=1}^{m}(\alpha_i \Delta y_{t-i}) + \varepsilon_i$$

(iii) $$\Delta y_t = \delta y_{t-1} + \sum_{i=1}^{m}(\alpha_i \Delta y_{t-i}) + \varepsilon_i$$

The null hypothesis in ADF test is given below;

$H_0 : \delta = 0$

$H_1 : \delta < 0$

Table 4.4 reports the ADF test results.

Table 5.1: Unit root tests on variables

Variable	***Level***		***First Difference***	
	SIC lags	**Test statistic**	**SIC lags**	**Test statistic**
LY	0	-1.459	0	-6.364***
LK	1	-2.608	2	-7.235**
LL	0	-3.25*	-	-
LC	0	-1.605	0	-5.757***
LX	0	-1.939	0	-8.063***
LMK	1	-2.648	0	-5.512***

Key: LY = log of total output, LK = log of total physical capital stock, LL = log of total population ages 15-64 years, LC= log of Final Consumption expenditure, LX = log of total exports, LMK = log of import of capital stock.

***, **, and * represent significance at 1%, 5%, and 10% levels, respectively

The ADF tests shows that the order of integration of the variables of mixed nature. The lag-length of each variable is based on Schwarz Information Criterion (SIC) which is automatically selected by E-views 9.0. According to ADF results, one variable i.e. population ages 15-64 denoted by LL is integrated of order zero (i.e. series is stationary at level). The remaining variables i.e. GDP, stock of physical capital, total export, final consumption expenditures, and import of capital goods series are integrated of order one (i.e. become stationary after taking first differences). On the basis of ADF test that shows mixed order of integration of variables, we opt for using ARDL technique of cointegration instead of Johansen technique.

5.2.1.2 *Bounds test for Integration*

The ARDL procedure starts with the bound test to confirm the existence of long-run association among the variables. For the lag length of variables Akaike Information Criteria (AIC) is used. We use two models for bounds test. In one model, GDP is used as dependent variable and in the second model we use aggregate exports as dependent variable. Table 5.2 describes the bounds test results of the two models.

Table 5.2: Bounds test of the models

Model	***lags***	***F-Statistics***	***Significance Level***	***result***
F_Y [Y / K, L, X, MK, FCE]	3	4.22	1 %	Cointegration exists
F_X [X / Y, K, L, MK, FCE]	1	4.67	1 %	Cointegration exists

"Notes: Lower bound *I(0)*=2.82, and upper bound *I(1)*=4.21 at 1% significance level."

When GDP is used as dependent variable, the higher F-statistics from the upper bound confirm the existence of cointegration. Table 5.2 also reports F-statistics when export is used as dependent variable which also indicates the presence of long-run relationship among the variables. As we are mainly concerned in the role of exports on economic growth, we pursue the first model using GDP as dependent variable. Once it is confirmed that a long-run cointegration relationship exist among the variables, the long run coefficients are obtained using the ARDL (1, 3, 0, 3, 0, 3) specification. The results are reported in Table 5.3.

The estimated long-run coefficients show that physical capital has positive and significant impact (at 10%) on real GDP. A 1% increase in capital investment leads to approximately 0.1% increase in real GDP, all things being equal. The labour force variable is also positively related to GDP but highly insignificant.

Table 5.3: Long-run coefficients

Equation (4.3): ARDL(1, 3, 0, 3, 0, 3)				
Regressors	**Coefficient**	**Standard Error**	**t-ratio**	**t-probability**
lK_t	0.098*	0.057498	1.701031	0.0963
lL_t	0.107^{ns}	0.192429	0.558542	0.5794
lX_t	0.129^{***}	0.031606	4.104935	0.0002
lMK_t	0.023^{ns}	0.019290	1.184053	0.2430
LC_t	0.719^{***}	0.155285	4.631036	0.0000

"***, **, *, and ns denotes 1%, 5%, 10%, and non-significant levels, respectively"

Considering the impact of aggregate exports, it has the positive effect on GDP and is highly significant. A 1% increase in total exports of the economy leads to a 0.13 percent increase in economic growth. This study has also used dummy variable representing trade liberalization in 1990's (i.e. D = 0 before 1990-91 and D =1 after 1990-91) in the equation. Although the dummy variable show positive impact on GDP, however remain highly insignificant in all regressions. Moreover, the import of capital goods secured positive impact on economic performance of Pakistan economy. This is understandable because more capital goods enhance productivity of the labor force due to low capital stock existence in the economy like all other developing nations. Interestingly, the final expenditure consumption variable has very high coefficient and highly significant. The main reason behind the high coefficient of final consumption expenditure employ that Pakistan economy is consumption oriented and thus play a significant role in GDP growth.

The dynamic short-run coefficients of the model are reported in Table 5.4.

Table 5.4: Short-run coefficients of the model

Equation (4.4): ARDL(1, 3, 0, 3, 0, 3)				
Regressors	**Coefficient**	**Standard Error**	**t-ratio**	**t-probability**
D(LK)	0.111711	0.027475	4.065824	0.0002
D(LK(-1))	0.017895	0.036199	0.494338	0.6236
D(LK(-2))	-0.060896	0.022504	-2.705977	0.0098
D(LL)	0.035865	0.055453	0.646763	0.5213
D(LX)	0.088168	0.018141	4.860146	0.0000
D(LX(-1))	-0.048299	0.021749	-2.220744	0.0318
D(LX(-2))	0.045040	0.017729	2.540491	0.0149
D(LMK)	0.007622	0.005924	1.286613	0.2053
D(LC)	0.480785	0.104475	4.601923	0.0000
D(LC(-1))	-0.389656	0.139352	-2.796206	0.0078
D(LC(-2))	0.137919	0.098083	1.406145	0.1670
EC(-1)	-0.333689	0.121150	-2.754353	0.0087

EC = LY - (0.0978*LK + 0.1075*LL + 0.1297*LX + 0.0228*LMK + 0.7191*LC)

"The equilibrium correction coefficient, estimated -0.33 is highly significant, has the correct sign, and imply a fairly high speed of adjustment to equilibrium after a shock. Approximately 33 percent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year."

5.2.1.3 Causality Analysis

Causality is generally used to reflect the short-run behavior of the model. As the study has shown the long-run relationship among variables of interest through cointegration technique, it is therefore intended to consider the causal direction among variables. These results will confirm that which variable is a precondition for other variable and vice versa. In this section the causal relationship between GDP and exports in particular and among all variables in general is explored.

