EXPLORING POTENTIAL AND OPPORTUNITIES FOR PAKISTAN'S COTTON EXPORT

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ABSTRACT:- Agriculture is the single largest shareholder to GDP and employment to labour force. It has major share in export but unfortunately unable to meet international standards. This study aims to analyze the pattern of Pakistan cotton export, and to explore sector's export potential and opportunities. This new research endeavor with well-tested analytical tools enabled the trade experts and policy makers to explore the answer of lackness for diversification in export, HS-2-digits aggregated data for cotton sub-sectors have been used with latest data from 2004 to 2013 for the panel of 39 countries. Revealed Comparative Advantage (RCA) index and gravity model approach was employed considering country and time specific fixed effect. The RCA index revealed that cotton sub-sectors have competitive advantage in export and there is gradual gain in the competitiveness with time. The opportunity exists in the markets of low, lower-middle and upper-middle income countries and countries those have fair trade (low tariff and non-tariff barriers) for cotton export. Greater export potential lies with Malaysia, Kenya, Jordan, Thailand, Mauritius, Netherlands, Norway, Australia and Russian Federation for export of cotton, however, export potential for cotton has been exhausted with Canada, France, India, Iran and Saudi Arabia. The study provide the policy information that countries of Latin America, Eastern Europe, Central Asia and Northern Africa are virgin for export. Therefore, Pakistan should penetrate in these markets for export of cotton and other agricultural products. Cognizant to new trade theories, Pakistan should focus on quality to gain maximum trade volume in the markets of high-income countries. Pakistan may develop trade agreement with ASEAN, SAFTA, and EU-27for export of agricultural products.

Key Words: Cotton; Export Potential; Opportunities; Comparative Advantage; Gravity Model; Pakistan.

INTRODUCTION

Pakistan occupied top position in global agricultural production. Agri-culture is vital to Pakistan's economy, employment opportunity and food security. This sector contri-butes nearly 21% to GDP, employs 45% of the country labour force and acts as a source of livelihood for 66% of the population living in rural areas. Pakistan has more than 30 mha of arable land and more than 50% (16 mha) of this land is cropped by wheat, cotton, sugarcane, rice and maize and it has the world's largest canal irrigation system, so due to these factors Pakistan has labour intensive and agro-based resource endowments those are not only crucial for economic growth but also contribute substan-tially in country's foreign exchange earnings through export. Agricultural sector depicts the country total

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exports (Figure 1). Cotton and cotton based products and food group dominate the total exports of the country by contributing 55% and 20%, respectively.

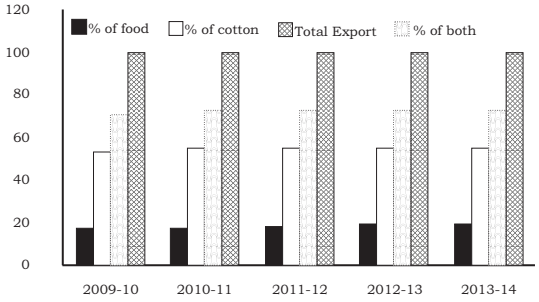

Figure 1. Role of agricultural sector in Pakistan's trade

Pakistan, having more agricultural land resources, is performing below in agricultural trade than Thailand and Malaysia and even Vietnam shows better figures as net exporter than Pakistan. Pakistan's trade is concentrated in few countries, namely, United States of America (USA), United Kingdom (UK), Japan, Germany, France, Spain, Saudi Arabia, United Arab Emirates (UAE), Thailand, Hong Kong and China. This specialization and sole dependence both in terms of commodities and countries severely put Pakistan's trade at risk. For instance the devastated flood of 2010 and 2011 not only reduced export of agricultural products in succeeding years, but also agricultural export were fluctuated due to geo-political and geo-economics ties with the trading countries.

The world merchandise trade volume expanded at large and more than half of this volume flows among the developed countries. Helpman (1999) explained the pattern of world trade. Bergstrand (1989) used difference of per capita GDP as factor of intra-industry trade using aggregated data for machinery sector. He revealed that differences in per capita income of the trading countries increases, trade between these countries decreases and vice versa. Hallak (2010) explained the impact of income dissimilarities between pair of countries on bilateral imports. Haq (2013) studied the role of income and income distribution in food and beverages products trade using SITC revision 3 at 04-digit level from1990 to 2000. He used income distribution as a determinant of pattern of trade by grouping the countries into low, lower-middle, upper-middle and higher income countries with importer, exporter, product and time fixed effect variables. He argued that income but not the income distribution is important determinant of the food and beverages product trade as the hypothesis that income does not influence food and beverages product trade was consistently rejected. He also showed that income elasticities across different countries grouped on per capita income level, were not same and also hypothesis of homothetic preferences was also rejected. Mitra and Trindade (2005) focused on the role of inequality in the determination of trade pattern and found that trade is driven by specialization in consumption and not production when countries are similar in all respect except asset inequality assuming non-homothetic preferences. Hallak (2004) postulated a direct relationship between quality of goods and income. His postulate was based on the evidence of both Recardian and factor proportion trade theories. Hallak (2010) further focused on product quality and showed that failure of the past studies confirming the Linder hypothesis was due to aggregation bias considering income distribution among countries. Krugman (1980) showed that transport cost play

