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## Article

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## **Implications of Export Competitiveness, and Performance of Textile and Clothing Sector of Pakistan: Pre and Post Quota Analysis**

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### **Abstract**

Textile and Clothing sector of Pakistan has been facing different international trade reforms i.e. Multi-fiber Arrangements, Quota elimination and for some of the developing countries European union, introduced special trade arrangements like GSP plus to improve their balance of trade conditions. In the light of pre quota elimination and post quota elimination periods, this paper highlights trade performance of textile and clothing sector in depth. This study focused on finding the extent of revealed comparative advantage of textile and revealed comparative advantage of clothing sector on overall textile and clothing trade performance of Pakistan. For this purpose study applied Johansen co-integration to check long run relationship among trade performance, revealed comparative advantage of textile and revealed comparative advantage of clothing sector. This study found that textile sector has been significantly contributing in trade performance of textile and clothing sector over all, instead of clothing sector of Pakistan. Moreover, study observed that textile and clothing sector did not get benefit of quota elimination as it was expected.

**Key Words:** quota elimination, multi-fiber arrangements, geographic concentration, constant market share, quota elimination

### **1. Introduction**

According to World Bank Report, “ *Globalization, Growth and Poverty: Building on inclusive World Economy* (2002)” 24 developing countries achieved higher growth, better schooling and life expectancy due to their assimilation in world economy. Apart from foreign direct investment exports have been one of the determinants of this achievement. Developing countries can expand their markets by allowing firms exporting and achieving economies of scale. Exporting is a one of the channels of technology transfer to other countries (Pack. 1993). Generally industrial policies are made to stimulate exports.

The export competitiveness or export performance in general can be measured by many factors such as real exchange rate, comparative advantage, terms of trade, geographic concentration, state of technology, trade policies, world income etc. This study examines the impact of quota elimination on export performance of textile and clothing sector of Pakistan. Trade policy in Pakistan has major role in increasing or decreasing overall exports of Pakistan. Pakistan's economy has relied on agricultural sector in the early stages of development, because Pakistan was lacking in industrial base and infrastructural facility in early period of development. Therefore, efforts were put to build strong industrial base for industrial and Pakistan's development. Due to favorable export policies such as reduction in tariffs and other non-tariff measures changed export pattern of Pakistan. Being a fourth larger producer of cotton production, Pakistan's textile and clothing sector flourished over time. This sector has great potential of export and one of the major sources of employment. The performance of textile and clothing sector has been inconsistent after quota elimination. Volatile performance of this industry can be attributed by prices of raw material, particularly cotton, international competition and trade policies of importing countries, which in turn determine the production of cotton. Trade in textile and clothing has been regulated in many forms since last many decades. In 1970s new regime of low trade restrictions and competition was initiated under General Agreement on Tariffs and Trade (GATT). Developed countries introduced quota restrictions on the exports of developing countries in 1974 to protect their industries from competition. This quota restriction was named as Multi-Fiber Arrangements (MFA). In the Uruguay round it was decided to put quota restrictions in dismantle. Later MFA was replaced by Agreement on Textile and Clothing (ATC). With the existence of WTO in 1995, it was decided to eliminate quota restrictions in four phases of subsequent 10 years (1995-2005).

Though, Pakistan's textile and clothing sector could not get benefit of quota elimination so far (Ahmad and Kalim, 2013). According to Ahmad and Kalim (2013) RCA of textile and clothing products at 3-digit SITC, reveals that after quota elimination comparative advantage of SITC 269, 651, 652, 655, 658, 659, 841, 843, 844, 845, 846, and 848 declined with the passage of time and for some commodities remained volatile. However, comparative advantage of SITC-842 improved in the year of 2010 and 2011. Over all it has shown mixed trend in the context of RCA. Saboniene (2011) calculated RCA for certain manufacturing commodities of the Lithuanian economy. The inference of this study was that economic crisis in the country has lowered export volume and reduced foreign direct investment. This study further revealed that Lithuanian economy had comparative advantage in the exports of traditional commodities such as textile and clothing, leather and foodstuffs.

### *1.1 Performance of Textile and Clothing Sector of Pakistan*

Textile sector contributes 8.5 percent of GDP and provides 15 million employments, which is 30 percent of total work force of 49million in Pakistan. Textile is an agro-based industry; and Pakistan is a major producer of cotton, therefore foremost stress has been given to the development of this sector for reaping benefits of the abundant resources of cotton. At present, Pakistan has 521 textile units, 1221 ginning units, 124 large spinning units, 471 spinning units, and 425 small units which are sources of textile products (Government of Pakistan, 2009). Table 1.1 shows present picture of Pakistan's textile and clothing export share in the world trade.

