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Performance of India's cotton based textile trade: A constant market share analysis

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Abstract : The present study explores the impact of the opening up of the trade by analysing the instability, diversification of exports and decomposition of the export growth of cotton based textile items into different constituents using constant market share (CMS) analysis. The results showed that there is an increase in the instability of cotton based exports. The market share for raw cotton as well as apparel exports has shown a consistent growth, while a deceleration in the share of cotton textile export is witnessed. The constant market share analysis indicated that the market size effect play a vital role in the export growth supplemented by competition effect. The opening of the markets has increased greater access to the world textile market and by improving and revitalising the capacity of processing sector a great leap can be attained in the sphere of the cotton based textile exports ensuring greater benefit to the stakeholders in the cotton value chain.

Key words : Concentration index, constant market share, cotton textiles, instability, market share

India's textiles and clothing industry is one of the mainstays of the national economy contributing to 4 per cent of the GDP, 14 per cent of industrial production and employs around 35 million people. It is also one of the largest contributing sectors to the India's exports worldwide accounting for nearly 12 per cent of the share in the total export basket. Cotton accounts for more than 75 per cent of the total fibre consumption in the spinning mills and around 54 per cent of the total fibre consumption in the textile sector. Indian textile export basket comprises readymade garments, cotton textiles, handloom textiles, man made fibre textiles, silk, jute, etc. Readymade garments export (cotton based readymade garment export account for 72 per cent of total readymade garment exports) alone account for almost 40 per cent of the total textile exports and along with the cotton textiles (Yarn and fabric), contribute nearly 70 per cent of the total textile exports.

The trade in textiles, governed by restrictive trade practices such as export restraint from the developed countries were codified into numerous multilateral agreements that finally culminated into the Multi-Fibre Agreement (MFA) in 1974. Under the MFA regime, the trade in textiles were restricted not only against specific fibres and products, but also among exporting nations, which pose a threat of market disruption to the importing nation (Chaudhary, 2008). These barriers were the major constraining factors in the developing countries, which possessed a competitive advantage in the production of textile products. Agreement on Textiles and Clothing (ATC) was designed to replace the MFA and phase out the quota based restrictions on a time bound manner in a period of ten years (1995-2005). This is a transition policy, which facilitated lowering of the tariffs on textiles and clothing items and brings all trade policies with respect to the textile trade in line with the World Trade Organisation (WTO) guidelines.

The present paper explores into the impact of the changing regime in the trade of cotton and its value added products and assesses the trade performance of the textiles exports and elucidate on the different factors that have contributed to the growth in the exports using the constant market share analysis.

MATERIALS AND METHODS

The data for the present study includes the export of textile items to major countries and also individual textile items (cotton, yarn and fabric) to major destinations for the period 1999-2010. The data was collected from the Official Textile Statistics, published from the Office of Textile Commissioner, Ministry of Textiles. The exports of cotton, cotton yarn, fabric and apparels

(knit and woven) from India to major trading partners, along with the imports of the specified commodity by the trade partner from all other countries, was obtained from the United Nations Commodity Trade Statistics (UN COMTRADE). The data span is for a period of 2001 to 2011 such that two periods, ATC and the quota free trade regime were accounted for the analysis.

To assess the growth rate and the instability of the exports of all the textile items under different trade regimes the compound annual growth rate (CAGR) and Cuddy Della Valle index (CDVI) were employed. The concentration of the exports of the cotton and its value added products were analysed using the Herfindahl Hirshmann Index (HHI). The performance of trade was assessed using market share index.

The sources of growth of the exports was decomposed using the constant market share analysis into three different components namely market size effect, market composition effect and competition effect. The traditional CMS model was first applied to the study of international trade by Tyszynski (1951), the international competitiveness using CMS approach is a widely studied area in agriculture trade. The similar approach of CMS model was applied to decompose the export growth in the Indian textile trade. A discrete two time period model of Constant Market Share analysis is presented below

$\text{“}q = (S^0\text{”}Q) + (\acute{O}_i\ s_i^{0}\text{”}Q_i - S^{0}\text{”}Q) + (\acute{O}_i\ \text{“}s_iQ_i^{1})$ = Import growth effect + market effect + competitive effect