role for varieties of differentiated products produced with economies of scale. In a model of two countries with one input (labour) and two sectors (one is homogeneous and one differentiated) he concluded that large countries would export differentiated products on net. Schmitt and Yu (2001) showed that "an increase in the degree of economies of scale raises the volume of intra-industry trade and the share of trade in total production in a model of monopolistic competition with traded and non-traded goods". This confirms the view that technological changes might have contributed to the high growth rate of trade observed during the post-war period. Greene (2013) analyzed US export potential of advanced technology goods to India along with 76 other trading countries. He used Heritage Foundation scores for countries trade openness in an augmented gravity model. The trade freedom index developed by Heritage Foundation represents measure of a country's tariff and non-tariff barriers. Said and Shelaby (2013) analyzed Egypt agricultural bilateral trade potential with Arab countries using gravity model approach. They used ratio of export plus import to GDP value as degree of openness for the total trade. They found that Bahrain, Somalia, United Arab Emirates (UAE), Oman, and Libya were the open economies for all goods while Somalia, Tunisia, Yemen, Mauritania , Morocco and Lebanon were the most open economies and potential markets for Egypt for agricultural goods.

Agricultural sector of Pakistan has been analyzed on aggregate level. This study covers only cotton sector, which comprises more than 50% of the total agricultural trade of Pakistan. This study also helped in providing some basic facts: Pakistan's agricultural trade diversi fied market, trade agreements benefits and its determinants of agricultural trade This study captures the impact of different factors that affect Pakistan's cotton exports using last ten years data and a panel of 39 countries analyzed trend in cotton subsector exports over time; explores potential and opportunities for cotton subsector and extends policy recommendations based on the findings of the study.

MATERIALS AND METHOD

This research aims to analyze Pakistan's cotton export and exploring from potential and opportunities for it. In this regard, cotton export data of Pakistan during 2004-13 have been used for its partner countries (with a panel of 39 countries).

Classical gravity model usually employee cross-sectional data to show trade effects and trade relationship for a particular time but cross-sectional data over time (panel data) produced more interesting information. In this particular case panel data not only inspect the unobservable trading partner individual effect but also captured the relevant relationship among variables over time as one can observe a huge fluctuation in export figures of Pakistan due to law and order situation, natural disasters, and policy issues etc. Therefore, data over the period of time shows clearer picture by adjusting these factors/ issues.

Setting panel of 39 countries has been used, though unbalanced regarding grouping of countries by per capita income (low, lower-middle, upper-middle, and high income countries). These 39 countries comprised

92% of Pakistan's cotton export as destination countries. Furthermore, these countries have no zero trade data in all 10 years for import of cotton sub-sectors from Pakistan. (Table 1)

Table 1. Panel of countries according to income group

Income Group	Countries (Share 92 % of the total Agri. export)			
Low (03)	Afghanistan	Bangladesh	Kenya	
Lower-middle(04)	Egypt	India	Philippines	Sri Lanka
Upper-middle (09)	China	Iran	Jordan	Malaysia
	Mauritius	Russian Federation	South Africa	Thailand
	Turkey			
High (23)	Australia	Bahrain	Belgium	Canada
	Denmark	France	Germany	Hong Kong
	Italy	Japan	Kuwait	Netherlands
	Norway	Oman	Qatar	Saudi
	Singapore	South Korea	Spain	Arabia
	UAE	United Kingdom	USA	Sweden

Three countries have been selected from low, 04 from lower middle, 09 from upper-middle-income and 23 from high-income countries group.

Some sources were accessed for data from time to time (Table 2). The data were collected in raw form and modified according to the demand of analysis. The nominal figures of GDP, export value and per capita income were adjusted using GDP deflator to get the real values and then transformed in natural logarithm etc.

