National College of Business Administration and Economics Lahore

DETERMINANTS OF EXPORT DIVERSIFICATION: AN EMPIRICAL EVIDENCE FROM PAKISTAN

BY

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MASTER OF PHILOSOPHY
IN
ECONOMICS

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A dissertation submitted to
School of Business Administration

In Partial Fulfillment of the
Requirements for the Degree of

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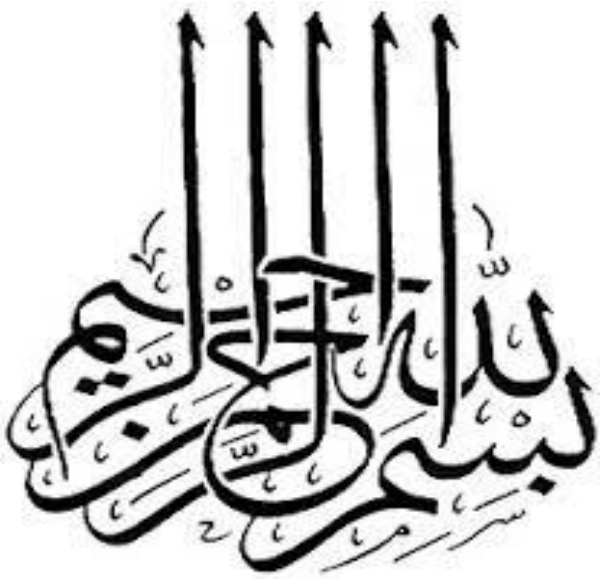

In the name of ALLAH,

The Compassionate,

The Merciful

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Dissertation Committee:

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Rector
National College of Business Administration and Economics

DECLARATION

It is to declare that this research work has not been submitted for obtaining similar degree from any other university/college.

NAIMA MUBEEN
6th August, 2015

DEDICATED
TO

My Parents

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Innumerable thanks and praises are due to Allah Almighty who blessed me with enough ability and competency to complete this dissertation. I feel deepest and heartiest gratitude for different personalities who remained very cooperative and helpful during the writing of this thesis. First of all, I want to pay affectionate thanks to my parents for their countless prayers and encouragement. I owe a debt of gratitude to my kind Dean of School of Social Science, National College of Business Administration and Economics (NCBA&E) Prof. Dr. A.R. Chaudhary for her sympathetic and precious guidance during my work. My supervisor Sir Dr. Nawaz Ahmad because of his guidance and correction in my studies I am able to complete and conduct this research work. Special thanks to my supportive family for their prayers and encouragement, they provided me opportunities for this achievement and studies. Special thanks to my dear younger brother Ahmad Bilal he helped me out during all my studies and encouraged me to achieve this goal.

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RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis entitled **"Determinants of Export Diversification: An Empirical Evidence from Pakistan"** has been carried out and completed by **Naima Mubeen** under my supervision during her **M.Phil. Economics** Programme.

(Dr. Nawaz Ahmad)
Supervisor

SUMMARY

This study calculates the export diversification using GINI Hirsch Man index and also empirically finds out the determinants of export diversification in Pakistan. This study applies unit root (ADF) test to check the stationarity of all variables used in study. ADF unit root test has been checked through Schwarz Information Criterion. This study found mix order of integration in the variables. To check long run relationship among the variables of study such as export diversification, geographic concentration of exports, real effective exchange rate, World gross domestic product per capita, foreign direct investment and trade openness, study used ARDL bonds testing approach to cointegration. Empirical analysis confirms the existence of long run relationship among export diversification, geographic concentration of exports, real effective exchange rate, World gross domestic product per capita, foreign direct investment and trade openness in Pakistan. Moreover, short run relationship has been confirmed by using ECM approach. According ECM geographic concentration of exports and real effective exchange rate have statistically significant effect on export diversification in short run while the impact of world gross domestic product per capita, foreign direct investment and trade openness seems to be statistically insignificant in short run. In accordance with long run results less geographic concentration is helpful in improving export diversification and more geographic concentration may result in lower degree of export diversification in Pakistan. Depreciation of domestic currency may lead to enhancement in degree of export diversification. Increase in world gross domestic product per capita may lead to enhancement in the degree of export diversification. In Pakistan trade openness, which is measured through ratio of trade volume to gross domestic product, and foreign direct investment has no significant role in determining the degree of export diversification. According to empirical results of this study less geographic concentration, world gross domestic product per capita and currency depreciation are helpful in case of diversifying export in Pakistan. The estimates reveal that foreign direct investment positively influence the degree of trade diversification. It implies that Pakistani policy makers should encourage and facilitate the foreign investors to invest in export oriented sectors in Pakistan.

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CHAPTER 1

INTRODUCTION

The role of international trade is important in the development of any country. Trade among nations is indispensable to fulfill the growing demand of goods and services in present age. Classical theory of absolute advantage and Ricardian theory of comparative advantage not only improve trade globally and but also beneficial for all nations. The empirical evidence depicts that distribution of trade has been uneven among different nations. Every nation wants to expand its gain at the cost of other nation. At different time, under different circumstances economists suggested various trade policies to achieve economic gains, to increase volume of trade and to correct balance of payment problems.

Notion of specialization by Adam Smith initiated the discussion on export led growth versus import substitution policies by Frankel and Romer (1999). Later, theories on comparative advantage also stressed on specialization, which also means concentration in a few products for exports.

According to Kavoussi (1985) trade economists can be divided into two groups. These groups were termed as 'Trade Pessimists' and 'Trade Optimists'. The first group followed outward looking trade policies, free trade and export promotion. The second group followed protection and import substitution policies. In the present era trade optimistic ideas are dominating. Therefore, the role of international organizations towards trade liberalization has a great significance.

At early stages countries used to specialize and exploit their resources endowment for the production and export. But at present several arguments favor export diversification (De-Specialization) that creates variety of products (Hesse, 2009). Export diversification is particularly important for low income countries as literature evidentially proved that developing countries focused on specialization or poor diversification because of economic structure and dependency on their natural resources (Cadot et al., 2011a); Minondo, 2011; Parteka & Tamberi, 2013b). Diversification of exports enables countries to produce goods from diversified nature of imported goods or inputs by Dixit and Stiglitz (1977). Traditional trade theories such as H-O model and Recardian frame work believe in productivity gains from specialization. In contrast present theories suggest the production of differentiated goods to be produced (i.e. produced by

countries of origin and countries with efficient resources in the production of that good).

Export diversification and trade liberalization have been focus of trade economists since last three decades. To spread the country's export to many other regions and countries is stated as export diversification. Export diversification is generally considered as a composition of exporting country, and combination of current export product of the country. For developing countries, export diversification may be considered as the transition from the export of traditional primary goods to non-traditional value-added products or from traditional narrow market of specific countries to broader market of large number of countries. Export diversification is a result of technology based economic growth. Diversification of exports improves total factor productivity, terms of trade and scale economies due to positive externalities.

Present evidence suggested that many developed countries in the world are focusing on higher degree of diversification of exports. Though it is not certain to say that causal relationship exists between per capita income and export diversification, however this may be debated that developed degree of diversification certainly boost up the growth of the economy. (Imbs and Wacziarg, 2003).

Study of export diversification based on resource endowment may have macroeconomic policy relevance exclusively related to sustainable economic growth. Usually countries specialize in production when they achieve a certain level of economic development but they keep on producing diversifying products along with their economic progress. Reliance on exports of a few products may cause fluctuation in economic growth and productivity through vulnerable terms of trade. Export diversification may also reduce the growth risks of external economic shocks for small open economies. While export concentration may cause economic instability in small open economies due to changes in external demand, prices and exchange rate (Parteka and Tamberi, 2013a).

Another policy debate is whether openness is more beneficial for developing or developed nations, because trade increases economic growth, development and so the welfare of the people depending on trade reforms, complementary policies, structure of economy and supporting trade policy.

In today's liberalized world, small open economies are vulnerable to external shocks. External shocks may cause economic instability which leads to poor economic performance, unemployment, low level of investment debt repayment, capital out flows and inflation due to low foreign exchange

earnings. So, each economy strives for improving the standard of living of their citizens and achieves higher standards of living through global competitiveness and more sustainable gains from trade. Diversified exports may be helpful in minimizing economic instability caused by external shocks due to contraction in demand of some specific trading partners and price fluctuations in export market. Production and export structure of an economy determine the sustainability and competitiveness of an economy. International trade based on product and market diversification leads to enhanced global competitiveness and absorption capacity of external shocks.

Empirical research and new trade theories of monopolistic competition by (Krugman (1980), 1981)) and Helpman and Krugman (1989) focused on expansion and availability of product variety. This study also aims at focusing endogenous growth theories by Aghion and Howitt (1999) to expand variety of products.

Empirically product diversification can be judged by two ways.