Where i = 1,..., I - Subscript for import market I

0 Superscript indicating the base period

1 Superscript indicating the end of the observation period

“ Change in a variable between two periods

q Export from the country A

Q_i^1 Import in market i from all countries during current period

s_i^0 Market share in imports of market I during the base period

Q Import from all countries to market I

S^0 Market share of all market during the base period

RESULTS AND DISCUSSION

Cotton production has undergone a significant change with the introduction of the *Bt* cotton (2002-2003) which has increased the productivity. Along with increased productivity, the area under cotton has witnessed an increase in the recent past adding to the higher cotton production in the country. The production of the spun yarn has increased from 2,485 to 6,263 million kg of which around 60 per cent is contributed by cotton yarn, while the output of cloth has attained the level of 61,761 million square meter with half the share coming from cotton cloth (Official Textile Statistics, 2010-2011). The improved production capacity in the processing sector could not keep pace with the increased supply of cotton and hence surplus cotton was available for exports as well. This has shifted India's status from a net importer of cotton to the largest exporter of cotton.

The overall textile exports has grown at a annual compound growth rate of 10 per cent since 90's while that of the overall exports has grown at the rate of 17.5 per cent/annum. Though there is continual increase in the export of textile items over the period, its share has come down to around 12 per cent in 2010-2011 from around 29 per cent in 1992-1993. The textile import has a meagre share in the overall imports of India accounting for around one per cent. The share of cotton based imports is less that 10 per

Table 1. Compound annual growth rate of total textile exports and it constituents

Category	Decadal growth rate of textile exports						
	Total textile exports			Cotton based textiles		MMF[1] textiles	
	Decadal growth	Period I 2001-2004	Period II 2005-2010	Period I 2001-2004	Period II 2005-2010	Period I 2001-2004	Period II 2005-2010
Fibre	40.41	24.06	62.91	41.08	88.94	15.57	28.92
Yarn	5.63	4.37	7.16	0.90	6.24	10.79	12.82
Fabric	7.89	7.10	9.71	0.26	3.52	18.42	17.78
RMG[2]	8.53	6.14	11.46	7.11	9.71	-3.93	13.39
Made ups	7.51	9.11	5.62	7.75	3.01	1.83	29.02

[1]Manmade fibre; [2] Readymade garments

Table 2. Instability in the textile exports under different trade regime

Textile item	ATC period (1995-2004) CDVI*	Free trade period (2005-2011) CDVI*
Cotton textiles	6.5	16.6
Cotton	110.0	44.3
Cotton yarn and fabric	6.4	11.7
Manmade(MM) textiles	13.4	8.7
MM fibre	28.9	13.0
MM yarn and fabric	13.5	8.8
RMG	6.0	7.3
RMG cotton	5.7	7.8
RMG MM	22.9	11.8

*Cuddy Della Valle Index

cent of the total textile imports. The compound annual growth rate of textile exports and its constituent's, cotton based and man made fibre based exports, are reported in the Table 1. It reveals clearly that there is an increase in the growth rate of exports in the period II (2005-2010) signifying the fact that the removal of quotas has improved the trade performance in consonance with the expectations that the end of MFA quota is likely to result in significantly faster growth in India's exports of cotton-based textiles and apparel (Vollrath *el al.*, 2005). The growth of cotton based exports during the first period is slackening which has improved during the quota free trade regime. In case of the man made fibre based textile exports the growth has been consistent in both the periods and lower price of the man-made fibre especially polyester has boosted its consumption in the textile industry.

Instability and concentration of textile exports : The instability in the export of textile