**Table 1: Export of Textile and Clothing (US \$ billions)**

	<b>2000</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
World Textile	157.3	195.5	202.7	220.4	240.4	250.2	211.0
World Clothing	197.7	260.6	276.8	309.1	345.8	361.9	316.0
<b>Total</b>	<b>355.0</b>	<b>456.1</b>	<b>479.5</b>	<b>529.5</b>	<b>586.2</b>	<b>613.1</b>	<b>527.1</b>
Pakistan Textile	4.5	6.1	7.1	7.5	7.4	7.2	6.5
Pakistan Clothing	2.1	3.0	3.6	3.9	3.8	3.9	3.0
<b>Total</b>	<b>6.7</b>	<b>9.1</b>	<b>10.7</b>	<b>11.4</b>	<b>11.2</b>	<b>11.1</b>	<b>9.5</b>
%age of World Trade	1.88	2.01	2.23	2.15	1.91	1.81	1.80

Source: WTO (2010)

Since 2000, Government of Pakistan started emphasizing on the growth of value added production of textile sector and its exports. For this purpose comprehensive Textile Vision-2000 policy was formulated with the aims of bringing innovations, market driven strategy, to encounter challenges of WTO. However, the progress of value added production of weaving and spinning sectors has not been satisfactory in the beginning of this decade. The production of yarn was 1541 million kg in the years 1997-98 and it increased by 277 million kg in the years 2001-02 which was increment of 4 percent per annum on average. However, blended yarn's share in the total production of yarn decreased from 33 percent to 24 percent during the period from 1997-98 to 2001-02 All Pakistan Textiles Mills Association (APTMA, 2002).

Due to tax relief by the Government of Pakistan to textile industry, export reached to US \$ 11.031billion against the set target of \$ 10.4 billion. Government also exempted additional tax on yarn manufacturers and suppliers in 2003. The emergence of WTO and entrance of China into WTO severely affected other exporting countries of textile products and producers.

The textile industry remained incapable of achieving benefits of post quota regime. As far as investment in textile sector is concerned, it remained about US \$ 7.5 billion during the period from 1999 to 2009. The imports of textile machinery have been declining since 2004. From the year 2004 till 2009 it declined by 46 percent (Economic Survey of Pakistan, 2009). The growth trend of textile sector has shown volatility, it improved until 2004-05 later it started declining and in the year ended 2010-11 it improved by 1 percent.

Increase in prices of raw cotton globally has increased the input cost and prices of textile products which resultantly increased export earnings of textile sector of Pakistan from US\$ 7663.8 million to US\$ 9956.5 million from the year 2009 to 2011. Cotton and synthetic products are exported in the form of readymade garments, bed wear, yarn, fabric etc.

In the year 2010-11 improvement in the performance of textile industry is due to increase in unit values of all categories of textile products, resultantly textile export increased by US\$ 2760 million in absolute terms. Despite increase in prices of textile goods, export demand of textile products increased from EU and US. Pakistan's textile produces high quality yarn and exports instead of using for high value added products like garments and fabric. Japan, Hong Kong, and South Korea are major importer of this good quality Yarn of Pakistan's textile sector.

## 2. Literature Review

Export pattern of Pakistan is extremely concentrated in terms of product classification. The reason behind is dependency on agricultural based commodities such as cotton. Therefore, cotton oriented manufactured products such as yarn, knitted; cotton clothes and woven products of Pakistan captured the demand of foreign markets. Commodity concentration deteriorated over all exports earning not only of Pakistan but of other developing countries too. The reason is greater dependency on primary products instead of commodity diversification. Tariq and Najeel (1995) had drawn the same inference that commodity concentration in Pakistan has yielded significantly positive effect on exports earning instability in Pakistan. In Indonesia, a study was conducted at firm level using a unique data set. This study contributed to analyze firms export behavior of manufacturing plants in Indonesia. According to this study export behavior of firms differ due to differences in their technology (Dosi, 1988). Technology, research and development are important variables in determining exports (Wagner, 2001). In the history of international trade theories like Heckscher-Ohlin model was based on very strong assumptions of no economies scale, perfect competition and constant technology, but after eighties new theories of trade relaxed some rigorous assumptions to analyze other sources of comparative advantage. Therefore in new models some assumptions were incorporated such as imperfect competition, economies of scale and these assumptions also determine trade pattern (Helleiner, 1992). According to Dosi et al. (1990) technological gap and new technology determines international trade patterns.

Some researcher focused on firm size as one of the variables affecting international trade patterns (Bonaccorsi, 1992 and Berry, 1992 for overviews). An inverted U-shaped relationship was found between size of the firm and degree of exports (Wagner, 1995; Kumar and Siddharthan, 1994). Though size of firm matters but for very large firms this may not be advantageous if products of firms are domestic market oriented and firms enjoy monopoly that does not give any incentive to export Wakelin, (1998). According to researchers, both internal and external factors determine export performance. Internal factors are related to supply side factors while external factors include geographic concentration, market access and other countries trade policies. Foreign demand greatly influences on export performance. If countries have close borders or located in same region may have greater demand of products than country located away or outside the region. Export earnings of a country may be affected by geographic concentration and concentration of particular export commodities (Aslam 1985, Massell 1963). According to Funke and Holly (1992) most of the studies in passed have focused on demand side factors to explain long run determinants of export performance, his study focused on both demand and supply side determinants to measure export performance of manufacturing sector of West German. The findings of this study revealed that supply side factors are more important than demand side factors of export performance.