"If there is co-integration among the variables in bound testing approach, the Granger causality test needs to be done under vector error correction model (VECM). In this case, the short-run deviation of series from their long-run equilibrium can be captured by incorporating the error correction term (Narayan and Smyth, 2004). According to VECM for causality tests, the significant F and t ratio of the lagged error correction term (EC_{t-1}) would be enough condition that there is causality from exports to GDP and from GDP to exports in Equation 4.4 and Equation 4.5 respectively."

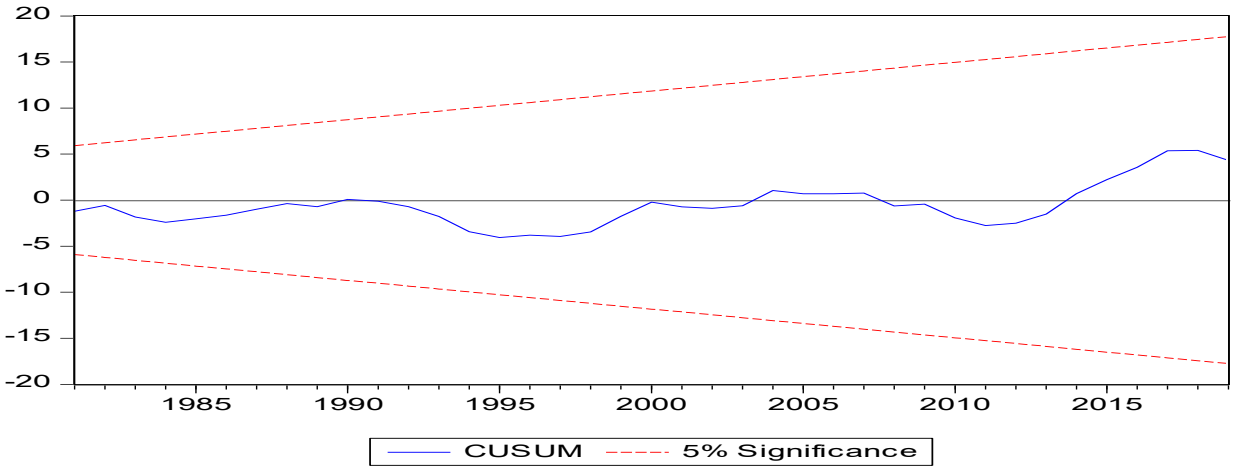
As mentioned above, according to VECM for causality tests, the significant F and t ratio of the lagged error correction term (EC_{t-1}) would be enough condition that there is causality from X to Y and from Y to X in Equation 4.4 and Equation 4.5 respectively. Therefore, highly significant lagged error term indicates that causality runs from aggregate exports to GDP. The export-led growth hypothesis is, therefore, confirmed for the economy of Pakistan. The equation 4.5 was also used to check causality from GDP to aggregate exports. It is also confirmed that causality run from GDP to aggregate exports. Hence it is concluded that there is bi-directional causality between GDP and aggregate exports, therefore, reinforcing each other.

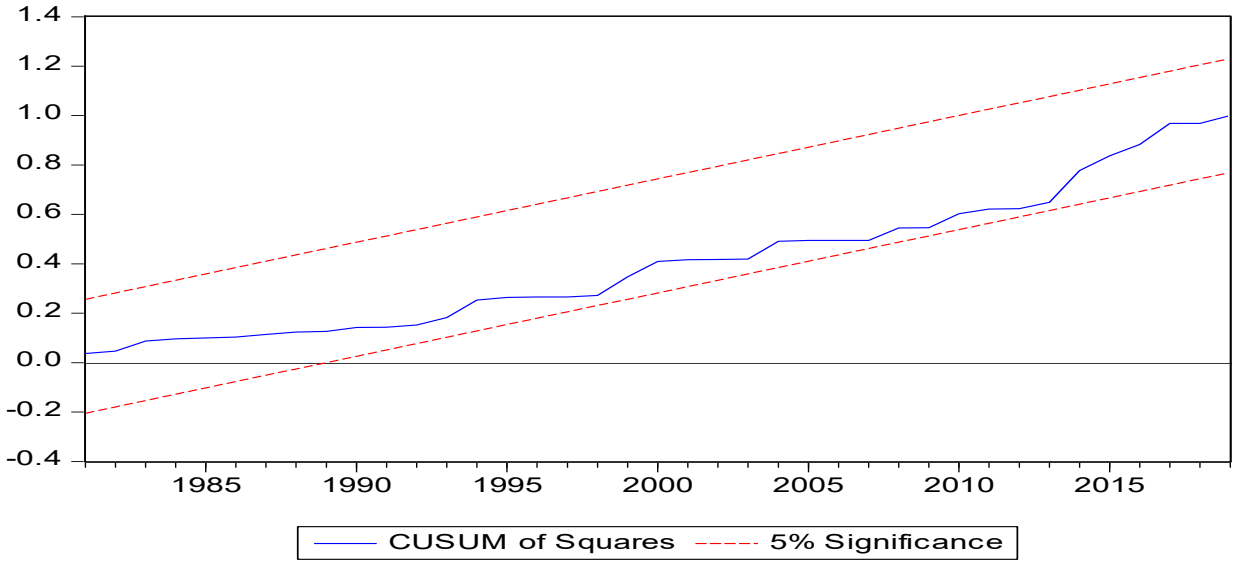
The ARDL regression model passes the diagnostic tests against serial correlation, non-normal errors and heteroskedasticity (Table 5.5). However, the heteroskedasticity test reveals that heteroskedasticity exists at 10 percent level. As series are integrated of mixed order, it is likely that heteroscedasticity may exist as highlighted by Shrestha and Chodhury (2005). The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) plots, showing CUSUM and CUSUMSQ statistics are well within the critical bounds, (figure 5.1) from a recursive estimation of the model also indicate stability in the coefficients over the sample period.