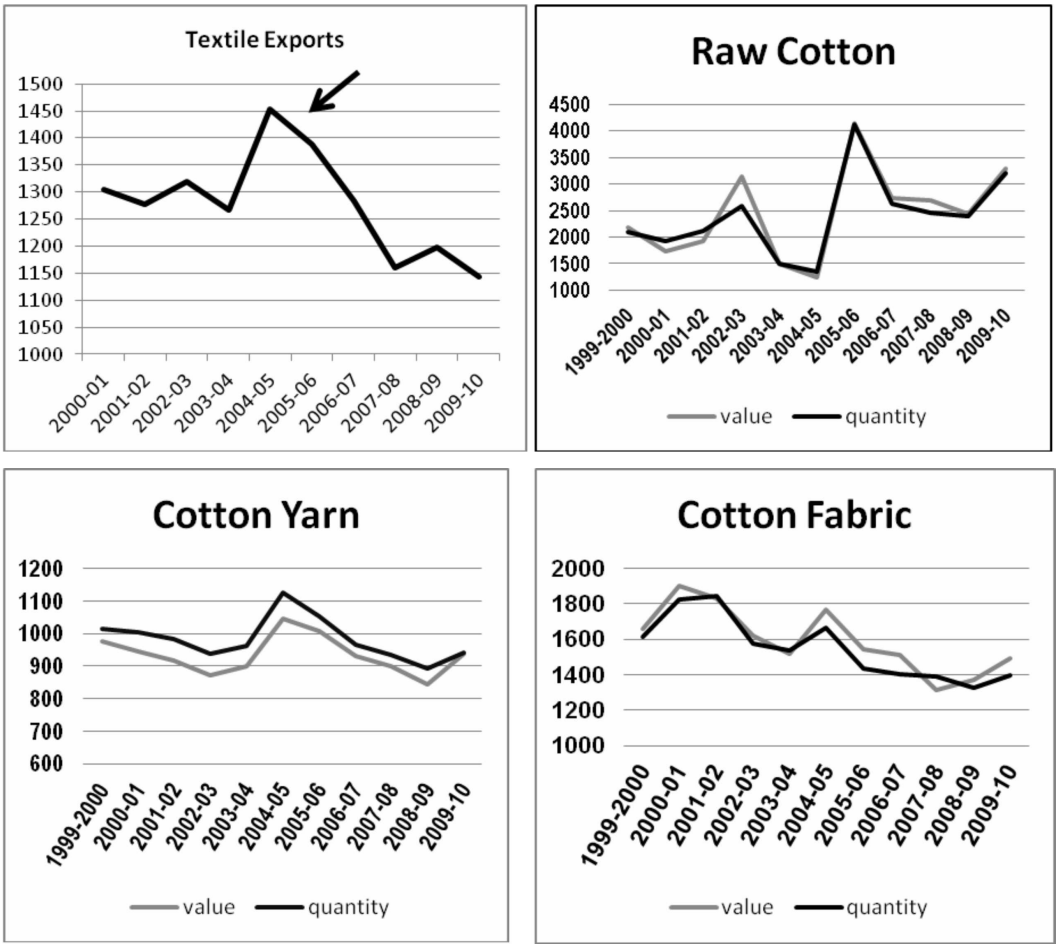

Fig 1. Degree of Concentration of Textile Exports – Herfindahl Hirshmann Index

Table 3. Market Share Index for textile items to major export destination

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	**Mean Period I (2001-2005)**	**Mean Period II (2006-2010)**
Trade in raw cotton												
China	0.0	0.0	1.0	1.1	5.1	10.8	19.8	16.3	19.3	23.8	**1.4**	**18.0**
Pakistan	-	-	0.7	6.8	6.4	19.5	26.2	20.4	21.2	28.3	**4.6**	**23.1**
Bangladesh	0.0	0.0	2.3	4.9	4.3	5.2	4.2	35.1	24.6	29.6	**2.3**	**19.7**
Indonesia	0.0	0.0	0.5	2.0	2.5	7.3	8.9	8.3	6.0	9.3	**1.0**	**8.0**
Turkey	0.0	0.0	0.1	0.0	0.4	2.3	8.1	2.4	3.7	4.0	**0.1**	**4.1**
Vietnam	0.1	0.0	1.4	1.2	6.6	14.4	14.9	10.8	8.6	18.1	**1.9**	**13.4**
Hong Kong	0.0	0.0	0.2	3.2	9.1	25.0	26.9	17.5	33.2	29.9	**2.5**	**26.5**
Trade in cotton yarn												
Rep. of Korea	17.8	23.1	25.6	27.0	29.4	26.5	24.3	20.4	21.2	25.6	**24.6**	**23.6**
Bangladesh	-	39.0	39.3	49.1	50.1	54.5	50.6	35.9	31.5	38.2	**44.4**	**42.1**
China	5.2	4.1	3.5	4.5	3.7	5.0	3.4	4.4	4.3	9.2	**4.2**	**5.3**
Turkey	8.7	12.6	13.0	14.6	13.5	11.1	24.2	16.0	10.7	16.5	**12.5**	**15.7**
Egypt	-	-	-	-	-	-	-	28.5	23.8	36.0	**-**	**29.4**
Brazil	9.5	13.2	8.9	11.3	24.7	24.8	28.1	38.7	36.8	39.6	**13.5**	**33.6**
Peru	19.3	15.5	2.7	19.7	25.5	29.3	40.9	40.2	42.2	42.2	**16.5**	**39.0**
Columbia	-	30.4	16.3	16.9	12.1	20.0	20.2	27.7	34.0	34.9	**18.9**	**27.4**
Portugal	6.9	8.5	6.9	7.3	12.1	15.2	19.1	17.9	17.2	24.5	**8.3**	**18.8**
Italy	12.6	13.9	13.4	15.0	20.6	18.3	17.7	15.8	13.6	13.4	**15.1**	**15.8**
Trade in cotton fabric												