Sharma (2000) estimated the determinants of export for Indian economy for the period 1970-98. This study revealed that when domestic prices fall than world prices, export demand increases. Further, study found that supply of exports is positively related with domestic prices, and with the rise in domestic prices, domestic supply also increases. On the other hand foreign direct investment has positive but insignificant impact on export performance. Developing countries emphasized to increase their share of exports in world trade. To this end Bacchetta (2007) analyzed that many developing countries have

increased their share in world trade from one quarter to one third approximately. Asian countries particularly China increased its share because of product diversification. According to findings of this study Asian countries had share about 11.7% in world export in 1985, which increased to 21.5% in 2005. While share of African countries decreased from 4.3% to 2.9% during the same period. Poor performance of African countries was attributed to the dependence on primary products. Infrastructural facilities play an important role in export performance as it affects supply capacity of a country. Santos (2000) observed the strong relation between export growth and liberalization of trade and found relaxing anti-export bias increased export competitiveness in several developing countries such as Pakistan, India, Malawi and Tunisia. This study estimated export demand function by using panel data and applied fixed effects. The inferences drawn by this study were according to demand function theory. The increase in relative prices would reduce the level of exports and world income as a demand component would increase the level of exports. However, export duties reduced the level of exports but have shown insignificant impact on export growth. Trade liberalization increased the level of exports and yielded highly significant impact on the growth of exports.

Hossain and Alauddin (2005) conducted a study on export structure and trade liberalization in Bangladesh considering Structural Adjustment Program (SAP) and its effects on export growth. Bangladesh's major exports were from textile and clothing sector which grew due to trade liberalization. This study estimated the effects of import to GDP ratio and trade policy bias on export growth by applying ARDL technique to co-integration. This study found positive impact of trade liberalization on export growth in the long run. Despite the transition from traditional exports to industrial exports, study found that Bangladesh is still lacking in product diversification. According to Bacchetta (2007) transport infrastructure has been impediment in export performance, competitiveness and sustainable development. Berman and Hericourt (2008) explained the role of financial development in export performance of a country. Using cross sectional data of firms of developing economies, they found financial constraints are the cause of low productivity and consequently low export. They were of the view that financial development is one of the sources of increasing exporters and export performance.

Carballo and Volpe (2009) analyzed exports of Peru for the period 2000 to 2006 and found large firms have more chances to survive in the markets. Further, product and geographical diversification are necessary for increasing export performance and increase the survival duration in the market. According to them larger firms have more ability to bear sunk cost to stay and enter in the export markets. Besedes and Blyde (2010) used data of SITC 4 digit level commodities to find factors that determine export survival rates across many countries. The main findings of the study are import demand elasticity of the goods, transportation cost, and distance explain survival and export market. Consistency of staying in market depends on common language, common border and size of partner countries. Ratnaik (2012) estimated empirical relation between export performance and trade liberalization for 27 OECD countries. This study took into account two measures for trade liberalization i.e. tariff and degree of openness. Using panel data from the period 1980 to 2010, this study also estimated steady state situation. To analyze export performance this study captures the impact of real effective exchange rates, average tariff rates, for sample and domestic countries. This study found significant impact of trade

openness and domestic tariff rate on export performance. Trade liberalization policies in OECD countries have been major contributors in export performance of these countries.

Cadot et al. (2013) found that survival in market increases, when large number of firms enters in market for same product from same countries to same destinations. This study was conducted on four African countries i.e. Mali, Malawi, Tanzania and Senegal. This study also found that those firms having products diversification and explore more markets were successful in capturing markets and survival.

### **3. Data Sources**

To measure export performance of textile and clothing sector of Pakistan, this study focuses on variables such as geographical concentration, real effective exchange rate, real world per capita income, revealed comparative advantage (RCA) of textile and clothing sector, export value of textile and clothing and dummy for trade liberalization or quota removal period. The data on RCA has been obtained from the calculation of Ahmad and Kalim (2013). For analysis study used the period from 1980 to 2011. This paper explores long run equilibrium among the variables of study through co-integration approach.

#### *3.1 Geographical Concentration*

Geographic concentration or market concentration and commodity concentration are important determinants of export performance Aslam (1985) and Massell (1963). Tariq and Najeeb (1995) estimated insignificant but positive impact of geographic concentration on export performance. Export performance may be affected if fewer markets or countries are focused. Textile and clothing sector exports and overall exports of Pakistan are overwhelmingly geographical concentrated that can make vulnerable position of Pakistan's exports because of unfavorable policies of major trading partners. Therefore this study took into account geographic concentration by selecting seven major countries which have been trading partner of Pakistan over time. These countries are US, UK, Germany, UAE, Hong Kong, Japan and Saudi Arabia. An average of exports from Pakistan to these seven countries is estimated for geographical concentration. For this purpose data is taken from the website of UNCTAD and various issues of Economic Survey of Pakistan.

#### *3.2 World Real per Capita Income*

Export performance of any country also depends on buying ability of trading partner. Therefore this study captures the effect of ability by taking world real per capita income. The data has been taken from world development indicator (2013).