Table 5.5: ARDL-VECM Model Diagnostic Tests

LM Test statistics	**Test statistic**	**Probability**
Serial Correlation	0.579	0.564
Normality	1.090	0.579
Heteroskedasticity	1.775	0.073

Figure 5.1: Plot of CUSUM and CUSUMQ for coefficient stability for ECM model





5.2.2 Export-led growth at disaggregated level

With the exception of a few, majority of the studies focus on 'aggregate' real export only in the export-led growth hypothesis. Using aggregate real export in investigating export-growth nexus may mask important underlying differences among different export categories as stressed by Giles *et al*., (1993). Although, there are possibilities of export-growth nexus for certain groups of exports, this may not be revealed if export is used at aggregate level, hence spurious conclusion may be drawn. Giles *et al*., (1993) reject the ELG hypothesis at aggregate level, however, they find some support of it when they use certain export groups. Uk Polo (1994), investigating ELG hypothesis for African countries, finds support for a positive relationship between the growth of non-fuel primary exports and growth, nevertheless, they fail to find significant positive link of manufactured exports to economic growth of the low-income African countries. This study also suggests that a threshold level of development is critical for a positive link of manufactured goods export on economic growth. In this section, moving further, the study disaggregates total exports into agricultural goods and non-agricultural goods exports and explores its individual impact on GDP as well as its causal relationship.

5.2.2.1 Integration properties of the variables

This section deals with the analysis of the impact of disaggregate exports on total output (GDP). Having a time series data, the study first looks into the unit root properties of all the variables of interest. Although the ARDL approach does not require to check the unit root test of the variables as it can be used in the case where variables are either purely integrated of order zero (i.e. stationary at level) and integrated of order one (i.e. stationary at after taking first difference) or of mix nature, but still it is checked in order to confirm that no series is integrated of order two (i.e. stationary after taking 2^{nd} difference). ARDL technique of cointegration does not work when variables are integrated of order two I(2)

Using ADF unit root rest, Table 5.6 shows that all series are stationary at first difference except series of labor force which is statrionary at level. The table also confirms that none of the series are integrated of order 2. Moreover, the order of integration is of mixed order with maximum order of integration as 1. Therefore, in this case we cannot use Johansen integration test and we are left with only the ARDL option.

Table 5.6: ADF unit root tests on variables

Variable	*Level*		*First Difference*	
	AIC lags	**Test statistic**	**AIC lags**	**Test statistic**
LY	0	-1.459	0	-6.364***
LK	1	-2.608	2	-7.235**
LL	0	-3.25*	-	-
LAX	0	-2.717	1	-8.562***
LNX	4	-2.085	3	-3.104**
LC	0	-1.605	0	-5.757***
LMK	1	-2.648	0	-5.512***

Key: LY = log of total output, LK = log of gross fixed capital formation, LL = log of labor force, LAX = log of agricultural goods exports, LNX = log of exports of non-agricultural goods, LMK = log of import of capital stock and LC = log of Final Consumption expenditures

Note: ****, **, and * denotes significance level at 1%, 5%, and 10%, respectively.*

[a] *SIC (Schwarz Information Criteria) lag length is selected automatically by E-views 9.0*

5.2.2.2 Bound test for cointegration

Following the same steps taken in section 5.2.1, the presence of long-run relationships among the variables is examined using equation (1). Total exports are disaggregated into exports of agricultural goods (**A*X***) and exports of non-agricultural goods (**N*X***). Table 5.6 reports the results of the calculated F-statistics when GDP is considered as a dependent variable (normalized) in the ARDL-OLS regressions.

When GDP is used as dependent variable, the higher F-statistics from the upper bound confirm the existence of cointegration. Table 5.7 also reports F-statistics when export at disaggregate level is used as dependent variable which also indicates the presence of long-run relationship among the variables. As we are mainly concerned in the role of exports at disaggregate level on economic growth, we pursue the first model using GDP as dependent variable.

Table 5.7: Results from bounds test

Dependent variable	***AIC lags***	***F-Statistics***	***Significance level***	***Outcome***
F_Y [Y | K, L, AX, NX, MK, C]	3	5.18	1 %	Cointegration exists
F_{AX} [AX | Y, K, L, NX, MK, C]	1	4.41	5 %	Cointegration exists

"Notes: Lower bound *I(0)*=3.15, and upper bound *I(1)*=4.43 at 1% significance level (for F_Y [Y | K, L, AX, NX, MK, C]) . Lower bound *I(0)*=2.45, and upper bound *I(1)*=3.61 at 5% significance level (for F_{AX} [AX | Y, K, L, NX, MK, C])."

Once it is confirmed that a long-run cointegration relationship exist among the variables, the long run coefficients are obtained using the ARDL (1, 3, 0, 3, 0, 3) specification. The results are reported in Table 5.7.

The estimated coefficients of the long-run relationship show that capital has a high and significant (at 1%) impact on GDP. A 1 percent increase in the capital leads to approximately 0.23 percent increase in real GDP, all things being equal. Being a less developed country with low level of capital stock, this higher coefficient is understandable because marginal physical product of capital stock is still high. Thus, to enhance the output level of the economy, Pakistan needs more physical capital stock. The long-run impact of labor force on the country's GDP is also high and very significant. Coefficient of labor force shows that 1 percent increase in labor force enhances 0.24 percent increase in national GDP.

Table 5.7: The long-run coefficients of the model taking GDP as dependent

Equation (3): ARDL(1, 3, 0, 0, 3, 0, 2)				
Regressors	**Coefficient**	**Standard Error**	**t-ratio**	**t-probability**
Constant	-1.419***	0.512	-2.77	0.008
IK	0.228***	0.094	4.611	0.001
II	0.242**	0.108	2.249	0.029
IAX	0.017ns	0.014	1.259	0.215
LNX	0.049***	0.019	2.563	0.014
IMK	0.008ns	0.012	0.653	0.517
LC	0.626***	0.099	6.319	0.002

"Note: ***, **, *, and ns denotes statistical significance at 1%, 5%, 10%, and non-significant respectively"

Considering the impact of disaggregated exports, the impact of agricultural goods export on output level is although positive but highly insignificant. The positive impact of agricultural goods exports suggests that Pakistan needs to enhance agricultural goods export in order to get GDP growth, however, there is need of thorough investigation about the composition of agricultural goods exports. On the other hand, coefficient of exports of non-agricultural goods is positive and highly significant. One percent increase in the export of non-agricultural goods enhances output level by approximately 0.05 percent. Therefore, Pakistan needs to improve value addition to its exportable goods rather than to export primary commodities. Its resources need to be shifted accordingly from primary commodities export sector to value added goods export sector.