1. Degree of economic activity concentration
2. Relative specialization of products by individual countries with respect to world benchmark.

In case of uncertainty and declining price level of primary goods in developing countries induce producers to increase export diversification, because diversification of exports reduces the instability of export earnings. If a country's export composition has assortment then the loss in the exports of one subset of goods can largely be offset from another subset of export group.

Yet, it is to decide about main drivers of export diversification, because of dearth of literature regarding export diversification drivers. We can find a very few studies exploring the determinants that bring change in export diversification across the world. Many developing countries made structural reforms during last two or three decades to improve their economic performance in general and focused on export diversification in particular. Literature also support that export diversification may affect productivity and so economic growth. Melitz (2003) found that increase in productivity by means of export diversification provided exporters should be more efficient than non-exporters. This idea was practically and theoretically justified by Feenstra (2010).

The present study also aims to contribute in finding the determinants of export diversification in case of Pakistan. This study will also explore those

hypotheses which are discussed in earlier studies as policy debate but have not been empirically tested in case of Pakistan.

1.1 EVOLUTION OF EXPORT DIVERSIFICATION IN PAKISTAN

Pakistan kept on changing trade policies in the context of domestic needs and global environment since independence. During 1950 Pakistan embraced import substitution policy and to make it successful exchange rate was overvalued to buy imported machinery equipment for domestic industry. In the late 1950s trade policies were formulated for producers to buy low price agricultural raw material than the world price, therefore this period is deemed as the extreme protection period by Khan and Ali (1998). After 1950s export bonus scheme was introduced by government of Pakistan to increase the export, subsequently Pakistan's export grew at the rate of 11.4% on annual average during 1960s.

Export diversifications, structure of exports and structural changes in Pakistan's export from empirical findings have shown mix results. Export diversification in Pakistan started increasing sharply from 1979 and continued its momentum till 1985 but after 1985 a significant reduction in export diversification was observed consequently Pakistan again reached to the stage of 1979. The reason is a strong association of producers with the production of primary goods (produced traditionally) instead of producing a variety of manufactured goods (produced nontraditionally). From the period of import substitution strategy, to the period of structural changes and trade liberalization the real comparative advantage of Pakistan was empirically observed. Consequently production of primary goods went up and manufactured goods exports declined (Akbar et al., 2000).

In the last two decades growth in export earnings have been terrific. Growth in export earnings of Pakistan increased from US$6.3 billion to US$ 18.3 billion (State Bank of Pakistan, 2010). This is due to the volatile export performance of different sectors of Pakistan relative to the world exports. Facts related to the sectoral export performance of Pakistan had not been impressive as its share in the world exports started to decline since 1990s. During 1990s Pakistan's export share in the world export was 0.18%, in 2008 it was 0.15%, and in 2013 this export share was 0.139603. On the basis of export growth history of Pakistan we cannot take any hard line regarding export projection. History depicted yearly variation in the export pattern of Pakistan (Ahmad et al., 2010).

Table 1.1
Structure of Exports in Pakistan ($ Million)

Particular	July-April		% Change	Absolute Change
	2012-13	2013-14 P		
Total	20143.2	20997.5	4.2	854.3
Food Group	3918.0	3945.7	0.7	27.7
Rice	1589.6	1850.4	16.4	260.9
Sugar	393.1	248.3	-36.8	-144.8
Fish & Fish Preparation	255.8	292.1	14.2	36.3
Fruits	340.6	399.0	17.1	58.4
Vegetables	213.6	187.0	-12.4	-26.6
Wheat	53.4	7.1	-86.8	-46.4
Spices	55.1	44.6	-19.0	-10.4
Oil Seeds, Nuts & Kernels	28.0	76.7	174.2	48.7
Meat & Meat Preparation	177.6	192.5	84.4	14.9
Other Food items	811.2	648.0	-20.1	-163.2
Textile Manufactures	10739.8	11437.6	6.5	697.8
Raw Cotton	138.3	196.1	41.8	57.8
Cotton Yarn	1860.5	1708.1	-8.2	-152.4
Cotton Cloth	2224.0	2346.8	5.5	122.8
Knitwear	1663.6	1842.1	10.7	178.5
Bedwear	1468.2	1767.3	20.4	299.1
Towels	645.0	624.5	-3.2	-20.3
Readymade Garments	1470.8	1580.8	7.5	110.0
Made-up Articles	480.8	552.1	14.8	71.3
Other Textile Manufactures	788.6	819.8	4.0	31.2
Petroleum Group	6.2	601.3	9653.7	595.1
Petroleum Products	5.7	58.6	919.4	52.8
Petroleum Top Neptha	0.0	542.7	-	542.7
Other Manufactures	4227.6	3852.3	-8.9	-375.3
Carpets, Rugs & Mats	96.8	106.5	10.0	9.7
Sports Goods	268.5	286.1	6.6	17.6
Leather Tanned	390.1	438.2	12.3	48.1
Leather Manufactures	463.2	519.4	12.1	56.2
Surgical G. & Med Inst.	252.6	281.7	11.5	29.1
Chemical & Pharma. Pro.	636.3	962.7	51.3	326.5
Engineering Goods	217.8	255.1	17.1	37.3
Jewelry	1142.9	319.1	-72.1	-823.8
Cement	468.7	415.0	-11.5	-53.7
Guar & Guar Products	119.8	58.4	-51.2	-61.4
All Other Manufactures	170.9	210.1	22.9	39.2
All Other Items	1251.6	1160.5	-7.3	-91.0

P : Provisional, Source: Government of Pakistan (2014)

Table 1.1 shows the structure of exports in Pakistan. Textile manufacturers have the largest share in total exports. Share of textile manufactures exports in 2012-2013 and in 2013-2014 is $10739.8 million and $ 11437.6 million respectively. Food group has the second largest share in total exports. Share of food group exports in 2012-2013 and 2013-2014 is $ 3918.0 million and $ 3945.7 million respectively.

Table 1.2
Pakistan's Major Exports (Percentage Share)
in Total Exports of Pakistan

Commodity	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	July-March	
							2012-13	2013-14 P
Cotton Manufactures	**51.9**	**52.6**	**50.6**	**52.9**	**49.6**	**5136**	**51.8**	**52.9**
Leather**	**5.8**	**5.4**	**4.5**	**4.4**	**4.4**	**4.7**	**4.5**	**4.9**
Rice	**9.8**	**11.2**	**11.3**	**8.7**	**8.7**	**7.8**	**7.7**	**8.7**
Sub-Total of three items	**67.5**	**69.2**	**66.4**	**66.4**	**62.7**	**64.1**	**64.0**	**66.5**
Other Items	**32.5**	**30.8**	**33.6**	**34.0**	**37.3**	**35.9**	**36.0**	**33.5**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

P : Provisional ** Leather & Leather Manufactured
Source: Government of Pakistan (2014)

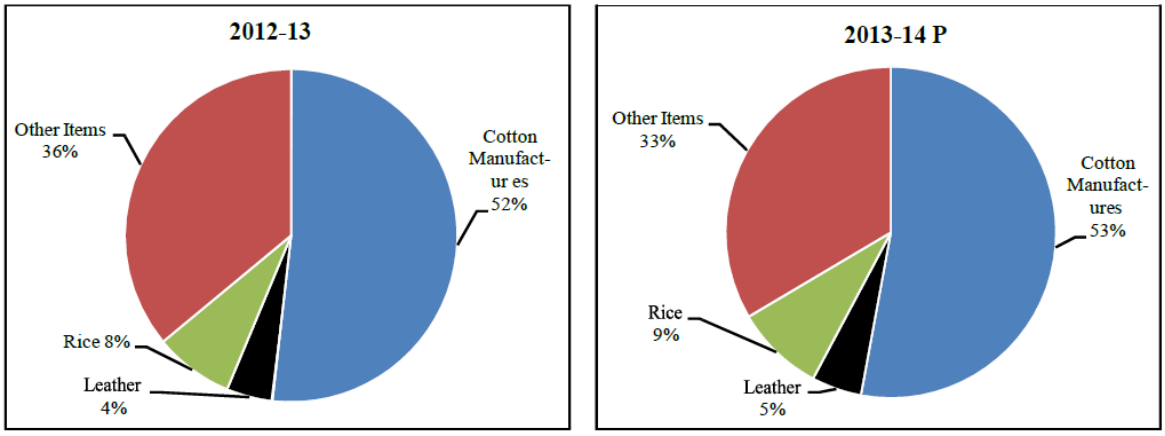

Figure 1.1: Pakistan's Major Exports (Percentage Share)

Table 1.2 explains the major exports of Pakistan. Percentage share of Cotton Manufacturers in 2012-2013 and in 2013-2014 was 51.8 and 52.9 percent in total exports respectively. Percentage share of rice in 2012-2013 and in 2013-2014 was 7.7 and 8.7 percent in total exports respectively. Percentage share of leather in 2012-2013 and in 2013-2014 was 4.5 and 4.9 percent of total export respectively.