#### *3.3 Real Effective Exchange Rate*

In their study of Zulfiqar and Kausar (2012) found negative and significant impact of real effective exchange rate on export performance of Pakistan. Similarly, Jenkins (1995) revealed that real effective exchange rate (REER) is important determinant affecting export performance in least developing countries. Therefore this study also captures the effect of real exchange rate on export performance. Data of REER is taken from the website of world Development Indicator (WDI) 2013.

#### *3.4 Revealed Comparative Advantage*

According to comparative advantage theory a country should produce and export those commodities in which its resources are abundant for the production of that good. This simply means if country has comparative advantage its export performance may improve. Some studies have used constant market share analysis variable to see the country's share of export. This study used RCA of textile and clothing sector separately. Data of RCA is taken from the study of (Ahmad and Kalim, (2013).



**Table 2: Data on Revealed Comparative Advantage on Textile and Clothing Sector of Pakistan.**

<b>Years</b>	<b>RCA of Textile Sector of Pakistan</b>	<b>RCA of Clothing Sector of Pakistan</b>
1972	5.048	0.190
1973	10.547	0.401
1974	9.494	0.755
1975	11.908	0.971
1976	11.898	1.252
1977	12.613	1.480
1978	11.651	1.060
1979	13.527	1.071
1980	12.447	1.469
1981	12.287	1.712
1982	14.406	2.219
1983	15.401	2.653
1984	14.079	3.438
1985	12.421	3.278
1986	11.739	4.300
1987	13.388	4.383
1988	13.438	4.643
1989	13.836	4.950
1990	15.674	5.968
1991	15.743	5.948
1992	15.693	6.307
1993	17.397	7.728
1994	17.692	7.005
<b>Post Quota</b>		
1995	17.971	6.802
1996	18.579	7.070
1997	18.888	7.419
1998	18.551	7.934
1999	19.740	8.558
2000	20.590	9.740
2001	20.302	9.583
2002	20.154	9.374
2003	21.115	9.847
2004	21.438	10.591
2005	22.634	11.51
2006	24.242	12.68
2007	24.282	12.53
2008	22.873	12.43
2009	22.114	11.12
2010	22.206	9.938

Source: Ahmad and Kalim (2013)

### 3.5 Exports of Textile and Clothing

Export value of textile and clothing sector is taken as dependent variable. Value of both textile and clothing are added. The values are in million US \$ taken from the website of WTO.

### 3.6 Quota Elimination

Various studies observed the impact of trade liberalization on export performance. The results of these studies shown mixed trend, some had shown significant and some had shown insignificant impact of trade liberalization on exports. It is generally believed that trade liberalization itself cannot achieve long term objectives but with other control variables accompanied with trade liberalization influence on exports. Berges (2007) studied the implications of trade liberalization on the growth of total exports. In this time series study, for the period from 1905 to 2005 of Dominican economy, it was found that exchange rate policy and tariff reforms by US yielded profound effects on exports on Dominican economy. Morrissey and Mold (2006) did not find a significant impact of trade liberalization on African's export performance. This was the panel study of 48 African's countries. In Pakistan many studies have estimated the impact of trade liberalization on exports. But in case of textile and clothing sector quota elimination is considered liberalized trade policy by European Union. Since this is a policy variable, particularly in the context of textile and clothing sector, where MFA, ATC were in operation under GATT. In 1995, WTO announced to phase out MFA in order to liberalize trade of textile and clothing products of developing countries. Therefore, a dummy of quota elimination is taken in this study.

## 4. Methodology and Results

Though export performance may be affected by several variables. But this study captures the role of key variables affecting export performance of textile and clothing sector of Pakistan. All variables are in logarithm forms. Since this is time series study, therefore study first will check stationarity of variables by applying unit root test. Then on the basis of order of integration or stationarity of the variables study aims to apply co-integration. Once integration of variables is established a maximum likelihood approach as developed by Johansen (1991) is applied. This approach is based on a finite vector autoregressive model. The justification for the application of this technique is that all the variables must be stationary at same order. Therefore, study applies unit root technique to check the order of integration then Johansen (1988) and Johansen and Juselius (1990) a general system of regression based on VAR is used to see long run equilibrium among the variables of study. To find the determinants of export performance, study developed the following model.

$$LEXP_t = \alpha_1 + \alpha_2 LWY_t + \alpha_3 LREER_t + \alpha_4 LRCAT_t + \alpha_5 LRCAC_t + \alpha_6 LGC_t + \mu_t$$

Where

$LEXP_t$  represents export value in million US dollars of textile and clothing at time  $t$ .

$LWY_t$  represents real world per capita income at time  $t$ .

$LREER_t$  represents real effective exchange rate at time  $t$ .

$LRCAT_t$  shows revealed comparative advantage of textile sector of Pakistan at time  $t$ .

$LRCAC$  shows revealed comparative advantage of clothing sector of Pakistan at time  $t$ .