Revealed Comparative Advantage (RCA)

Revealed Comparative Advantage (RCA) index was used to check the selected sub-sector possess comparative advantage and sectors gain or lose comparative advantage for export over time This was developed by Balassa (1965) as follows:

$$RCA^{i}_{k} = \frac{X^{i}_{k}/X_{i}}{X_{k}/X} \qquad (1)$$

where,

X^{i}_{k} = Country i export of good (sector) k

X^{i} = Country i total export

X_{k} = World total export of good (sector) k

X = World total export.

The value of RCA greater than 1 indicate that a particular good (sector) has comparative advantage and value less than 1 indicates that a particular good (sector) has disadvantage. RCA can be easily calculated for aggregated or disaggregated trade data. Several developments have been made to the RCA index due to its disadvantage but it is still used in trade research as a indicator for comparative advantage. A visible disadvantage is that RCA value is asymmetric means that it is unbounded for good (sector) having comparative advantage but has zero bound for good (sector) having com-parative disadvantage. One of the alternative solutions for this was normalization of the RCA index proposed by Laursen (2000) as follows:

$$NRCA^{i}_{k} = RCA^{i}_{k} - 1 / RCA^{i}_{k} + 1 \qquad (2)$$

The Normalized Revealed Comparative Advantage (NRCA) can be interpreted as the standard RCA measure except that NRCA has a critical value of 0 instead of 1, with -1 as lower bound and +1 as an upper bound and shows symmetry.

Table 2. Sources of data

Variables	Description	Source
Classical	Export value	International Trade Centre (Trade Map)
	GDP	World Bank (World Development Indicators)
	Population	World Bank (World Development Indicators)
	Per capita Income	World Bank (World Development Indicators)
	GDP Deflator	World Bank (World Development Indicators)
	Distance	CEPII
Augmented	RTAs	CEPII
	Common Boarder	CEPII
	Common Colony	CEPII
	Trade freedom	Heritage Foundation (Trade Freedom Index)
	Real Exchange rate	World Bank (World Development Indicators)
	Tariff	WITS-TRAINS

Gravity Model

Theoretical Foundation

Bilateral trade is well described by gravity equation empirically. The gravity model first used by Tinbergen (1962) based on the Newton's law of gravitational force as:

$$F_{ij} = GM_i^{\alpha} M_j^{\beta} / D_{ij}^{\gamma} \qquad (3)$$

where,

Fij = Volume of trade between two countries i and j,

Mi(j) = Relevant economic size (preferably GDP or GDP per capita) of country,

i(j) &

Dij = Distance between the two countries i and j.

Irrespective of the popularity of the gravity model to successfully analyze bilateral trade flows, the model was criticized for lacking strong theoretical foundation. Anderson (1979) was the first who gave a solid theoretical backup to the gravity model. He derived his model, using Cobb-Douglas type Constant Elasticity of Substitution (CES) utility function with properties of Linear Expenditure System (LES) as:

$$U_j = [\sum_i \sum_k \beta_{ik} M_{ijk}^{-p}]^{-1/p} \qquad (4)$$

This model was based on hypothesis--identical homothetic preferences and Armington assumption, i.e., products are differentiated or there is imperfect substitutability between traded goods by country of origin. It was concluded that the model derived was an alternative to cross-section budget studies and applicable where trade tax and transport cost structure are similar.

Krugman (1980) supported the gravity model with the assumption of increasing-return-to-scale.

Bergstrand (1985) backed the gravity model with theoretical foundation using reduced form as partial equilibrium sub-system of a general equilibrium. He used the nested CES utility function for demand of good k, in country j, exported by country i, equating by export (supply) of good k by country i to country j through profit maximization. He derived all this process as following:

Assuming that consumers in country j share the CES utility function of the type:

$$U_j = [\{(\sum_{\substack{k=1 \\ k \neq j}}^{N} X_{kj}^{\theta j})^{1/\theta j}\}^{\psi j} + X_{jj}^{\psi j}]^{1/\psi j} \qquad (5)$$

where,

X_{kj} = Quantity of aggregate imported/tradable goods

X_{jj} = Quantity of domestically produced/non-tradable goods demanded by country j's consumers $\psi_j = (\mu_j - 1/\mu_j)$ and

μ_j = CES non-tradable and tradable goods in country j like that

$$0 \leq \mu_j \leq \infty \quad \text{and} \quad \theta_j = \delta_j - 1/\delta_j$$

where,

δ_j = CES among importable/tradable in country j such that $0 \leq \delta_j \leq \infty$

The above utility function can be maximized subject to budget constraint of the type;

$$Y_j = \sum_{K=1}^{N} \bar{P}_{kj} X_{kj} \quad j = 1,.,\ldots N \qquad (6)$$

where,

$\bar{P} = P_{kj} T_{kj} C_{kj} / E_{kj}$

P_{kj} = Currency price of k good sold in country j's market,

T_{kj} = One plus the tariff rate with restriction

$T_{jj} = 1$,

C_{kj} = Transportation cost to ship product k from country i to country j with restriction

$C_{jj} = 1$,

E_{kj} = Spot value of j's currency in terms

of k's currency with E_{ij}=1.