The coefficient of capital goods imports is positive but highly insignificant which is quite alarming. One percent increase in capital goods imports results into approximately 0.01 percent increase in output level. One of the possible explanations of this may be that majority of the labor force of the country are either unskilled or semi-skilled. More capital goods enhance the productivity of labor force with skills and education, resulting into more demand and hence increase in the output level. All this demand enhancing education and skills level of labor force of the country. The coefficient of Final Consumption expenditure is substantially high and highly significant. One percent increase in final consumption expenditure brings about approximately 0.63 percent increase in GDP level of Pakistan. The dynamic short-run coefficients of the model are given in Table 5.8.

The equilibrium correction coefficient, estimated -0.552 is highly significant, has the correct sign, and imply a fairly high speed of adjustment to equilibrium after a shock. Approximately 55 percent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year.

Table 5.8: The short-run coefficients of the model

Equation (4): ARDL(*1, 3, 0, 0, 3, 0, 2*)				
Regressors	**Coefficient**	**Standard Error**	**t-ratio**	**t-probability**
ΔlK	-0.079	0.029	-2.713	0.009
Δll	0.134	0.069	1.949	0.058
ΔlAX	0.009	0.008	1.196	0.238
ΔlNX	0.035	0.012	3.041	0.004
ΔlMK	0.004	0.006	0.706	0.484
ΔlC	0.420	0.101	4.170	0.002
EC(-1)	-0.552***	0.126	-4.386	0.000

Cointegrating equation: EC = ly - (0.2279*LK + 0.2419*LL + 0.0173*LAX + 0.0488*LNX + 0.0082*LMK + 0.6260*LC - 1.4196)

5.2.2.3 Causality Analysis

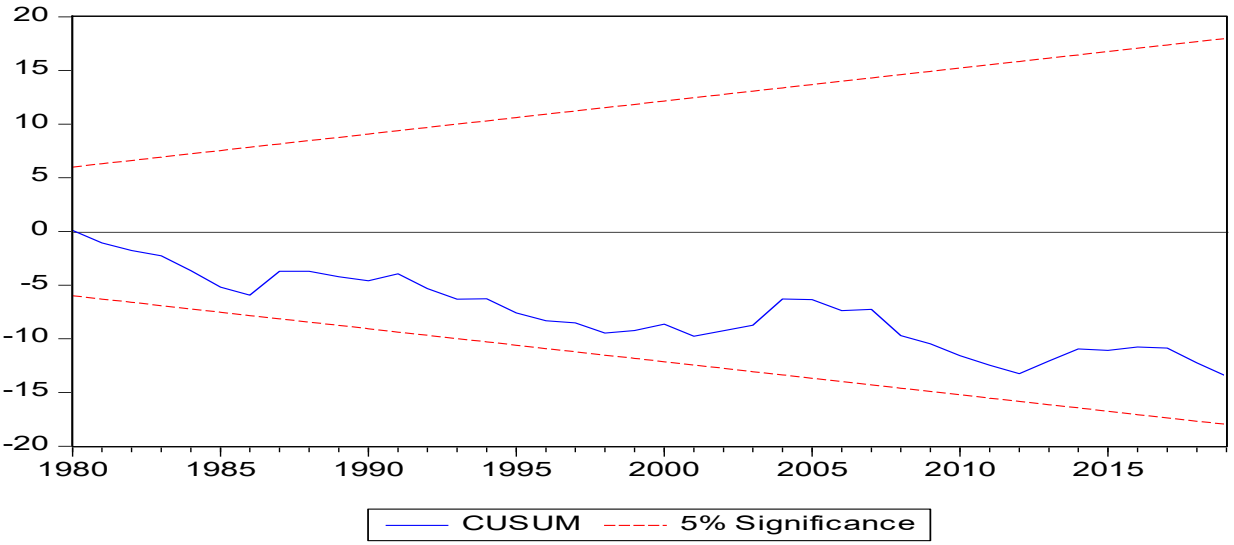
As mentioned above, according to VECM for causality tests, the significant F and t ratio of the lagged error correction term (EC_{t-1}) would be enough condition that there is causality from exports to GDP and from GDP to exports in Equation 5.4 and Equation 5.5 respectively. Therefore, highly significant lagged error term (EC_{t-1}) with correct sign indicates that causality runs from exports of non-agricultural goods to GDP (Table 5.8). The export-led growth hypothesis is, therefore, confirmed for the economy of Pakistan. The study also used equation 5.6 to check causality from GDP to exports of non-agricultural goods; the significance of lagged error correction term implied that causality also run from GDP to exports of non-agricultural goods. Hence it is concluded that there is bi-directional causality between GDP and exports of non-agricultural goods. Therefore, growth in GDP and non-agricultural exports reinforce each other.

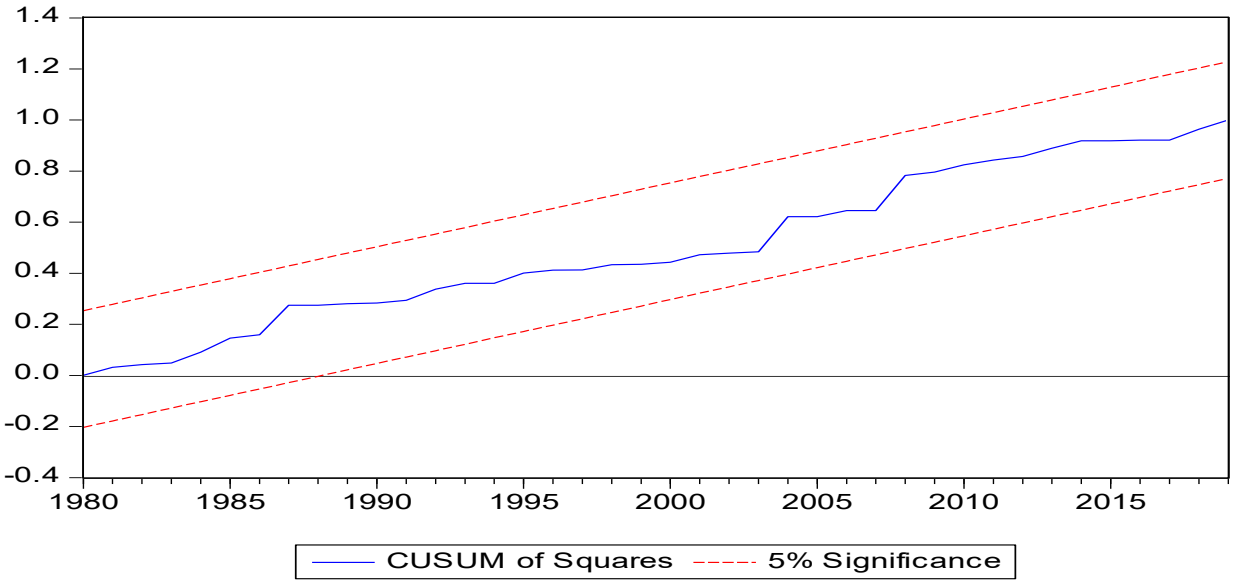
Table 5.9: ARDL-VECM Model Diagnostic Tests