$LGC_t$  represents geographical concentration of Pakistan's exports at time  $t$

#### 4.1 Unit Root Test

Since time series data has problem of stationarity in macroeconomic variables (Nelson and Plosser, 1982). Therefore, to estimate unit root, present study applies Ng-Perron (2001) unit root test due to good size and high power for small sample. The results of unit root estimations are presented in the table 3.

**Table 3: Unit Root Estimations**

N-g Perron at Level with constant				
Variables	Mza	Mzt	MSB	MPT
$LEXP_t$	0.97295	0.96934	0.99629	68.5162
$LGC_t$	-10.1463	-1.94605	0.19180	3.52159
$LWY_t$	0.32415	0.17791	0.54883	22.8652
$LRCAC_t$	-8.32222	-1.91215	0.22976	3.40944
$LRCAT_t$	-1.42917	-0.73704	0.51572	14.6582
$LREER_t$	-0.03078	-0.02881	0.93600	49.3443

Source: Authors calculation

The results given in the table 3 indicate that all the variables are non-stationary at 1%, 5%, 10% level of significance. The decision regarding stationarity is made on the basis of the null hypotheses that if calculated value of NG- Perron test (Mza) is less than tabulated value, we reject null hypotheses of a unit root. All the calculated values in this table were greater than tabulated value. Therefore, we cannot reject null hypotheses and all variables have the problem of unit root. Since variables of study are not stationary at level or  $I(0)$ , therefore study analyzes unit root at 1<sup>st</sup> difference with constant and its results are presented in table 4.

**Table 4: Unit Root Estimations with 1<sup>st</sup> Difference**

N-g Perron at 1 <sup>st</sup> Difference with Constant				
Variables	Mza	Mzt	MSB	MPT
$DLEXP_t$	-14.9830***	-2.73187	0.18233	1.65468
$DLGC_t$	-2.30800***	-0.89785	0.38902	9.45743
$DLNGDP_t$	-11.9326***	-2.43319	0.20391	2.08952
$DLRCAC_t$	0.42530***	1.44741	3.40325	641.035
$DLRCAT_t$	-14.4767***	-2.56587	0.17724	2.15200
$DLREER_t$	-5.03390***	-1.58647	0.31516	4.86706

Source: Authors calculation: \*\*\* indicating 1%, significance level

The results given in table 4 indicate that all the variables of study are stationary at 1<sup>st</sup> difference. The null hypothesis of unit root problem is rejected at 1%, 5% and 10% level of significance. The calculated value of NG- Perron test (Mza) is less than tabulated value, in all variables, therefore all the variables are stationary at 1<sup>st</sup> difference.

#### 4.2 Johansen's Maximum Likelihood to Co-integration

Since all the desired variables in this model are stationary at same level i.e. 1<sup>st</sup> difference I (1), therefore this study applies Johansson's Maximum likelihood to check long run relationship among the variables taken in the model. For checking co-integration or long run relationship, lag first lag length is selected.

##### 4.2.1 Optimal Lag Length

For optimal lag length criteria, we have Final Prediction Error, Likelihood Ratio, Akaike Information Criterion, Schwarz Information Criterion and Hannan-Quinn Information criterion. The results of order selection criteria are mentioned in the table 5.

**Table 5: VAR Lag Order Selection Criteria**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	285.2256	NA	3.32e-16	-18.6150	-18.33480	-18.52539
1	447.7260	249.167*	7.60e-20	-27.0484	-25.08672*	-26.42084*
2	491.3724	49.4659	.26e-20*	-27.55816*	-23.91505	-26.39270
* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error AIC: Akaike information criterion SC: Schwarz information criterion HQ: Hannan-Quinn information criterion						

Source: Authors Calculation

Optimal lag length is 2 by using AIC criterion selected from table 5.

##### 4.2.2 Results of Johansen Co-integration

As this study reported the results in table 4 that all variables have same order of integration, therefore to check long run relationship among variables i.e. export value of textile and clothing sector, RCA of textile, RCA of clothing, geographic concentration, real effective exchange rate, and world real per capita income, the study applies Johansen co-integration.

The results of Johansen's co-integration are mentioned in table 6 and 7. Both the Trace Statistic  $\lambda_{trace}$  and Maximum Eigen Statistic  $\lambda_{max}$  are used to check co-integration and number of co-integrating vectors. Both statistics verify the existence of co-integration among the variables of study.

**Table 6: Unrestricted Co-integration Rank Test (Trace)**

H <sub>0</sub>	H <sub>1</sub>	Trace Statistic	0.05 Critical Value	Prob. <sup>a</sup>
r = 0*	r ≥ 1	193.4852	95.75366	0.0000
r ≤ 1 *	r ≥ 2	125.9870	69.81889	0.0000
r ≤ 2 *	r ≥ 3	73.48845	47.85613	0.0000
r ≤ 3 *	r ≥ 4	41.62295	29.79707	0.0014
r ≤ 4 *	r ≥ 5	19.43515	15.49471	0.0121
r ≤ 5 *	r ≥ 6	6.276648	3.841466	0.0122