He further explained that export of goods by country i to country j, firms maximize the profit function of the type:

$$\Pi_i = \sum_{k=1}^{N} P_{ik}X_{ik} - W_i R_i \quad i = 1,2 \cdots N \qquad (7)$$

where,

R = Amount of internationally immobile resources in a given year in country I (e.g., labour)

W_i=Country i currency value of a unit of R_i and R is allocated according to the constant-elasticity-of-transformation(CET) joint production surface of the type:

$$R_i = [\{(\sum_{k=1, k\neq 1}^{N} X_{ik}^{\theta_i})^{1/\theta_i}\}^{\delta i} + x_{ii}^{\delta i}]^{1/\delta i}, \; i = 1,2 \cdots \cdot N \quad (8)$$

where,

$\delta_i = (1+\eta_i)/\eta_i$

η_i = Country i's CET between production for home and foreign markets

$0 < \eta_i < \infty$ and $\Phi_j = 1 + \gamma_i/\gamma_i$

where,

γ_i = Country CET for production among export markets such that $0 \leq \gamma_i \leq \infty$

Bergstrand (1989) extended the microeconomic foundation of gravity model assuming that preferences are non-homothetic and countries differ in relative factors endowment.

Deardorff (1998) derived gravity model from the Hechscher-Ohlin trade model by assuming that products are not differentiated by the country of origin. In the first case he derived gravity model for free trade in homogeneous products and consumers in importing country and producers in producing country are indifferent in choice. In this first case he assumed that trade frictionless (with no role of distance) and preferences are homothetic.

$$T_{ij} = \frac{Y_i Y_j}{Y^w} \qquad (9)$$

In the second case Deardorff derived gravity model with impeded trade with product differentiation and CES or Cobb-Douglas preferences.

$$T_{ij} = \frac{Y_i Y_j}{Y^w} \frac{1}{t_{ij}} \left[\frac{p^{1-\delta}}{\sum_h \theta_h p^{1-\delta}}\right] \qquad (10)$$

From this equation Deardorff concluded that, the greater the elasticity of substitution among goods, the more trade between distant countries would fall of the gravity equation and the more trade between close countries. Anderson and van Wincoop (2003) recently derived a simple gravity equation from a general equilibrium model with CES preferences as:

$$X_{ij} = \frac{Y_i Y_j}{Y^w} \left(\frac{t_{ij}}{P_i P_j}\right)^{1-\delta} \qquad (11)$$

From the above model they argued that trade barriers reduce size-adjusted trade between large countries more than among small countries, trade barriers raise size-adjusted trade within small countries more than within large countries and trade barriers raise the ratio of size-adjusted trade within country 1 relative to size-adjusted trade between countries 1 and 2 by more the smaller is country1 and the larger is country 2.

Empirical Model

Following Greene (2013), the following empirical model was employed:

$$lnPCExp_{itj} = \alpha_o + \gamma_j + \beta_y + \alpha_1 lnDist + \alpha_2 lnPCIlowinc + \alpha_3 lnPCIlmid + \alpha_4 lnPClumid + \alpha_5 lnPCIhigh + \alpha_6 TrFreedom + \alpha_7 Border + \alpha_8 ComCol + \alpha_9 rta + \mu \qquad (12)$$

where,

All values are real adjusted with GDP deflator.

PCExp =Value of per capita cotton

export from Pakistan to country j in time t.

Dist =Distance of country j in km

PCIlowinc =Per capita income of low income countries

PCIlmid =Per capita income of lower-middle income countries

PCIumid =Per capita income of upper-middle income countries

PCIhigh =Per capita income of higher income countries

TrFreedom =Trade freedom index developed by Heritage foundation based on tariff and non-tariff barriers

Border =Dummy for bordering countries to Pakistan

ComCol =Dummy for countries remained member of common colonial system with Pakistan

rta = Dummy for trade agreement of Pakistan with j countries

α_o = Constant

β_y = Country j fixed effect

α_1 to α_9 = Time or year fixed effect

ln = Natural logarithm

= Parameters to be estimated

μ_i= Error term assumed to be iid with zero mean and constant variance.