LM Test statistics	**Test statistic**	**Probability**
Serial Correlation	1.707	0.1946
Normality	1.443	0.486
Heteroskedasticity	0.952	0.518

The ARDL regression model passes the diagnostic tests against serial correlation, non-normal errors and heteroskedasticity (Table 5.9). The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) plots, showing CUSUM and CUSUMSQ statistics are well within the critical bounds, (figure 5.2) from a recursive estimation of the model also indicate stability in the coefficients over the sample period.

Figure 5.2: Plot of CUSUM and CUSUMQ for coefficient stability for ECM model





5.2.3 Causality between Agricultural exports and Agricultural GDP

This section explores causality between agricultural exports and agricultural GDP. As argued by Engle and Granger (1987), if two or more variables are cointegrated, the standard causality approach will lead to misleading results because of omitting important level terms. Therefore, in case of cointegration, Granger causality test can be used through error correction.

5.2.3.1 Bound test for cointegration

Following the same steps taken in section 5.6.1, the presence of long-run relationships among the variables is examined. Table 5.10 reports the results of the calculated F-statistics when agricultural GDP is considered as a dependent variable in the ARDL-OLS regressions.

The calculated F-statistics F_{Yg} [Yg | AX] = 11.91 is higher than the upper bound critical value at the 1 per cent level. Thus, the null hypothesis of no cointegration is rejected i.e. confirm cointegration among the variables. We also check bound test when Agricultural export is used as dependent variable which does not confirm long-run relationship between the variable of interest.

Table 5.10: Results from bounds test on equation (5.7)

Dependent variable	***AIC lags***	***F-Statistics***	***Significance level***	***Outcome***
F_{Yg} [Yg | AX]	4	11.91	1 %	Cointegration exists
F_{AX} [AX | Yg]	4	2.35		No Cointegration exists

Notes: Lower bound *I(0)*=3.15, and upper bound *I(1)*=4.43 at 1% significance level (for F_{Yg} [Yg | AX]) . Lower bound *I(0)*=3.15, and upper bound *I(1)*=4.11 at 5% significance level (for F_{AX} [AX | Yg]).

The long run coefficient of agricultural exports was positive and highly significant. A one percent increase in agricultural exports increase agricultural output 1.18 percent.

The dynamic short-run coefficients of the model are given in Table 5.11.

The equilibrium correction coefficient, estimated -0.041 is significant, and imply a speed of adjustment of about 4 percent after a shock. This also confirms the uni-directional causality running from agricultural exports to agricultural GDP.

Table 5.11: Error correction for the selected ARDL model

Equation (4): ARDL(4, 0)				
Regressors	**Coefficient**	**Standard Error**	**t-ratio**	**t-probability**
D(LYG(-1))	-0.623145	0.141367	-4.408003	0.0001
D(LYG(-2))	-0.423940	0.173911	-2.437684	0.0183
D(LYG(-3))	-0.378506	0.210157	-1.801068	0.0776
D(LAX)	0.048291	0.026019	1.856023	0.0692
EC(-1)	-0.040966	0.023711	-1.727729	0.0401

Cointegrating equation: EC= LYG - (1.1788*LAX)

Chapter-6
Conclusions and Policy Recommendations

An extensive literature exists related to the sources or factors that play potential role in the growth process. For example, the endogenous growth theory argues that the main sources of economic growth are trade and human capital. However, controversies exist among researchers regarding the favorable role of trade and other factors in the economic growth process. Among the main economic growth determinants, trade is one of the main factors that has been widely discussed in recent growth literature. The crux of the debate has been whether the countries that keep their economies open to foreign trade can grow faster. The primary focus of this study is to explore whether more export can foster economic growth of Pakistan. In order to achieve these objectives, export-led growth hypothesis at aggregate and disaggregate level for Pakistan has been analyzed in the study.

Autoregressive Distributed Lag (ARDL) model approach was used in this study to explore the hypothesis using 48 years time series data from 1972-2019. Initially, data on exports at aggregate level was used and the results confirmed export-led growth hypothesis for Pakistan. The causality between GDP and aggregate exports was also conducted and the study found two way causality between the two variables. Later on, exports were decomposed into agricultural goods and non-agricultural goods exports to find the export-led growth at disaggregate level. In the last section We also explore the causal relationship between agricultural exports and agricultural GDP to find the leading role of agricultural sector exports on agricultural GDP.

6.1 Export-led Growth: Aggregate level

On the empirical front, several empirical studies have documented a positive as well as significant relationship between export growth and output growth. With the exception of a few, majority of the studies just focus on 'aggregate' real export in the export-led growth (ELG) hypothesis. Although majority of the empirical studies supported positive relation between trade (or exports) and GDP, however, some other studies are skeptical on this association.

The impact of aggregate exports on economic growth was examined through ARDL approach. Following the aggregate production function, a conceptual model was developed which incorporates aggregate exports and import of capital goods and final consumption expenditures to investigate export-led growth hypothesis. The order of integration of the sample variables were checked ADF unit root test. Some of these series were found stationary at level while others were integrated of order one. Having variables with different order of integration, this study used bound testing, popularly known as Autoregressive distributive lag (ARDL), cointegration technique.

The results revealed that aggregate exports have positive and significant impact on the country's economic growth. It has the expected positive impact on economic growth and is highly significant. A 1% increase in total exports of the economy leads to a 0.13 percent increase in economic growth. These results are consistent with Iqbal & Zahid (1998), Khan et al., (1995), Kemal et al., (2002), Quddus & Saeed (2005), Shiraz & Manap (2004). The findings of the study suggest that the government of Pakistan should concentrate on enhancing exports in order to get the country prosperous. Moreover, bi-directional causality was found between exports and GDP which implies that exports and GDP are closely associated with each other rather reinforcing each other.