<sup>a</sup>MacKinnon-Haug-Michelis (1999) p-values

\* denotes rejection of the hypothesis at the 0.05 level

We can use both statistics to test the null hypotheses of no co-integration in the model against the alternative hypotheses of co-integration. In table 6 trace statistic is tested to check the null hypotheses of no co-integration ( $r \leq 0$ ) among the variables. The trace statistic in this co-integrating vector is 193.4852 which are greater than critical value of 95.75366 at 5 % level of significance. Therefore a null hypothesis is rejected. In the second co-integrating vector trace statistic is 125.9870 which is greater than critical value of 69.81889 at 5% level of significance rejecting null hypotheses ( $r \leq 2$ ) of no co-integration against  $r=2$ . Similarly all the co-integration vectors having trace statistics values are greater than the critical values at 5% level of significance and reject null hypotheses of no co-integration against alternate hypotheses of the existence of co-integration in the model. Therefore, study found six co-integrating vectors which indicate the existence of long-run relationship among variables.

Maximum Eigen values are also used to check the null hypotheses of no co-integration i.e. ( $r \leq 0$ ). The results of Maximum Eigen value are shown in table 7

**Table 7: Unrestricted Co-integration Rank Test (Maximum Eigen Value)**

$H_0$	$H_1$	Max-Eigen Statistics	0.05 Critical Value	Prob. <sup>a</sup>
$r = 0^*$	$r \geq 1$	67.49818	40.07757	0.0000
$r \leq 1^*$	$r \geq 2$	52.49854	33.87687	0.0001
$r \leq 2^*$	$r \geq 3$	31.86550	27.58434	0.0132
$r \leq 3^*$	$r \geq 4$	22.18780	21.13162	0.0354
$r \leq 4^*$	$r \geq 5$	13.15850	14.26460	0.0742
$r \leq 5^*$	$r \geq 6$	6.276648	3.841466	0.0122

<sup>a</sup>MacKinnon-Haug-Michelis (1999) p-values.

\* denotes rejection of the hypothesis at the 0.05 level

Results given in table 7 show that there are five co-integrating vectors that is significant at 5% level of significance. Maximum Eigen statistics are greater than critical statistic at 5% level of significance. This indicates the presence of co-integration among the variables in this model of study. The above analysis indicates the existence of long run relationship among exports of textile and clothing, geographic concentration, real effective exchange rate, RCA of textile, RCA of clothing and world real per capita income. Due to the existence of co-integration among variables, OLS results would be reliable. Therefore study applied OLS to analyze long run coefficients. The results of long run coefficients are reported in table 8.

**Table 8: Long-Run Coefficients of the Model**

<b>Dependent Variable = <math>LEXP_t</math></b>			
<b>Variables</b>	<b>Coefficient</b>	<b>T-Statistic</b>	<b>Prob-value</b>
Constant	1.279811	0.479095	0.6359
$LGC_t$	0.119433	0.344526	0.7332
$LWY_t$	0.868608**	2.303704	0.0295
$LRCAC_t$	0.085014	1.159144	0.2569
$LRCAT_t$	0.642609**	2.561735	0.0166
$LREER_t$	-0.889707**	-2.265792	0.0320
R-squared = 0.982305			
Adj- R –Squared = 0.978902			
F-Statistic =288.66			
Prob (F- Statistic) =0.000			
Durbin Watson =1.5876			

Source: Author's calculation

\*\* shows 5% level of significance

The results given in table 8 show the impact of geographic concentration, world real per capita income, RCA of textile, RCA of clothing, and real effective exchange rate on the export performance of textile and clothing sector of Pakistan. All the explanatory variables have right sign in terms of their impact on export performance. On average one percent increase in geographic concentration increases exports of textile and clothing sector of Pakistan by 0.11 percent approximately but it is not significant. This indicates vulnerable position of textile sector of Pakistan as the import restriction policy of EU, USA and other major countries can restrict the exports of textile and clothing sector of Pakistan. In practice, we have seen despite quota abolition these countries have restrictive trade policies for the textile and clothing exports from the country like Pakistan in terms of tariff and other barriers. World real per capita income as one of the major demand determinants is indicating right positive and significant relation at 5% level of significance with export of textile and clothing sector of Pakistan. On average one percent increase in real world per capita income increases the exports by 0.86 percent of textile and clothing products of Pakistan. It has significant impact at 5% and 10% level of significance.

Since, this study revealed low comparative advantage of clothing sector of Pakistan and greater comparative advantage in textile sector. Due to this clothing sector has positive, weaker and insignificant impact on exports but textile sector has comparatively stronger and significant impact on the exports of textile and clothing sector. Both have right positive signs. One percent increase in comparative advantage in clothing sector increases exports by 0.08 percent and comparative advantage in textile sector increases exports by 0.64 percent on the average. Textile sector is playing significant role instead of clothing sector of Pakistan. Real effective exchange rate indicates that one percent increase in rate (i.e. depreciation in Pak Rupee) decreases exports by 0.88 percent. Because depreciation of currency makes, import of textile and clothing machineries expensive and increase the cost of production. Already, Pakistani products are more costly than its competitor's products; this reduces the profits and discourages exporters. On average one percent increase in real effective exchange rate decreases the exports by 0.91 percent.