Table 1.3
Major Exports Markets of Pakistan (Rs. Billion & Percentage Share)

Country	2008-09		2009-10		2010-11		2011-12		2012-13		July-March 2013-14P*	
	Rs.	% Share	Rs.	% Share	Rs.	% Share	Rs.	% Share	Rs.	% Share	Rs.	% Share
U.S.A.	261.4	19	281.7	17	338.3	16	315.3	15	341.3	14	291.9	15
China	54.9	4	96.7	6	139.7	7	195.9	9	252.5	11.	199.9	10
U.A.E.	114.8	8	144.2	9	154.6	7	205.6	10	205.4	9	153.7	8
Afghanistan	109.3	8	131.7	8	199.6	9	200.6	10	200.0	8	144.5	7
UK	68.5	5	86.1	5	103.1	5	105.7	5	121.2	5	120.6	6
Germany	57	4	66.5	4	108.8	5	94.0	4	93.6	4	87.8	4
France	24.6	2	26.7	2	34.1	2	29.8	1	93.7	4	56.5	3
Bangladesh	30.1	2	40.6	3	86.8	4	56.6	3	68.7	3	52.2	3
Italy	45.3	3	50.8	3	67.6	3	51.6	2	52.2	2	51.2	3
Spain	37.7	3	36.4	2	48.9	2	43.7	2	51.0	2	31.4	2
All other	544.9	40	655.9	41	839.3	51	811.9	38	887.0	37	802.0	40
Total	1383.7	100	1617.5	100	2120.8	100	2110.6	100	2366.5	100	1991.6	100

P* Provisional Source: Government of Pakistan (2014)

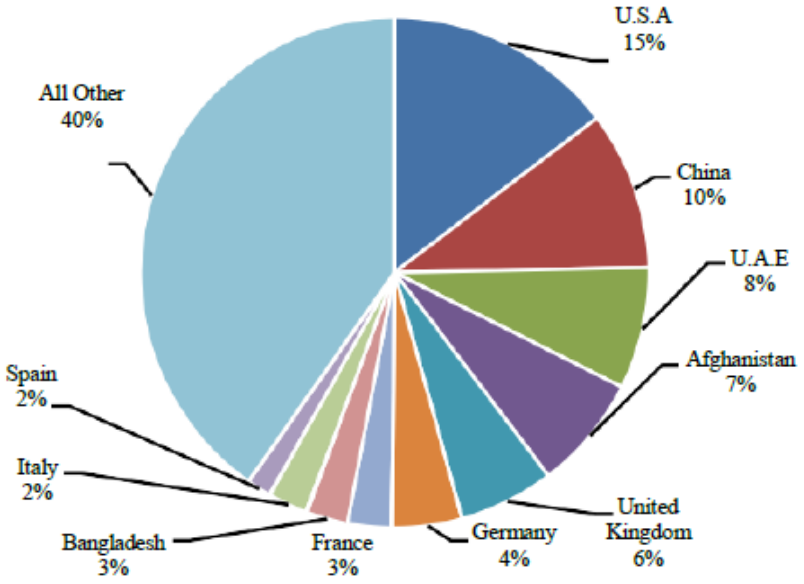

Figure 1.2: Major Exports Markets of Pakistan
(Rs. Billion & Percentage Share)

Table 1.3 shows major exports markets of Pakistan. USA, China, UAE, Afghanistan, UK, Germany, France, Bangladesh, Italy and Spain are major exports markets. Share in export of these markets in 2012-2013 and 2013-2014 was Rs. 2,366.5 billion and Rs. 1,991.6 billion of total exports respectively.

1.2 PROBLEM STATEMENT

Export diversification not only increases the trade volume but may be helpful for correcting balance of trade problems. We can find enough literature on the determinants of export performance but there are a few studies available on the determinants of export diversification in case of Pakistan. There has been a great significance of export diversification. But in Pakistan we find huge gap in terms of arbitrating export diversification whether Pakistan is moving towards concentration or diversification. Therefore present study aims at estimating degree of export diversification over time. Moreover study aims to find the determinants of export diversification in case of Pakistan.

1.3 OBJECTIVES

1. To calculate export diversification using index (Gini Hirschman).

2. To find the determinants of export diversification of Pakistan

1.4 HYPOTHESES

1. **H_0:** Geographic concentration does not affect export diversification.

2. **H_0:** Foreign direct investment does not affect export diversification.

3. **H_0:** Real exchange rate does not affect export diversification.

4. **H_0:** World real per capita income does not affect export diversification.

5. **H_0:** Trade openness does not affect export diversification

1.5 ORGANIZATION OF THE STUDY

Following is the organization of the current study. Chapter one consists of introduction. The literature review on export diversification and its determinants is documented in chapter two. Theoretical evolution of export diversification and methods for econometric analysis are presented in third chapter. Chapter four includes the interpretation of empirical estimates. Conclusion, suggestions and policy implications are discussed in chapter five.

CHAPTER 2

LITERATURE REVIEW

In case of Pakistan, study found lack of literature on export diversification and its determinants. However a few studies either considered the export diversification in the context of trade liberalization policy or as one of the indicators of export performance. We can find some global studies on the issues of determinants of export diversification. In this section study will explore literature on this issue, whether investigated in Pakistan or in any other country.

Derosa (1992) theoretically explained the increase in diversification of export in commodity exporting countries. Model of comparative advantage by Heckscher Ohlin Samuelson (HOS), was used for explanation of export diversification. It was found that term of trade in low income countries was very low for exchange of services of human and physical capital with natural resources. Findings of theoretical analysis were shown that export diversification was considered as strategy for stabilizing and increasing the export earnings of commodity exporting countries. For domestic and international financial markets, more liberal economic policies were considered as driver of greater benefit, and encouraged these low income nations with the economy of the world in the market for risk as well as traded goods.

On the basis of previous studies, Delios and Beamish (1999) examined product diversification and the geographic scope by using corporate performance of 399 Japanese manufacturing firms. Partial least square method was used to study the empirical analysis. Results were revealed that expansion in new geographic markets promoted the performance of Japanese firm and was considered as effective strategy.

In case of Pakistan the role of internal and external factors that determined export performance were less comparatively taken into consideration. At the macro levelAkbar et al. (2001) found that Pakistan's export performance was sensitive to both domestic and external market situations, especially in the area of competiveness. On the other hand the researchers found that it was more sensitive in relation to demand-side variables than other factors.

Alesón and Escuer (2002) examined the impact of product diversification strategy on corporate performance of large Spanish firms. By

using Tobin's Q technique, data from the year 1992 to 1995 of 103 large Spanish non -financial firms was used to conduct the empirical analysis. To measure the diversification categorical variable suggested by Varadarjan was used. Findings were shown that firms with very low or very high diversification showed lower performance. According to results firms diversified along with their capabilities and their resources. By following product diversification strategy of any type, firms were promoting additional income sources.

By using co-integration technique, Dutta and Ahmed (2004) studied trade liberalization and industrial growth in Pakistan. Data from the years 1973 to 1995 was used to conduct the empirical analysis. Cointegtarion and error correction modeling approach was used for empirical investigation. Empirical findings of the study has confirmed the existence of a long run relationship among overall industrial value added and its major determinants. Real capital stock, labor force, real exports, import tariff collection rate, and secondary school enrolment ratio were used as determinants of industrial value added. Error correction model shown significant results of Pakistan's growth function industrial value added in short run.

Hesse (2006) Studied the relationship between export diversification and economic growth. Panel data from the year 1962 to 2000 was used to conduct the empirical analysis. Herfindahl Index was used to calculate the export concentration. GMM estimator was used to find the relationship between export diversification and economic growth. Results were shown a positive impact of export diversification on per capita income. In accordance with empirical analysis developing countries should promote export diversification while developed countries were performing better with specialization.

Kali et al. (2007) explained relation between trade structure and economic growth. Data 1980 to 2000 was used. Herfindal Hirschman index was used to calculate the concentration. Number of trading partners and concentration were considered as trade structure. Economic growth is positively correlated with diversification in rich countries. GDP per capita, annual population, and secondary education, investment share of GDP, trade openness, government expenditure, and number of trading partners were used to check the trade structure and economic growth. According to empirical findings there was positive relation between economic growth and trade concentration, and it was concentrated in poor countries.

Wiersema and Bowen (2008) theoretically examined the impact of foreign competition, industry globalization and product diversification. Panel

data form 1987 to 1999 of U.S firms was used for empirical analysis. Theoretical frame work explained that how growing globalization of market and industries were influenced the product diversification of firms. Empirical findings were shown that by U.S firms, foreign based competition and industrial globalization were statically significant factors in order to explain the scope and degree of international diversification.