6.2 Export-led Growth: Disaggregate level

In the second part, total exports were decomposed into agricultural and non-agricultural goods to examine their respective role in Pakistan's economic growth. Following the ARDL procedure, first the order of integration of all the variables were checked so that to confirm that none of the variables is I(2). Then through bound test, it was confirmed that series were cointegrated. The long-run coefficients were estimated in the next step. The results revealed that the impact of agricultural exports on overall GDP was positive but highly insignificant. On the other hand, coefficient of exports of non-agricultural goods was positive and highly significant. One percent increase in the export of non-agricultural goods enhances output level by approximately 0.05 percent. These results reinforce the notion of Ghatak et al (1997) that it is vital to decompose exports into various types of exports while investigating the export-led growth hypothesis of a country.

The VECM for causality tests indicate that causality runs from exports of non-agricultural goods to GDP as well as from GDP to non-agricultural goods exports. Hence it is concluded that there is bi-directional causality running from non-agricultural goods exports to GDP which suggests that country should enhance the exports of non-agricultural goods in order to get the country prosperous. Moreover, there is a need to diversify the country's exports across the world's markets as well as across products.

6.3 Policy implications

The policy implications for both the commodities may be different. For agricultural goods exports, we cannot suggest a clear-cut policy as the coefficient is statistically insignificant. However, further investigation is needed to decompose agricultural exports and find their respective role. In general, it is suggested that Pakistan needs to enhance value addition in agriculture sector exports. There is dire need to invest in food processing industry. Further, Therefore, Pakistan needs to improve value addition to its exportable goods rather than to export primary commodities. Its resources need to be shifted accordingly from primary commodities export sector to value added goods export sector.

As the analysis part show that exports of non-agricultural goods has performed better than the exports of agricultural commodities, Pakistan should give more attention to enhance the educational level of its labor force to be able to export value-added and high technology goods and services. Similarly, Pakistan has to improve its infrastructure to reduce costs associated with international trade. Hence Structure of exports can play a vital role in the growth process of both exports and income as suggested by. Similarly, diversification of exports would help to reduce the fluctuations in export earnings.

For future research, this study suggests that agricultural and non-agricultural goods may be further decomposed to highlight the role of specific group of exports on economic growth.

References

Agrawal, P. (2015). The role of exports in India's economic growth. *The Journal of International Trade & Economic Development*, *24*(6), 835-859.

Ahmad, D., & Ahmad, J. (2018). An empirical analysis of agricultural export on economic growth: A case study of Pakistan. *International Journal of Advanced and Applied Sciences*, *5*(2), 25-32.

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.

Akinlo, A. E. (2006). Macroeconomic factors and total factor productivity in sub-Saharan African countries. *International Research Journal of Finance and Economics, 1*, 62-79.

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

Amirkhalkhali, S., & Dar, A. A. (1995). A varying-coefficients model of export expansion, factor accumulation and economic growth: Evidence from cross-country, time series data. *Economic Modelling, 12*(4), 435-441.

Anwer, M. S., & Sampath, R. K. (2000). Exports and economic growth. *Indian Economic Journal, 47*(3), 79.

Awokuse, T. O. (2003). Is the export-led growth hypothesis valid for Canada? *Canadian Journal of Economics/Revue canadienne d'économique, 36*(1), 126-136.

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

Bahmani-Oskooee, M. (1993). Export growth and economic growth: An application of cointegration and error-correction modeling. *The Journal of Developing Areas, 27*(4), 535-542.

Baig, M. Q. (2009). *Pakistan's Trade Policy, 1999–2008: An Assessment*. Retrieved from

Balassa, B. (1978). Exports and economic growth: further evidence. *Journal of development Economics, 5*(2), 181-189.

Bakari, S., & Mabrouki, M. (2017). The effect of agricultural exports on economic growth in South-Eastern Europe: An empirical investigation using panel data. *Journal of Smart Economic Growth*, *2*(4), 49-64.

Balassa, B. (1981). The newly-industrializing developing countries after the oil crisis. *Review of World Economics, 117*(1), 142-194.

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.

Baldwin, R. (1989). *Measureable Dynamic Gains from Trade*. Retrieved from

Barro, R. J., & Sala-i-Martin, X. (1995). *Economic growth*. New York ; London: McGraw-Hill.

Barro, R. J., & Sala-i-Martin, X. (1995). Economic growth, 1995. *McGraw0Hill, New York*.

Ben-David, D. (1993). Equalizing exchange: Trade liberalization and income convergence. *The quarterly journal of economics*, 653-679.

Burney, N. A. (1996). Exports and economic growth: evidence from cross–country analysis. *Applied Economics Letters, 3*(6), 369-373.

Caporale, G. M., Hassapis, C., & Pittis, N. (1998). Unit roots and long-run causality: investigating the relationship between output, money and interest rates. *Economic Modelling, 15*(1), 91-112.
Caporale, G. M., & Pittis, N. (1997). Causality and forecasting in incomplete systems. *Journal of Forecasting, 16*(6), 425-437.
Cass, D. (1965). Optimum growth in an aggregative model of capital accumulation. *The Review of Economic Studies, 32*(3), 233-240.
Chou, W. L., & Wong, K. y. (2001). Economic growth and international trade: the case of Hong Kong. *Pacific Economic Review, 6*(3), 313-329.
Chow, P. C. (1987). Causality between export growth and industrial development: Empirial evidence from the NICs. *Journal of development Economics, 26*(1), 55-63.
Christopoulos, D. K. (2007). Explaining country's efficiency performance. *Economic Modelling, 24*(2), 224-235.
Chuang, Y.-c. (2000). Human capital, exports, and economic growth: a causality analysis for Taiwan, 1952-1995. *Review of international economics, 8*, 712-720.
Coe, D. T., & Helpman, E. (1995). International r&d spillovers. *European economic review, 39*(5), 859-887.
Darrat, A. F. (1987). Are exports an engine of growth? Another look at the evidence. *Applied Economics, 19*(2), 277-283.
Dawson, P. J. (2005). Agricultural exports and economic growth in less developed countries. *Agricultural economics*, *33*(2), 145-152.
Dawson, P. J. (2006). The export–income relationship and trade liberalisation in Bangladesh. *Journal of Policy Modeling, 28*(8), 889-896.
De Gregorio, J. (1992). Economic growth in latin america. *Journal of development Economics, 39*(1), 59-84.
Din, M.-U., Ghani, E., & Siddique, O. (2003). Openness and economic growth in Pakistan. *The Pakistan Development Review*, 795-807.
Dodaro, S. (1993). Exports and growth: A reconsideration of causality. *The Journal of Developing Areas*, 227-244.
Dollar, D. (1992). Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985. *Economic development and cultural change, 40*(3), 523-544.
Domar, E. D. (1946). Capital expansion, rate of growth, and employment. *Econometrica, Journal of the Econometric Society*, 137-147.
Doyle, E. (1998). Export-output causality: The Irish case 1953–93. *Atlantic Economic Journal, 26*(2), 147-161.
Edeme, R. K., Ifelunini, I. A., & Nkalu, N. C. (2016). A comparative analysis of the impact of agricultural exports on economic growth of ECOWAS countries. *Acta Oeconomica Pragensia*, *24*(5), 31-46.
Edwards, S. (1992). Trade orientation, distortions and growth in developing countries. *Journal of development Economics, 39*(1), 31-57.
Edwards, S. (1998). Openness, productivity and growth: what do we really know? *The economic journal, 108*(447), 383-398.
Emery, R. F. (1967). The relation of exports and economic growth. *Kyklos, 20*(4), 470-486.
Faridi, M. Z. (2012). Contribution of agricultural exports to economic growth in Pakistan. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *6*(1), 133-146.