Srilanka	10.3	13.0	13.7	12.4	12.6	14.5	17.0	23.7	27.6	29.2	**12.4**	**22.4**
Bangladesh	14.4	14.9	22.3	15.7	12.5	13.2	5.6	31.8	22.1	19.1	**16.0**	**18.4**
UAE	-	-	-	-	-	-	37.5	43.5	24.0	25.7	**-**	**32.7**
Saudi Arabia	19.7	17.4	21.0	32.2	31.8	50.6	41.7	99.1	98.4	43.2	**24.4**	**66.6**
Turkey	5.1	2.9	3.1	3.6	4.4	3.8	4.7	4.4	4.6	3.3	**3.8**	**4.2**
Senegal	33.0	37.1	28.1	26.5	41.2	64.6	67.2	69.4	74.4	82.1	**33.2**	**71.5**
USA	4.8	5.7	5.7	4.5	4.9	5.3	4.9	5.1	5.3	5.3	**5.1**	**5.2**
Italy	6.6	5.7	5.1	4.6	3.9	4.3	4.1	3.2	4.2	5.0	**5.2**	**4.2**
Trade in knitted fabric												
UAE	-	-	-	-	21.4	-	20.2	22.7	13.5	15.4	**21.4**	**18.0**
France	2.6	3.0	3.0	3.0	3.3	3.5	3.6	3.4	3.9	2.8	**3.0**	**3.4**
Germany	1.8	2.8	2.8	2.2	3.4	2.9	3.4	3.0	5.1	3.0	**2.6**	**3.5**
Italy	2.1	2.4	2.7	2.8	3.4	3.6	3.3	3.0	3.4	2.6	**2.7**	**3.2**
UK	2.8	3.2	2.9	2.8	3.6	3.3	4.0	3.5	6.6	3.9	**3.1**	**4.3**
USA	1.5	1.6	1.5	1.6	2.4	2.9	2.9	3.0	3.3	3.2	**1.7**	**3.1**
Canada	7.2	8.0	7.1	6.8	5.3	5.1	4.1	3.7	3.9	3.0	**6.9**	**4.0**
Trade in knitted fabric												
UAE	-	-	-	-	25.0	-	24.2	27.3	21.3	18.9	**25.0**	**22.9**
Saudi Arabia	11.8	12.4	12.8	11.9	11.0	10.4	9.8	20.6	24.2	9.3	**12.0**	**14.9**
Canada	4.9	5.1	4.3	3.5	4.1	3.9	3.0	3.1	3.3	2.8	**4.4**	**3.2**
USA	3.3	3.5	3.3	3.3	4.5	4.4	4.0	4.0	4.5	4.0	**3.6**	**4.2**
Italy	2.6	2.3	1.7	2.2	2.9	3.0	2.3	2.2	2.3	2.4	**2.3**	**2.4**
France	3.2	3.1	2.7	2.8	3.6	4.0	3.2	3.2	3.7	3.4	**3.1**	**3.5**
Germany	1.9	2.0	1.7	1.6	2.0	2.3	2.1	2.3	3.1	3.2	**1.8**	**2.6**
UK	3.4	3.4	2.9	3.3	5.1	4.9	5.2	5.5	6.3	6.4	**3.6**	**5.7**
Spain	2.2	2.7	2.9	2.7	4.3	3.5	2.8	3.6	5.2	4.5	**3.0**	**3.9**