Nicet-Chenaf and Rougier (2008) studied the relationship among FDI, growth and export diversification of MENA Countries. Data for the year 1995 to 2004 was taken for empirical studies. GMM system method was used to conduct the empirical investigation. Results were shown that FDI positively and significantly affected the economic growth in MENA countries. FDI also positively accelerated growth in export diversification.

By using firm level data Din et al. (2009) examined the export performance on the basis of its determinants in case of Pakistan. Study was based on a survey. Survey based data of four major sectors of export oriented firms was taken for the empirical analysis by Pakistan Institute of Development Economics (PIDE) and United Nations Industrial Development Organization (UNIDO). 180 firms were chosen from four major exporting sectors. Data estimation was done by Ordinary Least Squares technique and white test was used to avoid the problem of Hetroskedasiticity. Empirical findings shown that level of investment in market oriented technologies was positively related to export performs at firm level. Furthermore results were shown that latest market required stronger market networks and upgrading technological improvement for production. Lack of certification of submissions to international products and lower standards of products were considered as barriers in the way to efficient export performance. Better transportation and suitable geographic conditions were considered helpful in promotion of better export performance.

At micro level, Masakure, Henson, and Cranfield (2009) examined in case of Pakistan's exporting firms the effects of quality certification on export sales and share of exports. Logit model was used and it was treated certification as a binary dependent variable. The results were shown the existence of a positive correlation between export performance and ISO 9000 certification. It was suggested that the share of export might play a key role in the establishment of exporter's credibility and may brought gains in performance.

Ahmad et al. (2010) studied Pakistan's export performance of last three decades. Study observed that Pakistan has been poor in export performance as compared with other Asian countries. Pakistan's export diversification was

market based; high level of export concentration and sophisticated level of export of country were considered responsible for the poor performance of Pakistan's export. Agriculture and medium technology exports were considered as potential drivers of growth of export in Pakistan. Moreover it was observed that huge investment is needed to increase exports from these sectors. In addition, to improve the performance of export sector this paper examined the policy environment for export competitiveness and suggested measures for providing a policy framework, specially a supportive exchange rate policy.

Cadot et al. (2011b) examined trade diversification its drivers. Panel data for 10 variables of 87 countries from year 1990 to 2004 was used. Thiel index was used to conduct the empirical analysis. Trade liberalization, infrastructure, education and governance were taken as drivers of trade diversification. In term of diversification new products was considered as extensive margin. In terms of export growth higher volume was considered as intensive margin. Results were shown that trade liberalization promote trade diversification both in extensive and intensive margins. In accordance with Thiel Index, variables that were considered as drivers of trade diversification were influenced extensive margin. Education showed positive results in relation with trade diversification. Empirical findings were shown that infrastructure also appeared as important driver of trade diversification.

Parteka and Tamberi (2011) found the determinants of export diversification. Panel data of at two levels disaggregation of 60 countries from 1985 to 2004 was used. Theil index in relative and absolute terms was used for empirical study. Along with the growth of economy, distance from markets, human capital, technological capacity, institutional frameworks, were considered as determinants of promoting diversification of trade.

Yiğit and Tür (2012) examined association between organizational performance and diversification strategy applications by using Herfindal index. Data over the period of 2005 to 2009 of 359 companies that were listed under Istanbul stock exchange was used. Results of Herfindhal Index were shown that relationship between diversification based strategy and organizational performance was different in well-established nations, but were alike in developing countries. In developing countries barriers in research and development, economic crises were considered as hurdles in the way of diversification strategy.

Agosin et al. (2012) explained the determinants of export diversification across the world. Trade openness, real exchange rate and human capital association were examined in relation with export

diversification. It was observed that trade openness induced specialization and not export diversification. Accumulation of human capital was considered as useful source to promote export diversification. Real exchange rate volatility and overvaluation did not show significant role. However overvaluation and exchange rate volatility did not show negative affect on diversification in regression results.

Falvey et al. (2012) examined the trade liberalization in relation with economic growth, during crises and non-crises period. Threshold regression technique was used to conduct the analysis on five crises indicators to find "Crises Value". During crises and non-crises regimes role of trade liberalization towards economic growth was observed. Panel data for the years 1960 to 2003 was used to conduct the analysis. Long run results of the study were shown that trade liberalization increased economic growth both in crises and non-crises period.

Ratnaike (2012) examined the empirical relationship between trade liberalization and export performance for OECD countries. Panel data from the year 1980 to 2010 was used to conduct the empirical analysis. Economic freedom of the world index (EFW Index) was used to conduct the empirical analysis. Export performance was taken as dependent variable while weighted mean tariff rates of all the products and average mean tariff rates for rest of the samples countries were taken as independent variables. These tariff rates were used as a proxy for world tariff rates. And results were shown that trade liberalization had a positive significant impact on export performance.

Cimoli et al. (2013) examined the effect of real exchange rate on diversification and technological intensity of export structure. Panel data for the year 1962 to 2008 of 111 countries was used to conduct the analysis. Higher real exchange rate allows a higher export diversification. This diversification implies an upgrading in the technological intensity of exports, was tested in the study. These results suggest that in the process of economic development, a competitive real exchange rate was considered as significant variable as it positively supported the transformation of the pattern of specialization.

Regolo (2013) examined how export diversification varies across markets. Data from the years 1995 to 2007 of 102 trading partners was used for empirical analysis. Results were shown that bilateral trade costs relatively low were considered as source of increase in export diversification.

Parteka and Tamberi (2013a) empirically explained the determinants of export diversification in the process of development. Twenty years data of sixty countries of the world was used to check the diversification trend of economies in different phases of economic development. It was observed that poor countries diversified less and specialized more in term of export structure. Not only development but geographical conditions, institutions and economic conditions of a country also determined the level of export diversification. Country size, trade conditions and location significantly determine the sectoral composition of trade structure. Small countries were moving towards specialization in manufacturing export but did not concentrate on export diversification. Furthermore, being far from major markets has deteriorated their ability to extend their market size. Thus, from the economic core of the world, countries which are sited distant are having tendency of those manufacturing exports which are less diversified in real because of trade barriers.

Haddad et al. (2013) checked the growth volatility as a result of trade openness by using export diversification. Panel data of 77 developed and developing countries over the period of 1976 to 2005 was used. GMM estimator technique was used to conduct the empirical analysis. Growth volatility was checked on the basis of openness and export concentration. Empirical findings were shown that product diversification prevented growth volatility from global shocks. Results also stressed on promotion of trade openness for increasing diversification of exports and economic growth.

Kang and Lee (2014) examined the relationship between geographic diversification and firm's performance in US lodging Industries on the basis of adjusting role of brand diversification .Data of 176 firms over the period of 1993 to 2010 was used for empirical studies. Herfindahl index was considered as appropriate method for measuring the export diversification. According to empirical results the relationship between firm's performance and geographic diversification was positive and significant. There was negative and significant relation between brand diversification and firm's performance.

Chowdhury et al. (2014) studied empirically the role of sectoral diversification in case of exchange rate regime. In order to examine sectoral diversification and exchange rate regime, two mechanisms, external shock absorption and rent seeking mechanism were explained. Panel data of 91 countries from 1985 to 2006 was used for empirical analysis. Results were shown that in countries where greater external shocks were experienced diversification was related with the flexible regime. Countries with higher level of corruption and lower level of diversification were considered for

fixed regimes, and might protect the strong economies from international competition. For direct effect of diversification in adopting flexible regimes weak evidences were seen in results.

Erkan et al. (2014) estimated product and market diversification in case of Turkey. This study was conducted from the year 1990 to 2012. Concentration Ratio of Commerce, Entropy, Gini-Hirschman, Penetration and Deviation Indices, and were used to explain the level of import and export in Turkey. Findings of this study showed that Turkey has been successful in market diversification and has been unsuccessful in product diversification. Because of significant increase in export diversification, Turkey was successful to decrease its dependence on certain markets.

Mau (2014) examined the export diversification and income differences at different economic stages of development. In this study technology differences are peroxide by income differences, that could be understood with neoclassical growth theory and its application to standard trade models. In explaining diversification at the extensive margin the role of technology differences conforms cross-country applications of the neo-classical growth model.

Chaney (2014) explained the network structure of international trade. Data for the period 1986 to 1992 was used to conduct the empirical analysis. In order to find a stable distribution of exports across firms dynamic model approach was used. By using this model the dynamics of entry of individual firms into foreign markets, the cross-sectional distribution of the geographic distance from foreign contacts, and well defined forecasts about cross-sectional distribution of the number of foreign contacts, were found. In accordance with the results it was observed that firms export only into the market they had already a contact and search new trading partners using existing market contacts. Results were revealed geographic crisis slightly effected those firms that export to large number of countries.