Fatemah, A., & Qayyum, A. (2018). Modeling the impact of exports on the economic growth of Pakistan. *Turkish Economic Review*, *5*(1), 56-64.

Feder, G. (1983). On exports and economic growth. *Journal of development Economics, 12*(1-2), 59-73.

Frankel, J. A., Romer, D., & Cyrus, T. (1996). *Trade and growth in East Asian countries: cause and effect?* Retrieved from

Fugarolas, G., Manalich, I., & Matesanz, D. (2007). Are exports Causing Growth? Evidence on International Trade Expansion in Cuba, 1960-2004.

Ghatak, S., Milner, C., & Utkulu, U. (1997). Exports, export composition and growth: cointegration and causality evidence for Malaysia. *Applied Economics, 29*(2), 213-223.

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.

Gonçalves, R., & Richtering, J. (1987). Intercountry comparison of export performance and output growth. *The Developing Economies, 25*(1), 3-18.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric Society*, 424-438.

Greenaway, D., Morgan, W., & Wright, P. (2002). Trade liberalisation and growth in developing countries. *Journal of development Economics, 67*(1), 229-244.

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

Hameed, D., Iqbal, A., & Devi, K. (2012). Relationship between exports and economic growth of Pakistan. *European Journal of Social Sciences*, *32*(3), 453-460.

Harrison, A. (1996). Openness and growth: A time-series, cross-country analysis for developing countries. *Journal of development Economics, 48*(2), 419-447.

Haveman, J. D., Lei, V., & Netz, J. S. (2001). International integration and growth: A survey and empirical investigation. *Review of Development Economics, 5*(2), 289-311.

Hussain, M. A. (2014). Economic growth, exports and imports in Pakistan: Granger causality analysis. *The journal of business in developing nations*, *13*(2014), 31-62.

Iqbal, Z., & Zahid, G. M. (1998). Macroeconomic determinants of economic growth in Pakistan. *The Pakistan Development Review*, 125-148.

Isaksson, A. (2002). *The Importance of Human Capital for the Trade Growth Link: Anders Isaksson*: Statistics and Information Networks Branch of UNIDO.

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.

Johnston, B. F., & Mellor, J. W. (1961). The role of agriculture in economic development. *The American Economic Review*, *51*(4), 566-593.

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.

Kemal, A., & Ahmed, I. (1992). Report of the Sub-Committee on Sources of Growth in Pakistan, Islamabad. *Pakistan Institute of Development Economics, Islamabad, Pakistan*.

Kemal, A., Din, M.-u., Qadir, U., Fernando, L., & Colombage, S. (2002). Exports and economic growth in South Asia. *A Study Prepared for the South Asia Network of Economic Research Institutions*.
Keong, C. C., Yusop, Z., & Liew, V. K.-S. (2003). Export-led Growth Hypothesis in Malaysia: An Application of Two-Stage Least Square Technique. *International finance, 3*.
Khan, A. H. (1998). The Experience of Trade Liberalisation in Pakistan [with Comments]. *The Pakistan Development Review*, 661-685.
Khan, A. H., Malik, A., & Hasan, L. (1995). Exports, Growth and Causality: An Application of Co-integration and Error-correction Modelling. *The Pakistan Development Review, 34*(4), 1001-1012.
Kohli, I., & Singh, N. (1989). Exports and growth: critical minimum effort and diminishing returns. *Journal of development Economics, 30*(2), 391-400.
Kormendi, R. C., & Meguire, P. G. (1985). Macroeconomic determinants of growth: cross-country evidence. *Journal of monetary economics, 16*(2), 141-163.
Kravis, I. B. (1970). Trade as a handmaiden of growth: Similarities between the nineteenth and twentieth centuries. *The economic journal, 80*(320), 850-872.
Krugman, P. (1980). Scale economies, product differentiation, and the pattern of trade. *The American Economic Review, 70*(5), 950-959.
Krugman, P. R. (1979). Increasing returns, monopolistic competition, and international trade. *Journal of international Economics, 9*(4), 469-479.
Lee, J.-W. (2005). Human capital and productivity for Korea's sustained economic growth. *Journal of Asian Economics, 16*(4), 663-687.
Lucas, R. E. (1988). On the mechanics of economic development. *Journal of monetary economics, 22*(1), 3-42.
Lütkepohl, H. (1982). Non-causality due to omitted variables. *Journal of Econometrics, 19*(2), 367-378.
Mahmood, K., & Munir, S. (2018). Agricultural exports and economic growth in Pakistan: an econometric reassessment. *Quality & Quantity*, *52*(4), 1561-1574.
Makki, S. S., & Somwaru, A. (2004). Impact of foreign direct investment and trade on economic growth: Evidence from developing countries. *American Journal of Agricultural Economics, 86*(3), 795-801.
Malthus, T. (1798). *An essay on the principle of population*. London, printed for J. Johnson.
Mamoon, D., & Murshed, S. M. (2005). Are Institutions More Important than Integration. *Institute of Social Studies, The Netherlands Working Paper*(416).
Michaely, M. (1977). Exports and growth: an empirical investigation. *Journal of development Economics, 4*(1), 49-53.
Miller, S. M., & Upadhyay, M. P. (2000). The effects of openness, trade orientation, and human capital on total factor productivity. *Journal of development Economics, 63*(2), 399-423.
Moschos, D. (1989). Export expansion, growth and the level of economic development: an empirical analysis. *Journal of development Economics, 30*(1), 93-102.
Njikam, O., Binam, J. N., & Tachi, S. (2006). Understanding total factor productivity growth in Sub-Saharan Africa countries. *Les Cahiers du SISERA*.
Pakistan, G. o. (2011). *Pakistan Economic Survey, 2010-11*. Islamabad: Economic Adviser's Wing, Finance Division.
Panas, E., & Vamvoukas, G. (2002). Further evidence on the export-led growth hypothesis. *Applied Economics Letters, 9*(11), 731-735.