When we introduce dummy variable to capture the impact of quota abolition in the model then long run results are somehow different. But dummy variable of covering the values 0 and 1 for the period from 1980 to 1994 (D=0) and from 1995 to 2011 (D=1) analyzes the impact on intercept. The results of long run coefficients are given in table 9.

**Table 9: Long-Run Coefficients (With Dummy)**

Dependent Variable = $LEXP_t$			
Variables	Coefficient	T-Statistic	Prob-value
Constant	1.276691	0.467825	0.6440
$LGC_t$	0.119410	0.337769	0.7384
$LWY_t$	0.868562	2.258821	0.0329
$LRCAC_t$	0.085166	1.132410	0.2682
$LRCAT_t$	0.645493	2.178367	0.0390
$LREER_t$	-0.889675	-2.221712	0.0356
Dummy	-0.000741	-0.019283	0.9848
R-squared = 0.982305			
Adj- R –Squared = 0.978058			
F-Statistic =231.3030			
Prob (F- Statistic) =0.000			
Durbin Watson =1.35			

Source: Author's calculation

Table 9 indicates insignificant impact of dummy as it is shown from dummy coefficient is statistically insignificant but showing negative impact. This means it will alter and reduce the value of intercept by 0.00074, but showing no impact of trade liberalization on export performance of textile and clothing sector of Pakistan.

#### 4.2.3 Short Run Dynamics

Once co-integration is confirmed among the variables, this study analyzes VECM to see short run relationship among variables. The results of short-run relationship are given in table 10.

**Table 10: Short- Run Relationship of the Model**

	$\Delta(LEXP)$	$\Delta(LGC)$	$\Delta(LGDP)$	$\Delta(LRCAC)$	$\Delta(LRACT)$	$\Delta(LREER)$
Constant	0.012918	-0.017665	0.01635	0.014684	-0.002763	0.002068
T-Stat	0.81275	-1.37827	1.63119*	0.77022	-0.22076	0.22130
ECT(-1)	-1.367922	0.105861	-0.020403	-0.130649	-0.132608	-0.049420
T-stat	-4.28952***	0.41166	-0.10141	-0.34155	-0.52804	-0.26353

Author's Calculation

Note: \*\*\*, \*\*, \* represents 1 %, 5% and 10% level of significance

The time path of co-integrating variables is affected by the degree of deviation from long run equilibrium (Enders, 2004). The ECT error correction term represents the correction of deviation in percentage term towards long run equilibrium. The sign of ECT(-1) as reported in table 10 shows correct negative sign and statistically significant at 1% level of

significance, indicating speed of convergence. This means any disturbance in long run equilibrium, will be corrected in every short run period by a 1.36 percent. This also shows that correction towards equilibrium will take place in almost nine months of a year i.e. (1/1.367922).

### 5. Diagnostic Tests

Diagnostic test are applied to check the problems in the model such as normality, serial correlation, heteroskedasticity etc. These results are given in table 11.

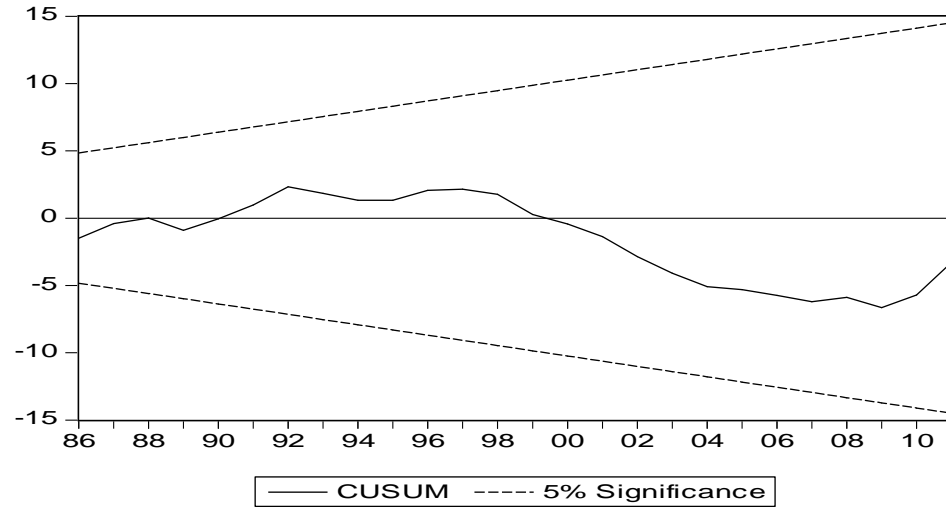
**Table 11: Diagnostic Tests**

<b>Normality Test</b> Jarque-Bera Statistic	Jarque-Bera Statistic = 0.986124	Prob=0.6107
<b>Serial Correlation</b> Breush-Godfrey LM Test	F-Statistic = 1.06293	Prob = 0.3611
<b>ARCH Test</b> Autoregressive Heteroskedasticity	F-Statistic = 0.571076	Prob = 0.5716
<b>Heteroskedasticity Test</b> White Heteroskedasticity	F-Statistic = 1.08294	Prob = 0.4621
<b>Model Specification Test</b> Ramsey Reset Test	F-statistic = 11.7027	Prob = 0.0003