From International Trade Centre (2014) for the calculation of export performance in different dimensions of the multi-faced firms by sector and by country, The Trade Performance Index (TPI) was introduced. Raw data of 14 different export sectors of 180 different countries form United Nations Commodity Trade database (COMTRADE) and ITC Trade Map was used to calculate index. By using raw data indicators were defined of more than 5000 products at 6-digit level. TPI calculated the export performance of each sectors in comparison with the other countries and also checked the level of competitiveness. TPI also explains the causes of gains and losses in the world market shares it also help to find those factors that caused changes. Using

different indices of diversification, concentration and calculation of market share and world share, countries were ranked in accordance with their trade performance and competitiveness. In results due to change in world demand trade map showed random and inconsistent trend of different countries. And export performance was affected by changes in world demand in different order.

Noureen and Mahmood (2014) empirically studied the trends and factors affecting export diversification in ASEAN and SAARC regions. Panel data for the year 1986 to 2012 of ASEAN and SAARC countries was used for empirical studies. Fully modified ordinary least square model of co-integration was used to conduct the empirical investigation. In ASEAN and SAARC regions according to empirical estimations were shown that domestic investment, foreign direct investment, financial sector development and institutions strength significantly and positively affected the export diversification.

CHAPTER 3

THEORETICAL FRAMEWORK, ECONOMETRIC METHODOLOGY AND DATA SOURCES

3.1 THEORETICAL FRAMEWORK

Study of export diversification, its trends or determinants requires a careful and suitable measurement of the concept. There are several measures and indices to quantify the concept of export diversification. Most of these indices and measures are developed to assess the degree of concentration and export diversification is considered as reciprocal of export concentration.

There are so many indices that are used to measure the concentration or diversification. Some of these indices are used as relative measures and the other indices are used as absolute measures. These indices are different from one another because of their properties, strengths and weakness. These indices are used for specialization in relative and absolute terms and also used in order to check the presence of heterogeneity resulting from measurement of these indices.

For absolute measure of specialization Shannon Entropy Index, Herfindahl Hirschman Index, Diversification Index and Absolute Gini Hirchman Index are used. For measurement of relative specialization Relative Gini Index and Theil Index indices are often used. Krugman Specialization Index and Index of Inequality in Productive Structure are heterogeneity indices. Moreover Penetration Index, Concentration Index, Deviation index and Trade Concentration Ratio are also used as common measure of concentration. A brief overview of some well-known indices is given in the upcoming paragraphs.

3.2 ABSOLUTE INDICES FOR MEASUREMENT OF SPECIALIZATION INDICES

3.2.1 Absolute Gini-Hirchman Index

Most common and widely used measure of concentration or diversification of exports is Gini-Hirchman Index. In order to measure the comparison between periods Gini-Hirchman Index is widely used. In distribution of country's export this index indicate the level of country (or

product). Index value ranges from 0 to 100. If index value is close to 100 its mean there is high concentration or less diversification. And if index value is close to 0 its mean there is less concentration and high diversification (Erkan, 2014).

$$GHI = 100\mathrm{X}\left[\sum_{k=1}^{n}\sqrt{\left(X_{kt}/X_{t}\right)^{2}}\right] \quad (3.1)$$

Here in formula

GHI shows the value of index.

X_{kt} Value of a country's export of certain commodity in period in period t.

X_{t} Value of Total exports of a country in period t.

To calculate GHI first calculate the ratio of export of country i to total exports. Take the square of this ratio. Take the sum of different squared ratios. Calculate the square root for sum of squared ratios and multiply it by 100 for getting the percentage value of GHI.

GHI is also used to calculate the import diversification or concentration. Here country i uses imports instead of share of export of country i to total share of all countries imports instead of total export.

$$GHI = 100\mathrm{X}\left[\sum_{k=1}^{n}\sqrt{\left(M_{kt}/M_{t}\right)^{2}}\right] \quad (3.2)$$

GHI shows the value of index.

M_{kt} Value of a country's imports certain commodity in period t.

M_{t} Value of total imports of the country in period t.

3.2.2 Hirschman-Herfindahl Index (HHI)

In industrial economics Hirschman-Herfindahl Index (HHI) is widely used not only to check the market concentration but also used to check the

presence of cartels and Oligopoly. HHI is also used for the analysis of macroeconomic specialization and economic diversity. The formula for calculating HHI is given below:

$$\text{HHI}_{KH} = \sqrt{\sum_{i=1}^{I} b_i^2} \tag{3.3}$$

where b_i represents the share of ith commodity in total exports.

3.2.3 Ogive Index

This index is linear transformation of Herfindahl Hirschman Index (HHI) and is used to check the economic diversity and country's specialization.

$$O = I * HHI - 1. \tag{3.4}$$

3.2.4 Shannon Entropy Index

In order to calculate the state of spread in trading partner of a country Entropy Index is used. Increase in index value indicates that rate of spread increases and vice versa. The formula for calculating this index is given as:

$$E_m = \sum_{i=1}^{m} P_i \times \ln\left(1/P_i\right) \tag{3.5}$$

where in formula P_i shows the share of trade from partner country for country i. High index value indicate high concentration (lower diversification) and vice versa (Erkan, 2014).

3.2.5 Diversification Index

This index is also used to check the specialization. This index is used to construct the Crude Diversification Index (CDI) and Refined Diversification Index (RDI) to measure the specialization (Erkan, 2014).

Formula for calculating Crude Diversification Index is as below:

$$CDI = b_1 + \sum_{j=2}^{n}\left(b_j + \sum_{k=1}^{j-i} b_k \right), \text{ where } lCDI = I \tag{3.6}$$

and formula for measuring Refined Diversification Index is given as:

$$RDI = \frac{CDI - aCDI}{lCDI - aCDI}, \text{where } CDI > aCDI > lCDI \tag{3.7}$$

3.3 RELATIVE INDICES FOR MEASUREMENT OF SPECIALIZATION

3.3.1 Relative Gini-Hirchman Index

In many fields of economics the most commonly used index is Gini-Hirschman Index. In past studies (Relative GHI) is used to check the industrial localization. But in present study this index is used to calculate the specialization, concentration or diversification. The drawback of this index is that it does not treat all deviations equally, of certain country in relation with reference in case of economic structure. Relative GHI is only index that can be decomposable. When there are merging industries in calculations we get misleading results. This index is related with Lorenz curve. The level of specialization decreases when area between Lorenz curve and 45^0 is smaller (Palan, 2010).

3.3.2 Theil Index

Theil Index (T) is modified form of Entropy Index. Greatest advantage of this index is only relative index that can be decomposed. This index is widely used in economics in order to calculate the specialization, concentration and diversification. But this index has drawback that it can give misleading calculation and distorted results because of division of industries into sub-industries. Theil Index due to its drawbacks is not such reliable as compare to other indices of concentration. But it is widely used in economics because of its decomposable property (Palan, 2010).

Formula for calculating Theil Index is given below:

$$T = \frac{1}{I}\sum_{i=1}^{I} \frac{b_i}{\overline{b_i}} \ln \frac{b_i}{\overline{b_i}}. \tag{3.8}$$

3.4 HETEROGENEITY INDICES

3.4.1 Krugman Specialization Index

One of the standard measures of specialization indices is Krugman Specialization Index (K). K Index is used to calculate the state of specialization of one country in relation with the reference countries. Mainly it is the standard error of industry shares. This index is basically used to calculate the share of employment of industry that can be rearranged in order to achieve that industry structure share which is equivalent to the average structure of the reference group. Here employment is used in term of industrial share of certain country in specialization. The reference value in index either can be the one country or it also represents the mean value of all the countries (Palan, 2010). The following formula is used to calculate this index:

$$K = \sum_{i=1}^{I} \left| b_i - \overline{b_i} \right| \tag{3.9}$$

If K value is close to zero its mean the economic structure of the single country look like the economic structure of reference countries. High value of index indicates that economic structure of one country much differ from the reference country and need to be more specialized. In other words when country is more specialized as compared with reference country the value of K Index will low and vice versa.

3.4.2 Index of Inequality in Productive Structure

Basically in Productive Structure the Index of inequality (IP) is modified form of Krugman Specialization Index (K). This is simply the variance of employment shares. IP Index is used to calculate the large deviation of specialization of one country in relation with reference countries. This index is also used to calculate the rate of specialization at different economic structure of one country, in relation with reference countries (Palan, 2010). The formula for calculating IP is given as:

$$IP = \sum_{i=1}^{I} \left(b_i - \overline{b_i} \right)^2 . \tag{3.10}$$

3.5 OTHER CONCENTRATION INDICES

3.5.1 Penetration Index

In order to check the import demand of partner countries and their role in development, Penetration Index is used. It value for the base (base year) is 100. If value of the index is higher than 100 it means there is great import demand for certain country and vice versa (Erkan, 2014). The formula of the index is as below:

$$PI_{mk} = \frac{M^{j}}{M^{w-j}_{mk}} \times 100 . \qquad (3.11)$$

3.5.2 Deviation Index

Deviation index is used to calculate the export value of certain product of a country in favor of other country. Its value is calculated on the basis of base year which assumes the index value of 100. The formula for calculating this index is given below:

$$DI = \frac{X^{m}_{jk}}{X^{w-m}_{jk}} \times 100 \qquad (3.12)$$

where, the numerator represents the figure of export of merchandise k to country m of country j and the denominator represents the value of export of merchandise k to out of country m to country j.