Variable Defined

Distance

Distance means the geographical distance in kilometers between commercial capital of Pakistan (Karachi) to capitals or commercial capitals of the importing/partners countries (Frankel, 1997). Data on distance variable has been taken from CEPII website. Distance variable is the proxy for various trade and shipment cost that, change with distance changes. Most commonly cited trade costs are transportation and transaction costs including price of fuel, physical shipment and infrastructure. Distance acts as a trade barrier and the estimated coefficient is expected to negative and significant.

Per Capita Income (PCI)

Per capita income is a country's GDP divided by its population. It is commonly used as a proxy for standard of living of a specific country. The PCI has been split into low (PCI low), lower-middle (PCIlmid), upper-middle (PCIumid), and high (PCIhigh) countries to allow different income elasticities for these four groups of countries. Per capita income (PCI) is split by interacting PCI with dummy variables representing the level of economic development as

PCI low = PCI*Dl,
PCIlmid = PCI*Dlm,
PCIumid = PCI*Dum,
PCIhigh = PCI*Dh

where,

Dl, Dlm, Dum, and Dh *are the* Dummy variables representing the development level of importing countries such that

Dl = 1 for low income countries and 0 otherwise;

Dlm = 1 for lower-middle income countries and 0 otherwise;

Dum =1 for upper-middle income countries and 0 otherwise

Dh =1 for high income countries and 0 otherwise.

The estimated coefficient for per capita income is expected to be positive and significant.

Index of Trade Freedom

Trade Freedom is an index calcu-

lated by Heritage Foundation represents a composite measure of a country's tariff and non-tariff barriers. The index measures a country's degree of trade liberalization regime. The variable have a positive sign, meaning that country with higher value of the index to trade more due to freer trade policies. The trade freedom score for each country ranges between 0 and 100, and 100 equals to maximum freedom. The index qualification scores are free economies (> 79.9), mostly free economies (70.0 - 79.9), moderately free economies (60.0 - 69.9), mostly unfree economies (50.0 - 59.9), and repressed economies (< 50). This index reveals that Hong Kong and Singapore with score of 90.0 are the free trade countries while Iran with a score of 41.4 is the repressed economy followed by Bangladesh as unfree economy with a score of 59.0.

Boarder

A binary dummy variable including importing countries who share common border with Pakistan. Border variable is 1 for the countries also sharing common border with Pakistan, otherwise 0.

Common Colony

A dummy variable has been included for importing countries who have been remained under same colonial system. This dummy variable is equal to 1 if an importing country has been remained under same colonial system with Pakistan and 0 otherwise.

Regional Trade Agreements

Again a binary dummy variable equal to 1 if an importing country is a member of trade agreement with Pakistan otherwise equal to 0. These trade agreements include preferential trade agreements, free trade agreements and agreements for economic and trade cooperation.

RESULTS AND DISCUSSION

Descriptive Statistics

GDP and per capita income of high-income countries is high as compared to other three groups of countries based on per capita GDP, followed by upper-middle income countries (Table 3). These variables certainly act as a proxy for a country's standard of living and welfare. According to new trade theories countries those are more developed, more trade. Also these countries are assumed to be capital intensive and Pakistan being agricultural country with abundant water, land and labour force, is assumed to be labour intensive. So there is more export of agricultural commodities from Pakistan to these countries. The lower-middle and upper-middle income countries possess more population as compared to low and high-income countries. This implies

Table 3. Descriptive statistics of important variables

Variable	Mean	Minimum	Maximum
GDP of low income panel countries (billion USD)	79.03	20.10	161.80
GDP of low-middle-income panel countries (billion USD)	621.55	67.50	1875.20
GDP of upper-middle-income panel countries (billion USD)	1540.29	11.90	9469.10
GDP of high income panel countries (billion USD)	1917.91	32.80	16768.10
Population of low income panel countries (millions)	77.17	30.55	156.59
Population of lower-middle-income panel countries (millions)	363.27	20.48	1252.14
Population of upper-middle-income panel countries (millions)	201.21	1.26	1357.38
Population of high income panel countries (millions)	42.57	1.33	316.13
Per capita income of low income panel ? countries (USD)	978.56	657.90	1244.54
Per capita income of lower-middle-income panel countries (USD)	2716.48	1497.60	3307.48
Per capita income of upper-middle-income panel countries (USD)	8356.37	4910.44	14488.52
Per capita income of high income panel countries (USD)	48079.05	21197.85	102811.60
GDP deflator of the panel countries	3.14	-1.90	17.80
Distance of the panel countries (Kms)	4727.66	374.65	11091.54
Trade freedom index of the panel countries	79.56	41.40	90.00