items were worked out using Cuddy Della Valle instability (CDVI) index and results are presented in Table 2. The analysis of instability shows that the instability in the cotton based exports increased in the period of quota free trade regime while the instability of man made fibre based textile exports decreased. This can be attributed to the fact that man made fibre based exports from India are miniscule and India's exports are pre dominantly cotton based and hence we can see a decline in the stability of man made fibre based exports and increase in the instability of cotton textile based exports with the removal of quota free trade regime. The share of cotton in world apparel fibre consumption had declined from 36.3 per cent in 2007 to 32.9 per cent in 2010 (FAO and ICAC, 2013). The instability of raw cotton exports has declined during the free trade period mainly due to the higher production levels and consistency as well as concentration in exports.

The degree of concentration of textile exports was measured using the Herfindahl Hirshmann Index (HHI) (Fig 1). The higher the value of the HHI, higher is the degree of concentration of the commodity. Except for raw cotton, other major textiles exports showed a declining HHI, indicating diversification in the exports. The textile exports as well as the cotton yarn and fabric are showing a tendency towards

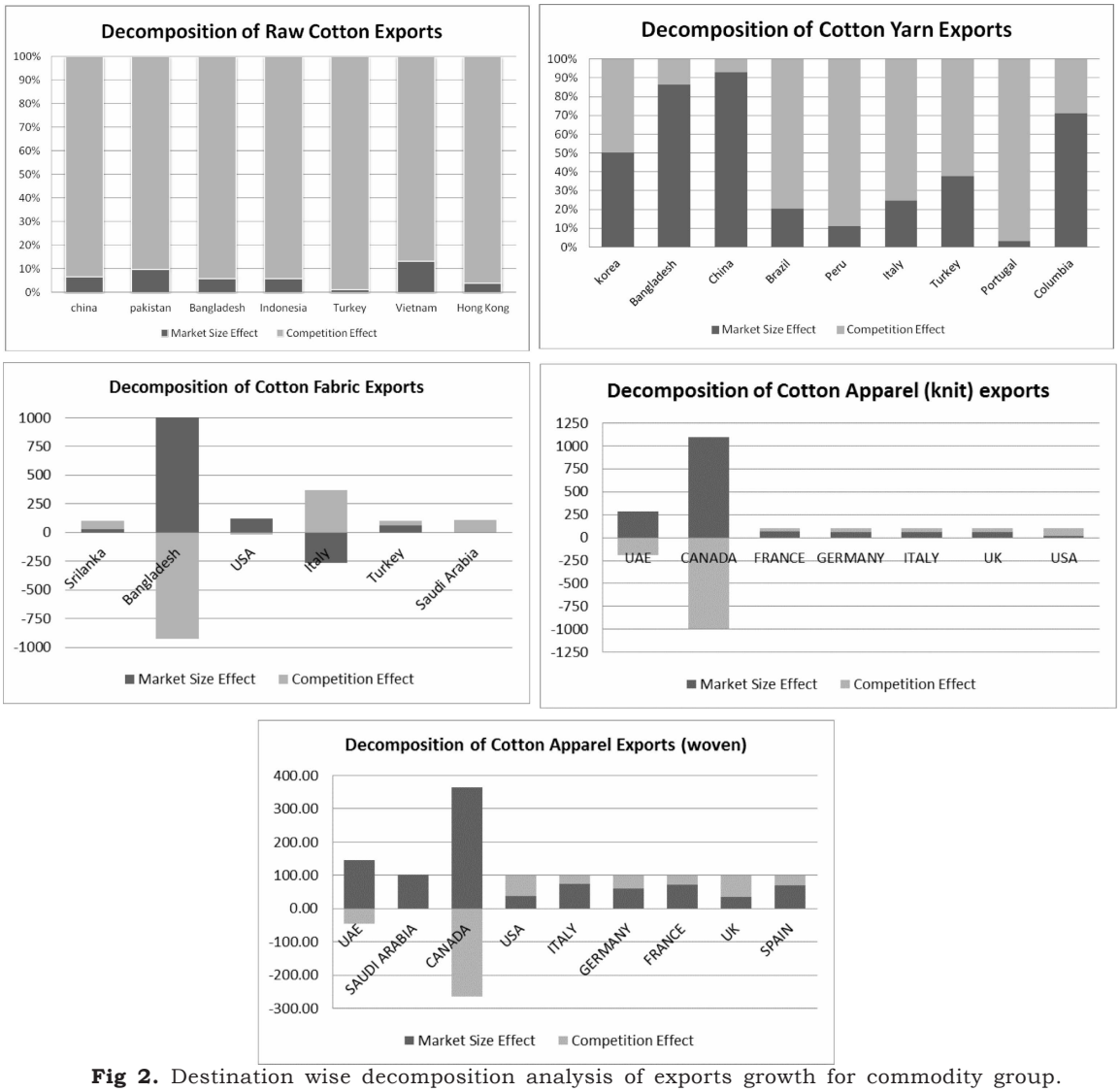

Fig 2. Destination wise decomposition analysis of exports growth for commodity group.

concentration during the period 2005, which reveals that the exports were targeted especially to those destinations (EU and America) which have relaxed the quota during the period. The raw cotton exports were increasingly concentrated towards the Asian markets, especially China, Pakistan and Bangladesh which accounted for more that 85 per cent of total raw cotton exports from India.

Performance of textile trade : The export performance of cotton based textile items measured using the market share index is presented in the Table 3. The destinations that account for major share in the export of the particular category were considered for the analysis.

The market share index for the raw cotton revealed that India accounts for around one third of the total imports of China, Pakistan and Bangladesh. Vietnam and Hong Kong are the other markets where considerable presence of India's cotton exports can be seen. Another noticeable feature of the raw cotton exports is that there was a great spurt in exports in the recent period while it had no significant contributions in these countries' import during early year of this decade. The improved performance of trade in raw cotton can be attributed to the increase in the domestic production of cotton that could create a surplus after meeting the increased domestic consumption by the textile mills. Major import hub for cotton yarn is the markets in Asia. The market share index revealed a significant presence of