If value of the index is more than 100 in other year its mean the export merchandise k of country j tend to develop in country m and vice versa (Erkan, 2014).

3.5.3 Trade Concentration Rate

Because of very simple calculations Trade Concentration Rate (CR_m) is widely used for measurement of concentration. CR_m represents total share of country or industry, products, and certain number of firms. Its value ranges from 0 to 100. The formula for calculating CR_m is given as follows:

$$CR_m = \sum_{i=1}^{m} P_i \times 100 \quad (3.13)$$

In formula CR_m shows the trade concentration value and P_i shows the share of certain firm, industry, country, or product (Erkan, 2014).

There are so many indices that are used in order to calculate the level of concentration, diversification and specialization in previous studies, are briefly mentioned above. But in accordance with this study and according to the requirement of available data of this study, Gini Hirchman Index is considered as most suitable and appropriate measure for empirical analysis.

The present study is aimed at calculating export diversification of Pakistan on the basis of sectoral data. It is also aimed at finding the determinants of export diversification in case of Pakistan. One of the objectives of this study is to calculate Gini-Hirschman Index. So, in order to fulfill the objectives of this study Gini-Hirschman Index is used for calculating the degree of export diversification for Pakistan by using sectoral data. This index is also used to calculate the market concentration that is taken as geographic concentration in this study. In present study Gini-Hirschman Index is used because UNCTAD considered it as a standard index. UNCTAD already calculated export diversification index for the period from 1995 to 2010 by taking 261 (SITC 3 digit level commodities) whose share in total export of the respective country is more than three percent. Present study calculates export diversification index for the period from 1980 to 2012 using Gini Hirschman Index.

3.6 ECONOMETRIC METHODOLOGY

After calculating GHI as measure of export diversification, this study also finds out the determinants of export diversification. Keeping in view the economic literature on international trade and export diversification, foreign direct investment, world gross domestic product per capita, real effective exchange rate, trade openness and geographic concentration of exports are chosen as possible determinants of export diversification in the current study.

To find the link between export diversification and its selected determinants, the following model is specified for empirical analysis:

$$EDIV_t = F\left(GCI_t, FDI_t, REER_t, TO_t, WGDPC_t\right), \; t = 1980,1981,...2012. \quad (3.14)$$

This functional form of the models is then converted to the regression models as:

$$EDIV_t = \beta_1 + \beta_2 GCI_t + \beta_3 FDI_t + \beta_4 REER_t + \beta_5 TO_t + \beta_6 WGDPC_t + \mu_t, \quad t = 1980,1981,.....2012. \qquad (3.15)$$

where

EDIV = Export diversification
GCI = Geographic concentration of exports
FDI = Foreign direct investment as a percentage of gross domestic product (GDP)
REER = Real effective exchange rate
TO = Trade openness taken as total trade to GDP
WGDPC = World GDP per capita
't' is a time subscript represents.

Export diversification is estimated through Gini Hirschman Index. Export diversification is taken on the basis of sectoral data. Geographic concentration is estimated by taking highest importing countries from Pakistan i.e. average of top ten countries where Pakistan export its products taking on the basis of export value in terms of US $ dollars. Real effective exchange rate is taken in dollar value of rupee. Trade openness is taken as imports plus exports to GDP. World GDP per capita is taken in current US dollars.

According to (Granger and Newbold, 1974) because of existence of time trend in series a time series data has to face the problem of non-stationarity. When a regression is applied on such non-stationary data it gives misleading results. In accordance with Philips (1986) results obtained from such regression are false when there is absence of any long run cointegration link among the variables. For presence of cointegration it is essential condition for data to be stationary. When variable are stationary and cointegrated the regression results of Ordinary Least Square (OLS) for such regression are satisfactory. In order to check the problem of non-stationarty in a time series data Ng and Perron (2001) and Dickey and Fuller (1981) tests are among the widely used tests of unit root.

3.6.1 Augmented Dicky-Flur Test (ADF)

ADF test is used for the detection of the unit root problem in the data, this test was introduced by Dickey and Fuller (1981).The generally ADF can be written as in the form of following.

$$\Delta Z_t = \alpha + \beta t + \delta Z_{t-1} + \sum_{i=1}^{q} \phi \Delta Z_{t-i} + \varepsilon_t \qquad (3.15)$$

Ho: $\delta=0$ There is unit root problem exists. And time series data is non-stationary.

Ha=$\delta<0$ Time series data is stationary

If critical Dickey-Fuller τ value is less than calculated Dickey-Fuller statistics then we reject H0 and conclude that the problem of unit root or non-stationary does not exist in the selected time series. When all of the time series included in our regression model are stationary then we apply OLS. In this study the time series data is used and most of the time series are not stationary.

3.6.2 ARDL Bound Testing Approach to Cointegration

Test of cointegration is used in this study to test long run equilibrium relationship among the variables used in analysis. Initially, the concept of co-integration was introduced by Engle and Granger (1987). Stock and Watson (1988), Johansen (1988, 1991, 1992, 1995), Johansen and Juselius (1990), Pesaran and Shin (1999) and Pesaran et al. (2001) extended and improved its testing procedures. Johansen and Juselius (1990) cointegration test and Pesaran et al. (2001) Auto-Regressive Distributed Lag (ARDL) are those tests which are widely used among the tests of cointegration. The current study uses ARDL test which follows bound testing procedure to test cointegration.

Apart from other existing tests of cointegration, ARDL bound testing test checks the presence of equilibrium relationship among the variables in long run regardless of either the variables have order of integration zero(I (0)), order of integration one(I (1)) or mix order of integration. As compared with Engle–Granger test of co-integration, ARDL test has better statistical properties. This test is developed on the basis of Unrestricted Vector Error Correction Model (UECM). Alam and Quazi (2003) proved that ARDL test is applicable even when the regressors are endogenous. Mah (2000) noted

that ARDL test has better statistical properties when it is used to analyze the small sample for checking the existence to cointegration.

3.7 Data Sources

The data used in this study includes the variables of export diversification index, geographic concentration index, foreign direct investment, real effective exchange rate, trade openness and world domestic product per capita. The data for the variables of foreign direct investment, real effective exchange rate, trade openness and world domestic product per capita is taken from World Development Indicators online database by World Bank (2014). Export concentration index was calculated by the author using the methods mentioned earlier in this chapter. The sectoral data for calculation of export concentration index was taken from WTO Statistical Database by World Trade Organization (2014). Geographic concentration index was also calculated by the author. Data required for calculation of geographic concentration index was taken from Handbook of Statistics on Pakistan Economy 2010 by State Bank of Pakistan (2010) and Annual Report 2013- 2014 by State Bank of Pakistan (2014).

CHAPTER 4

ESTIMATION AND RESULTS

This chapter includes the results of empirical investigation based on statistical analysis. This statistical analysis is aimed at identifying the determinants of export diversification in Pakistan. This study explains the existence of long run cointegration link among the variable in order to resolve the problem of this study. Thus we started to check the data for existence of unit root, as stationarity of data is essential to check the cointegration relationship. After measuring the order of integration of the variables we will be able to move towards cointegration.

4.1 DATA STATIONARITY

To check the stationarity of time series data, we used ADF test of unit root. In order to apply the ADF unit root test, for maximum lag selection Schwarz Information Criterion has been used. The results of ADF test have been stated in table 4.2. in accordance with these results variables of world gross domestic product per capita, export diversification, export concentration, geographic concentration of exports and real effective exchange rate are not stationary at level when we use ten percent level of significance. The variables of foreign direct investment and trade openness are stationary at level using ten percent level of significance. This implies that null hypothesis of unit root at level cannot be rejected for all variables except foreign direct investment and trade openness. Howeverat first difference all the variables are stationary. This shows that we use the first difference of the variables the null hypothesis of unit root for all variables is rejected. Thus the variables are having mix order of integration. Some of them are I(0) (integrated of order zero) and others are I(1) (integrated of order one).