that these groups of countries grasp markets for consumption of food and agricultural commodities. Fortunately, the leading populous countries like China and India are sharing border with Pakistan but simultaneously both the countries also clique more agricultural resources. So export prospects of agricultural commodities from Pakistan to these two populous countries are less encouraging an strong competition in rice and cotton exports. Distance variable, which is proxy for trade and shipment cost, was at minimum with 375 kmand at maximum with nearly 1200km. Trade and shipment cost increase as distance increase, therefore, hamper the trade (export). Beside shipment cost, tariff and non-tariff barriers are other important factors that affect trade. The trade freedom index, based on tariff and non-tariff barriers, was minimum 41.40 (Iran) and maximum 90 (Hong Kong and Singapore). As the index value increase, countries are freer to trade and vice versa, better export opportunities exist with countries that are freer to trade regardless of the shipment and transportation cost.

Empirical Estimates

Cotton is the most important sub-sector of Pakistan's agricultural sector. Cotton has 1.4% share in GDP and 6.7% in agricultural value addition and also is an important source of raw material for the textile industries of Pakistan. Pakistan is ranked fourth in terms of cotton production after China, India and USA and ranked third in respect of cotton consumption after China and India (GoP, 2013). Cotton shares about 50% in the total agricultural export, average, during the last 10 years. This sub-sector export stood at $3 billions in 2004 and reached $5.33 billions during 2013.

Pattern and Structure of Cotton Export

The pattern of cotton export by Pakistan is interesting. During 2004 2009, high-income countries have exceeded their segment than upper-middle income countries and the phenomenon was found reverse in the succeeding years (2010- 2013). A similar pattern was observed where lower middle income countries were exceeding their share in the pattern of cotton export than low income countries and the phenomenon was found opposite for the same period as mention for high and upper-middle income countries (Figure 2). This revealed that low-income countries demand for necessities increased

Table 4. Structure of cotton export (HS-52)

HS-4 Code	Product Label	Value (million USD) 2009	2010	2011	2012	2013
5205	Cotton yarn (not sewing thread) 85% or more cotton, not retail	1288.03	1628.69	1954.69	2102.66	2205.41
5209	Woven cotton fabrics, 85% or more cotton, weight over 200 g/m2	539.57	707.92	928.72	1087.56	1210.16
5208	Woven cotton fabrics, 85% or more weight less than 200 g/m2	537.98	668.59	789.91	728.09	746.71
5210	Woven cotton fabrics, less than 85% cotton, mixed with manmade fibers, w	362.19	409.14	524.99	491.23	503.74
5201	Cotton, not carded or combed	171.58	216.75	359.35	373.08	217.16
5211	Woven fab of cotton, less than 85%, mixed with man made fiber, weight >200	69.81	85.69	141.18	80.28	112.00
5212	Woven fabrics of cotton, nes	170.51	200.36	258.35	215.64	208.93
5202	Cotton waste (including yarn waste and garneted stock)	29.37	35.77	65.71	89.93	79.54
5206	Cotton yarn (not sewing thread) less than 85% cotton, not retail	9.22	21.87	44.59	33.05	22.11
5204	Cotton sewing thread	6.36	4.06	5.09	19.17	10.79
5203	Cotton, carded or combed	18.55	32.13	20.91	4.35	15.78
5207	Cotton yarn (not sewing thread) put up for retail sale	0.62	2.47	3.64	0.68	1.45
	Total	**3203.79**	**4013.42**	**5097.13**	**5225.69**	**5333.78**

than lower-income and upper-middle income countries. Demand for this commodity has increased against high-income countries for the last five years. Cotton yarn, woven cotton fabrics with more than 85 % cotton, cotton not carded or combed and woven fabrics with less than 85% cotton comprised the major structure of cotton exports by Pakistan(Table 4).

RCA and NRCA for cotton

Estimates of revealed and normalized comparatives advantages illustrated that this sub-sector has pronounced export competitiveness (Table 5). The RCA value gained a gradual increase from 2004 to 2008 from 45.59 to 58.08, respectively but decreased in 2009 and 2010 and it again reached at its maximum (63.39) in 2012. All this depicted that cotton sub-sector has consistent export competitiveness in the world market for foreign exchange earnings.