Source Author's Calculation

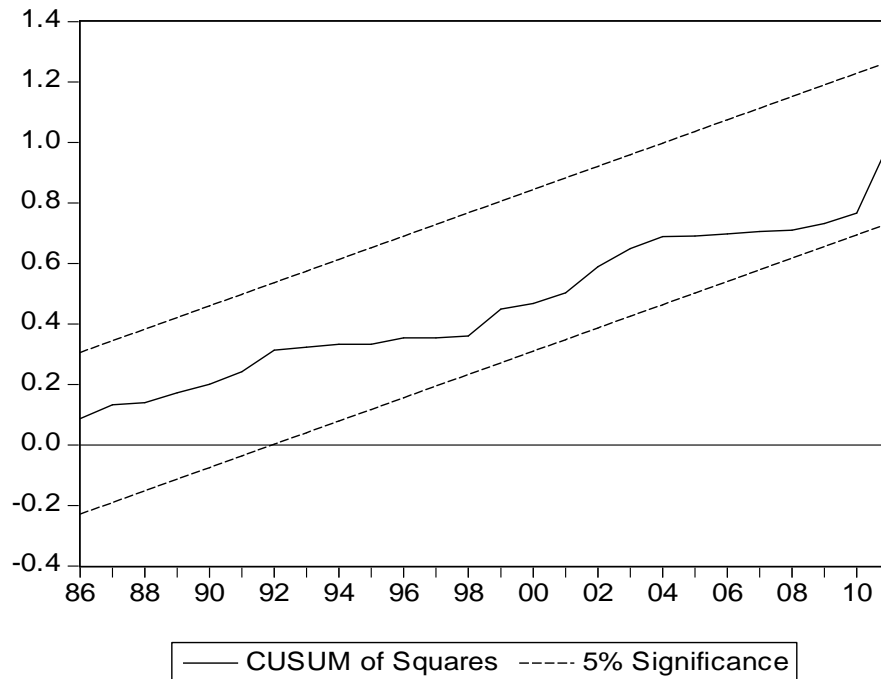
The results indicated in table 11 there is no problem of heteroskedasticity, serial correlation, and normality in our long run model. The test statistic from Jarque-Bera, Breush-Godfrey LM test, White heteroskedasticity and ARCH test have p-values greater than one indicating no problem in the model. This study also applies cumulative sum (CUSUM) and cumulative sum of squares (CUSUM SQUARE) to check the coefficient stability. The results of these statistics are reported below. The null hypothesis of correct specification of regression equation that should be with in boundaries at 5 % level of significance as shown in figure 1 and figure 2 cannot be rejected. Similarly plot of cusum and cusum square are also within critical boundaries at 5 % level of significance. Both graphs depict the correct specification of model.





The solid line shows critical boundaries at 5% level of significance

**Figure 1: Plot of Cumulative Sum of Recursive Residual**



The solid line shows critical boundaries at 5% level of significance

**Figure 2: Plot of Cumulative Sum of Square of Recursive Residual**

## 6. Conclusion and Policy Recommendation

In estimating the determinants of trade performance of textile and clothing revealed that real world per capita income, RCA of textile, and real effective exchange rate are

significantly affecting exports of textile and clothing sector of Pakistan. While geographic concentration and RCA of clothing sector, have insignificant but positive impact on the trade performance of textile and clothing sector. Though there may be several other factors which may have impact on trade performance but study captured few important determinants in the given data constraints and past literature.

Results also revealed that quota abolition did not improve the export performance as dummy of quota removal shows no significant impact on exports. There may be a plenty of reasons for not getting benefit from quota elimination, such as high input cost and higher prices of exports than competitors. Study also found the existence of co-integration in this model that confirms long run relationship among the variables of study. Finally this accepts our hypotheses that quota abolition did not increase exports of textile and clothing sector of Pakistan.

Therefore, present study suggests product diversification particularly focus should be made on other than cotton products to face competition; because Pakistan's comparative advantage in clothing sector is weaker and not playing significant role. The low comparative advantage in clothing sector of Pakistan requires special attention to garments, hosiery products by policy makers. Real Effective exchange rate indicates that depreciation of domestic currency should be applied as it increases exports. World income as a demand component indicates that Pakistan should search markets at the demand in international markets is available.

Dummy variable for capturing the effect of quota abolition found negative impact on export performance because EU and USA kept imposing high rates of tariff on Pakistani textile and clothing products. This has increased the prices of textile and clothing products of Pakistan in competitive markets but the prices of textile and clothing products of other countries such as Bangladesh and Vietnam did not increase due to absence of any trade restrictions. Therefore present study suggest reducing input costs to bring down the prices of final products which is only possible by increasing the growth of value added sector such as raw cotton, cotton yarn and raw exports must be limited to increase value added supply. This study also purpose to go for normalized revealed comparative advantage calculation to give better competitive picture on cross products and cross country comparison.

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