Table 4.1
Export Diversification in case of Pakistan (1980-2012)

Years	EDIV	Years	EDIV	Year	EDIV
1980	51.69679	1991	45.70587	2002	45.53128
1981	52.01673	1992	45.84162	2003	47.58451
1982	50.59963	1993	44.38889	2004	47.3101
1983	49.44424	1994	43.27033	2005	48.73535
1984	48.78035	1995	44.93775	2006	49.11098
1985	49.06967	1996	44.37155	2007	50.62768
1986	48.52729	1997	44.13302	2008	52.89742
1987	47.1509	1998	45.63476	2009	50.90803
1988	48.48677	1999	45.78032	2010	52.07832
1989	47.63742	2000	45.85658	2011	53.08812
1990	45.98878	2001	45.8739	2012	49.79297

Source: Author's Calculations

Table 4.2
ADF Unit Root Test

Variable Name	Intercept			Intercept and time trend		
	ADF test stat	p-value	lags	ADF test stat	p-value	lags
At Level						
EDIV	-2.300540	0.1790	5	-1.795803	0.6832	0
GHI	-2.300540	0.1790	5	-1.795803	0.6832	0
WGDPC	0.642342	0.9887	0	-2.491197	0.3300	0
TO	-2.892418*	0.0574	0	-3.025517	0.1412	0
REER	-1.853520	0.3490	0	-0.766593	0.9585	0
GCI	-1.463383	0.5389	0	-1.839139	0.6619	0
FDI	-2.571339	0.1096	1	-5.879281***	0.0003	6
At 1st Difference						
ΔEDIV	-4.129383***	0.0032	1	-6.261491***	0.0001	0
ΔGHI	-5.573028***	0.0001	0	-5.277194***	0.0009	1
ΔWGDPC	-4.564418***	0.0010	0	-4.564874***	0.0051	0
ΔTO	-7.925487***	0.0000	0	-7.785564***	0.0000	0
ΔREER	-5.627188***	0.0001	0	-7.474839***	0.0000	0
ΔGCI	-5.733603***	0.0000	0	-4.692713***	0.0039	1
ΔFDI	-4.294209***	0.0029	8	-4.431064***	0.0097	8

*, ** and *** represent that we may reject the null hypothesis of unit root at 10%, 5% and 1% level of significance respectively.

Source: Author's Calculations

4.3 RESULTS OF COINTEGARTION TEST

In order to check the existence of long run relationship of export diversification, geographic concentration of exports, real effective exchange rate, World gross domestic product per capita, foreign direct investment and trade openness, ARDL bound testing approach to cointegration is used.

The results of ARDL cointegration test, are reported in table 4.3. Wald based F-statistic is used to test the null hypothesis of no cointegration among the variables. The wald statistics is 4.8848, which is greater than upper bound value of 4.5181 at five percent level of significance**.** Hence we can reject the null hypothesis of no cointegration and accept the alternative hypothesis which states that there is cointegrating relationship among the variables used in the study.

Thus the analysis of data confirms the presence of long run relationship among export diversification, geographic concentration of exports, real effective exchange rate, World gross domestic product per capita, foreign direct investment and trade openness in Pakistan.

Table 4.3
Bound Testing Approach to Cointegration ARDL (1,1,0,1,0,0)
(EDIV, GCI FDI, REER TO, WGDPC)

F-Statistic (Wald-Test) = 4.8848		
Level of Significance	**The Critical Value Bounds***	
	Lower Bound	**Upper Bound**
5%	**3.0693**	**4.5181**
10%	**2.5596**	**3.7883**

* The critical value bounds are computed by stochastic simulations using 20000 replications through Microfit 5.0.

Source: Author's Calculations

As cointegration exists among the variables used in the study, therefore, the results presented for long run are reliable. These results represent long run regression coefficients of export diversification with respect to its various determinants. The long run results are reported in table 4.5.

4.4 DIAGNOSTIC TESTS

Diagnostic tests are applied to check the validity of the assumptions of serial correlation, normality, model specification and heteroskedasticity. The results of these tests are presented in table 4.4.

These results indicate that the series of residuals obtained from ARDL model is normally distributed and there is no presence of heteroskedasticity. The specification of the model has also been tested through Ramsey's RESET test. This test suggests that the model is well specified. There is also no problem of serial correlation and heteroskedasticity.

Table 4.4
Diagnostic Tests
(EDIV, GCI FDI, REER TO, WGDPC)

Normality Test (Jarque-Bera Statistics)	Jarque-Bera Statistics = 1.8456	Probability = 0.397
Serial Correlation (Breush-Godfrey Serial Correlation LM Test)	F-Statistic = 2.5805	Probability = 0.123
Heteroskedasticity Test (Based on the regression of squared residuals on squared fitted values)	F-Statistic = 1.4705	Probability = 0.235
Model Specification Test (Ramsey RESET Test)	F-Statistic = 0.90680	Probability = 0.352

Source: Author's Calculations

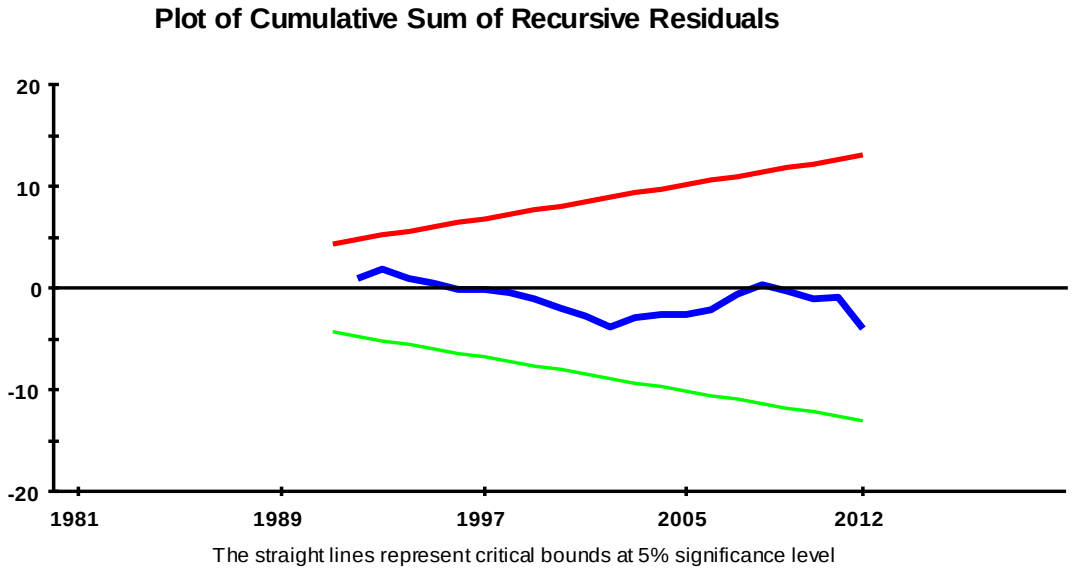

Figure 4.1: Cumulative Sum of Recursive Residuals (CUSUM)

To analyze the stability of the coefficients the cumulative sum of recursive residuals (CUSUM) is used. A graphical representation of CUSUM is shown in Figure 4.1. The null hypothesis that the ARDL regression equation is correctly specified cannot be rejected if the plot of these statistics remains within the critical boundaries of the 5% significance level. Figure 4.1 shows that the plots of the CUSUM is within the boundaries and hence these statistics confirm that the model is correctly specified.

Table 4.5
Long Run Relationships for the Selected ARDL (1,0,0,1,1,1)

Dependent Variable: EDIV			
Variable	**Coefficient**	**t-Statistic**	**p-Value**
GCI	-0.49522	-5.3740	0.0000
FDI	0.91045	2.2935	0.032
REER	0.066095	6.4510	0.0000
WDGPC	0.0014770	1.8086	0.084
TO	-0.35915	-2.5395	0.019
Constant	77.6550	4.9123	0.000

Source: Author's Calculations

Hence we reject the first null hypothesis i.e. geographic concentration does not affect the export diversification and accept the alternate hypothesis which states that geographic concentration does affect the export diversification. The results reported in the table 4.5 show that geographic concentration has negative and statistical significant relationship with export diversification. It indicates that less geographic concentration will be helpful in improving export diversification and more geographic concentration may result in lower degree of export diversification in Pakistan.

Hence we reject the second null hypothesis i.e. Foreign direct investment (FDI) does not affect the export diversification and accept the alternative hypothesis which states that foreign direct investment (FDI) does affect the export diversification. Foreign direct investment (FDI) has positive and statistically significant relationship with export diversification. It indicates that FDI is directly linked with export diversification. Increase in FDI as a percentage of GDP may lead to enhancement in the degree of export diversification. This result is statistically significant at five percent level of significance.

Hence we reject the third null hypothesis i.e. real effective exchange does not affect the export diversification and accept the alternative hypothesis which states that real effective exchange does affect the export diversification Real effective exchange rate has positive and statistically significant relationship with export diversification. It indicates that real effective exchange rate is directly linked with export diversification. Depreciation of domestic currency may lead to enhancement in degree of export diversification. This result is statistically significant at five percent level of significance.