Table 5. Revealed comparative advantage for cotton over the period 2004 to 2013

Year	World Export(Total)	World Export (Cotton)	Pak Export (Total)	Pak Export (Cotton)	RCA	NRCA
2004	9377673.61	45794.05	13379.02	2978.801	45.594	0.957
2005	10610548.23	43876.59	16050.20	3428.951	51.664	0.962
2006	12239366.14	45962.85	16932.87	3601.009	56.630	0.965
2007	14090086.67	47254.98	17838.41	3439.578	57.493	0.966
2008	16327839.00	49849.80	20279.05	3595.598	58.075	0.966
2009	12584107.19	39710.42	17554.70	3203.792	57.835	0.966
2010	15286355.73	53751.16	21413.10	4013.419	53.303	0.963
2011	18270543.69	68389.61	25343.77	5097.133	53.730	0.963
2012	18274654.38	61209.15	24613.68	5225.694	63.387	0.969
2013	9377673.61	45794.05	13379.02	2978.801	45.594	0.957

Exploring Export Opportunities for Cotton

Estimates of the gravity model, illustrates that export opportunities exist for cotton in the countries having high trade freedom index, that means there is numerous opportunities for export of cotton to the countries that impose minimal or zero tariff and non-tariff barriers (Table 6). Furthermore, abundant export opportunities exist for cotton in low, lower-middle and upper-middle income countries. As per capita income of low, lower-middle,and upper-middle income coun-tries increased by 1% per capita export of cotton increase by 1.0%, 1.1% and 1.2%, respectively. Elasticities are unitary elastic across these three income groups as revealed by test of hypothesis (Table 7). No export opportunities exist for cotton in countries of high-income group on aggregate. Haq (2013), while analyzing the impact of income on food and beverages trade, found that except meat, the results for the other commodities across the development spectrum are divergent and consistent. Results are divergent because the elasticities of high- and lower-income countries are statistically inelastic

Table 6. Gravity model estimates for cotton

Variable	Coefficient	St. Error	t-statistics
Log of distance	1.168	1.049	1.11
Common Border	1.602	1.568	1.02
Common Colony	2.57	1.821	1.41
RATs	2.449	2.798	0.88
Trade Freedom	0.670***	0.254	2.64
Income elasticity of			
Lower income countries	1.086***	0.337	3.22
Lower middle countries	1.007***	0.194	5.2
Upper middle countries	1.247***	0.218	5.7
Higher income countries	0.006	0.207	0.03
Fixed Effect			
Countries/importers	F- stat. (34,337)		195.41***
Time/Year	F- stat. (9, 337)		
Summary statistics			
No. of observations	390		
R^2	0.95		
F-statistics	199.75***		

**** Significant at 0.01 level, respectively Standard errors are heteroscedasticity consistent*

Table 7. Test of hypothesis for cotton

Hypothesis		F-value
H_o:	Elasticities are the same across the development spectrum	12.09**
H_o:	Elasticities are jointly zero	15.20**
H_o:	Preferences are homothetic for Lower income countries	0.07
H_o:	Preferences are homothetic for lower-middle-income countries	0.00
H_o:	Preferences are homothetic for upper-middle-income countries	1.28
H_o:	Preferences are homothetic for higher income countries	22.93**

**** Variables are statistically significant at 0.05 level.*

while lower and upper middle income (collectively middle-income) countries of elasticities are statistically elastic except dairy products and tea, coffee and mat'e lower-middle income countries. Results are consistent because these hold for all the product imports. Interestingly lower and upper-middle income countries have statistically elastic income elasticities for different groups of products. So, lower-middle income countries have statistically elastic income elasticity for fresh fish and upper-middle for frozen fish, lower-middle for fresh fruit and upper-middle income countries for processed fruit. In addition, upper-middle income countries have statistically income elasticities for cereals and vegetables.

Though distance variable is statistically insignificant but carries positive sign against prior expectations. While border and RTA variables are insignificant. India and China are the border sharing countries with Pakistan and also having trade agreements and both are the top ranked cotton consuming countries as well as cotton producing countries, might be the probable reason for no propitious outcomes in respect of cotton. The existing work does not provide concrete conclusion on the welfare effect of RTAs both for participating countries at large. Studies that decompose the trade effect of RTAs into trade creation or trade diversion gave divergent results. Lambert and McKoy (2009) found a positive impact of preferential trade associations on intra-bloc trade in both agricultural and food sectors. Urata and Okabe (2007) concluded that FTAs bring about trade creation this effect and trade diversion effect is limited. Haq (2013) also found positive impact of trade agreements on agricultural food imports while, Hallak (2004) found a negative sign for PTA 19 times, two of which were statistically significant. In the same study, the author founda negative sign for a common border 11 times.

The high values for R2 (0.95) and F-statistics (199.75) indicated a good fit of the model and the included variables are responsible for 95% variation in dependent variable. Time and country specific fixed effects were also found statistically significant.