Pesaran, M. H., & Pesaran, B. (1997). *Working with Microfit 4.0: interactive econometric analysis;[Windows version]*: Oxford University Press.
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.
Policy, S. Development Centre 2006,'SPDC Annual Review 2005-2006: Social Development in Pakistan, Trade Liberalization, Growth and Poverty'. *Social Policy and Development Centre, Karachi*.
Quddus, M. A., Saeed, I., & Asghar, Z. (2005). An Analysis of Exports and Growth in Pakistan [with Comments]. *The Pakistan Development Review*, 921-937.
Ram, R. (1985). Exports and economic growth: Some additional evidence. *Economic development and cultural change, 33*(2), 415-425.
Riezman, R. G., Whiteman, C. H., & Summers, P. M. (1996). The engine of growth or its handmaiden? In *Long-Run Economic Growth* (pp. 77-110): Springer.
Rodriguez, F., & Rodrik, D. (2001). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. In *NBER Macroeconomics Annual 2000, Volume 15* (pp. 261-338): MIT Press.
Romer, P. M. (1986). Increasing returns and long-run growth. *The journal of political economy*, 1002-1037.
Romer, P. M. (1994). The origins of endogenous growth. *The journal of economic perspectives, 8*(1), 3-22.
Sachs, J. D., & Warner, A. M. (1995). *Economic convergence and economic policies*. Retrieved from
Sengupta, J. K., & Espana, J. R. (1994). Exports and economic growth in Asian NICs: an econometric analysis for Korea. *Applied Economics, 26*(1), 41-51.
Sanjuán-López, A. I., & Dawson, P. J. (2010). Agricultural exports and economic growth in developing countries: A panel cointegration approach. *Journal of Agricultural Economics*, *61*(3), 565-583.

Shah, S. A. Y., Ahmad, N., Aslam, W., & Subhani, B. H. (2020). An analysis of the relationships among exports, imports, physical capital and economic growth in Pakistan. *Journal of Quantitative Methods*, *4*(1), 1-1.

Shahbaz, M., Azim, P., & Ahmad, K. (2011). Exports-led growth hypothesis in Pakistan: Further evidence. *Asian Economic and Financial Review*, 1(3), 182.

Shan, J., & Sun, F. (1998). On the export-led growth hypothesis: the econometric evidence from China. *Applied Economics, 30*(8), 1055-1065.
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. *The Lahore Journal of Economics* , 13(2), 59-80.
Smith, A. (1937). The wealth of nations [1776].
Söderbom, M., & Teal, F. (2003). CSAE WPS/2003-06.
Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 65-94.
Srinivasan, T., & Bhagwati, J. N. (1980). Trade and welfare in a steady state. *Flexible exchange rates and the balance of payments*, 341-353.

Srinivasan, T. N. (2001). *Trade, development, and growth* (Vol. 582): Princeton Univ International Economics.
Stokey, N. L. (1991). The volume and composition of trade between rich and poor countries. *The Review of Economic Studies, 58*(1), 63-80.
Subasat, T. (2002). Does export promotion increase economic growth? Some cross-section evidence. *Development Policy Review, 20*, 333-349.
Swan, T. W. (1956). Economic growth and capital accumulation. *Economic record, 32*(2), 334-361.
Tahir, M., Khan, H., Israr, M., & Qahar, A. (2015). An analysis of export led growth hypothesis: Cointegration and causality evidence from Sri Lanka. *Advances in Economics and Business*, *3*(2), 62-69.
Tang, T. C. (2006). New evidence on export expansion, economic growth and causality in China. *Applied Economics Letters, 13*(12), 801-803.
Tanna, S., & Topaiboul, K. (2005). *Human capital, trade, FDI and economic growth in Thailand: what causes what?* Paper presented at the DEGIT Conference Papers with.
Tariq, A., & Najeeb, Q. (1995). Export earnings instability in Pakistan. *The Pakistan Development Review, 34*(4), 1181-1189.
Thirlwall, A. P. (2000). *Trade, trade liberalisation and economic growth: theory and evidence*: African Development Bank.
Thornton, J. (1997). Exports and economic growth: evidence from 19th century Europe. *Economics Letters, 55*(2), 235-240.
Tuan, C., & Ng, L. F.-Y. (1998). Export trade, trade derivatives, and economic growth of Hong Kong: a new scenario. *Journal of International Trade & Economic Development, 7*(1), 111-137.
Tumbarello, P. (2007). Are regional trade agreements in Asia stumbling or building blocks? Some implications for the Mekong-3 countries. *IMF Working Papers*, 1-27.
Tyler, W. G. (1981). Growth and export expansion in developing countries: Some empirical evidence. *Journal of development Economics, 9*(1), 121-130.
Uk Polo, V. (1994). Export composition and growth of selected low-income African countries: Evidence from time-series data. *Applied Economics, 26*(5), 445-449.
Veganzones, M.-A., & Winograd, C. (1997). Argentina in the 20th century: an account of long-awaited growth.
Weaver, J. H. (1993). Exports and economic growth in a simultaneous equations model. *The Journal of Developing Areas, 27*(3), 289-306.
Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. *Journal of development Economics, 72*(1), 57-89.
Young, A. (1991). *Learning by doing and the dynamic effects of international trade*. Retrieved from NBER https://ideas.repec.org/p/nbr/nberwo/3577.html
Zaidi, A. S. (1999). Issues in Pakistan's Economy. In: Oxford University Press.