Hence we reject the fourth null hypothesis i.e. world gross domestic product per capita does not affect the export diversification and accept the alternative hypothesis which states that world gross domestic product per capita does affect the export diversification. World gross domestic product per capita has positive and statistically significant relationship with export diversification. It indicates that world gross domestic product per capita is directly linked with export diversification. Increase in world gross domestic product per capita may lead to enhancement in the degree of export diversification. This result is statistically significant at ten percent level of significance. This result is statistically significant at five percent level of significance.

Hence we reject the fifth null hypothesis i.e. trade openness does not affect the export diversification and accept the alternative hypothesis which states that trade openness does affect the export diversification. Similarly, the coefficient of trade openness has negative sign in the regression of export diversification. This result seems to be statistically significant at five percent level of significance. This indicates that in Pakistan trade openness, which is measured through ratio of trade volume to gross domestic product, has significant role in determining the degree of export diversification. But it also highlights the finding that increase in the degree of trade openness may lead to export concentration instead of export diversification.

4.5 SHORT RUN ESTIMATES

After the confirmation of existence of cointegration among the variables, further step is to check the short run dynamics by using ECM. Table 4.6 shows the short run dynamics of our long run equilibrium. According to the table geographic concentration of exports, foreign direct investment and real effective exchange rate have statistically significant effect on export diversification in short run while the impact of world gross

domestic product per capita and trade openness seems to be statistically insignificant in short run.

Table 4.6
Short Run Estimates for the Selected ARDL (1,0,0,1,1,1)

Dependent Variable = ΔEDIV			
Variable	Coefficient	t-Statistic	p-Value
ΔGCI	-0.40510	-4.5074	0.000
ΔFDI	0.74476	2.8911	0.008
ΔREER	0.091432	4.5209	0.000
ΔWDGPC	0.0015733	0.93297	0.360
ΔTO	-0.058697	-0.70887	0.485
ecm(-1)	-0.81801	-4.9692	0.000
Constant	-	-	-
R2 = 0.73812 Adj-R2 = 0.63099 F-Statistic = 10.3349 Prob(F-statistic) = 0.000 Durbin-Watson = 2.1768			

Source: Author's Calculations

The lag of error correction term has a negative sign and is statistically significant. It is further reinforcement of the stability of long run equilibrium relationship among the variables. The results, reported in table 4.6, show that the coefficient of the lag of error correction term (ecm(-1)) is -0. 81801 which indicates that the variables will converge towards their long run equilibrium if any shock occurs in short run. The speed of convergence or error correction would be almost eighty-two percent per annum. In this way the full restoration of long run equilibrium will take almost one year, two months and twenty days.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATIONS

Conclusion of the study based on statistical analysis is presented in this chapter. In the light of empirical analysis some policy implications and recommendations are suggested.

5.1 CONCLUSION

This thesis is aimed at measuring the degree of export diversification in Pakistan and finding its determinants. For this purpose GHI is used to calculate the degree export diversification. In order to find out the determinants of export diversification annual time series data is used from 1980 to 2012. ARDL bound testing approach to cointegration is used to analyze the long run relationship of export diversification and its various determinants like foreign direct investment, world gross domestic product per capita, geographic concentration, real effective exchange rate and trade openness.

Empirical results reveal that there is a long run equilibrium relationship between export diversification and its determinants. Long run coefficients represent the slopes of export diversification with respect to foreign direct investment, world gross domestic product per capita, geographic concentration, real effective exchange rate and trade openness. The impact of world gross domestic product per capita, foreign direct investment and real effective exchange rate at five percent level is positive and statistically significant on export diversification. Trade openness and geographic concentration influence the diversification of exports negatively and this relationship also seems to be statistically significant at five percent level of significant in case of Pakistan.

The estimates of error correction model indicate that lag of error correction term is statistically significant and has a negative sign. The coefficient of the lag of error correction term indicates that the variables will converge towards their long run equilibrium if any shock occurs in short run. The speed of convergence or error correction would be almost eighty-two percent per annum. In this way the full restoration of long run equilibrium will take almost one year, two months and twenty days.

5.2 POLICY IMPLEMENTATIONS

The consequences of present study have thoughtful policy implications. In accordance with empirical findings it is suggested that the exchange rate policies which directly affect the price of exports, will be helpful in diversifying exports in Pakistan. Devaluation of domestic currency may be very useful in accelerating volume of exports as a result Pakistani exporters may be able to enter into the new markets which are considered price sensitive. This may also involve the domestic exporters in price competition in international market which may result in improving productive efficiency and scale economies.

The estimates reveal that foreign direct investment positively influence the degree of trade diversification. It implies that Pakistani policy makers should encourage and facilitate the foreign investors to invest in export oriented sectors in Pakistan. This may also be helpful in bridging the saving-investment gap in Pakistan and improving the productivity of domestic firms.

The findings of this study indicate that geographic concentration of exports enhances product concentration in exports. It means focus on a few markets discourage products diversification in exports and may lead to unstable trade balance which may be dependent on the economic stability or instability of a few countries. The policy makers in Pakistan should seriously consider the market diversification in order to ensure and enhance higher degree of product diversification in export market for stable and improved trade balance.

In case of Pakistan, because of increase in trade openness, producers kept focusing on those products in which either Pakistan have comparative advantages, or in those products which have been revenue oriented for producers. This trend increased concentration and reduced diversification.

The estimates reveal that world income, measured by world gross domestic product per capita, positively influence the degree of trade diversification. It implies that Pakistani policy makers should design and adopt trade strategies which may facilitate and encourage the domestic exporters to get benefits from world income growth. This may also be helpful in enhancing the Pakistan’s share in world trade and to improve the balance of trade.

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APPENDIX

Table A-1
Data Used in this Study

Years	EDIV	GHI	GCI	FDI	REER	WGDPC	TO
1980	51.69679	48.30321	73.05939	0.26861	202.05	5050	36.5872
1981	52.01673	47.98327	74.69068	0.384635	229.0748	5070	35.32949
1982	50.59963	49.40037	71.33289	0.20775	209.8324	5000	31.71009
1983	49.44424	50.55576	76.30659	0.102667	202.6758	5040	34.89608
1984	48.78035	51.21965	76.78397	0.178192	206.9516	5180	33.69653
1985	49.06967	50.93033	74.25737	0.421864	193.3109	5290	33.23753
1986	48.52729	51.47271	69.7888	0.331453	159.5278	5370	34.56735
1987	47.1509	52.8491	69.71232	0.387921	141.048	5460	34.23846
1988	48.48677	51.51323	70.02839	0.484737	136.748	5610	35.25661
1989	47.63742	52.36258	72.18834	0.524258	128.0939	5730	35.63007
1990	45.98878	54.01122	70.5417	0.612998	121.1357	5790	38.90949
1991	45.70587	54.29413	69.30122	0.568544	118.6315	5770	35.55468
1992	45.84162	54.15838	72.96222	0.691844	116.5757	5790	37.88786
1993	44.38889	55.61111	75.29217	0.677094	115.1499	5790	38.74735
1994	43.27033	56.72967	75.84559	0.811304	114.3382	5890	35.32705
1995	44.93775	55.06225	74.40716	1.191752	113.5966	5970	36.13275
1996	44.37155	55.62845	75.00043	1.456054	110.5907	6080	38.33013
1997	44.13302	55.86698	75.82025	1.147229	112.1032	6220	36.85227
1998	45.63476	54.36524	74.56928	0.81361	113.6866	6290	34.01173
1999	45.78032	54.21968	74.95751	0.844795	105.1975	6420	32.31996
2000	45.85658	54.14342	76.25736	0.416484	103.2108	6610	28.12961
2001	45.8739	54.1261	75.28275	0.529666	93.80255	6640	30.37153
2002	45.53128	54.46872	75.05463	1.138205	97.14836	6690	30.53763
2003	47.58451	52.41549	74.16676	0.641482	94.42255	6790	32.8445
2004	47.3101	52.6899	74.03257	1.141075	93.74255	6990	30.30013
2005	48.73535	51.26465	72.19446	2.010007	96.66753	7160	35.25329
2006	49.11098	50.88902	71.8229	3.112978	99.38001	7370	35.68173
2007	50.62768	49.37232	71.37521	3.668323	98.12835	7570	32.99043
2008	52.89742	47.10258	67.22376	3.19736	94.49505	7590	35.5942
2009	50.90803	49.09197	67.23777	1.390402	95.13921	7340	32.07185
2010	52.07832	47.92168	66.65565	1.137498	100	7550	32.86893
2011	53.08812	46.91188	66.58412	0.611993	102.8316	7680	32.92472
2012	49.79297	50.20703	67.45765	0.379172	104.365	7770	32.59296

Sources: WTO Statistics Database (online), The Pakistan Economic Survey (Various Issues), World Development Indicators (online database) and author's calculations