Exploring Potential Markets for Cotton

Estimates of export potential of cotton sub-sector for individual markets have been pre-arranged. Malaysia, Kenya, Jordan, Thailand, Mauritius, Netherlands, Norway, Australia and Russian Federation are the potential markets for the export of cotton (Table 8). Highest export potential exist with Malaysia and Jordan as potential to actual export ratio were much greater than unity for these countries. However, export potential for cotton has been whacked with Canada, France, India, Iran

Table 8. Export potential for cotton

Country	Trade Potential	Country	Trade Potential
Afghanistan	1.047*	Mauritius	1.332***
Australia	1.108***	Netherlands	1.432***
Bahrain	1.012*	Norway	1.262***
Bangladesh	1.019*	Oman	1.019*
Belgium	1.024*	Philippines	0.954*
Canada	0.528**	Qatar	1.022*
China	1.018*	Russian Federation	1.268***
Denmark	1.035*	Saudi Arabia	0.322**
Egypt	1.056*	Singapore	1.046*
France	0.459**	South Africa	1.013*
Germany	1.031*	South Korea	1.011*
Hong Kong	1.011*	Spain	1.005*
India	0.556**	Sri Lanka	1.004*
Iran	0.369**	Sweden	1.147*
Italy	1.010*	Thailand	1.947***
Japan	1.018*	Turkey	1.009*
Jordan	2.477***	UAE	1.078*
Kenya	1.432***	United Kingdom	1.021*
Kuwait	1.023*	USA	1.032*
Malaysia	6.479**		

** No potential*
*** Potential echausted*
**** Potential exist*

and Saudi Arabia as potential to actual export ratio was less than unity. Actual export of cotton equals potential with rest of the panel countries.

CONCLUSIONS AND RECOMMENDATIONS

Nevertheless agricultural sector of Pakistan has an impressive picture globally, occupies 2nd to 15th ranks in production of different agricultural commodities, but due to structural and operational weaknesses does not perform up to the mark. Agricultural sector fulfill the food and fiber requirements of the growing population of the country but also contribute nearly one-fifth to the country's GDP, employs nearly half of the country's labour force, and earns foreign exchange too. Owoing the fact of natural disasters, agricultural sector of Pakistan still perform far below the developed economies and even developing economies, though having four seasons, one of the best irrigation system and abundant land and labour resources.

Agricultural sector not only act as a linchpin to the domestic economy but shares largely in the export structure of the country. The exports structure and pattern of Pakistan is specialized and export of Pakistan concentrate on few commodities and also on few markets. Cotton and rice are the two main export commodit ies and export concentrates on 8-10 countries, mainly developed economies.

The preceding results of this study conclude that cotton subsector of Pakistan not only has tremendous export competitiveness but also gained the advantage over time. Based on these findings it can also be concluded that numerous export opportunities exist in low lower-middle and upper-middle income countries for the export of cotton subsector. The developing economies grow not only economically at faster rate than developed economies but also their consumption appetite is increasing. Furthermore, trade agreements signed by Pakistan did not show encouraging results for trade (export) creation. On the other hand countries, which are freer to trade, provided favorable results.

All this concludes that Pakistan should focus on diversification of cotton export in terms of market. Pakistan should fetch the opportunity of exporting cotton to developing and less developed countries. Concentration on few markets like, USA, UK, Germany, Japan, Saudi Arabia, UAE and Hong Kong is less beneficial and risky. Diversification of trade (export) in terms of market has been empirically proved by this study; therefore, revival of trade policy regarding diversification in terms of markets is vital. Upper-middle income countries possess great potential and opportunities for importing cotton from Pakistan. Pakistan must avail this opportunity. This will also avert risk, as trade with developed countries links with political factors.The impact of RTAs was not encouraging, therefore, until and unless transport and infrastructure facilities are not improved trade with countries having RTAs with Pakistan cannot be boosted as RTAs exists within region mostly or bordering countries (China, SAPTA, Sri Lanka). Also Pakistan should engage in trade agreements with ASEAN, SAFTA, and EU-27.Product differentiation and quality aspect is another sensitive area.

(The new trade theories proved that countries with high-income export/ import quality product). Pakistan should focus on quality to gain maximum trade volume.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2.	Dr. Abdul Saboor	Conceived the idea, Methodology
3.	Dr. Zahoor-ul-Haq	Wrote abstract, Conclusion, Technical Input at every step
4.	Mr. Sultan Ali Tariq	Wrote abstract, Overall management of the article, Data collection, Data entry in STATA, Introduction, References
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