India's cotton yarn exports in major yarn importing nations, *viz.,* Republic of Korea and Bangladesh. The market share index showed that Indian cotton yarn exports has made inroads into the South American markets which now account for around 40 per cent of their respective market share. In case of cotton yarn exports to Europe mixed trends are visible as the market share increased in case of Portugal and Turkey while in case of Italy it showed a decline.

Continent wise analysis also shows that the exports to Europe had declined and there is increase in exports to America, while Asia dominated with around 60 per cent share in total cotton yarn exports from India. The cotton fabric exports are mainly focussed to the Asian market, and significant presence of Indian fabric exports are seen in the import markets of Sri lanka, Bangladesh, United Arab Emirates (UAE) and Saudi Arabia. A stagnant market share in USA and a declining share in the European countries of Italy and Turkey were visible in the export of cotton fabric. Another noticeable feature was the declining share of the cotton fabric export in the overall textile fabric exports from India. Cotton fabric now account for only 25 per cent of the fabric exports while that of man made fibre based fabric account for around 55 per cent. The increased level of competition from the man made fibre based yarn and fabric was apparent.

In case of the knit and woven apparel exports, Eurpoe and America were the major destinations which absorbed around 70 per cent of the total apparel exports from India. With the quota free trade regime it was expected that India's export to these destinations will increase many fold. The market share index revealed a consistent increase in the export of apparel items to the destinations in Europe and USA. A declining trend in the share could be noticed in case of the UAE and Saudi Arabia along with Canada.

Constant market share analysis : The constant market share (CMS) analysis decomposes the export performance of a commodity into three components namely the market size effect (Import growth effect), effect of market composition and the effect of competition. The CMS analysis is based on the pre supposition that the export share of the base period is sustained in the subsequent time period for the given product. For the purpose of this analysis two periods (average exports during 2001-2003 and 2006-2008), one prior to quota free trade regime and another after removal of quotas was considered, so that we can decompose and identify whether removal of quota system had significantly contributed in the growth of the textile exports. The CMS analysis for individual product groups as well as overall textile exports are presented in Table 4. In case of the over all exports the growth of the market size had played a significant role in the increase in the exports while the growth due to competition effect was around 34 per cent. The increase in market size noticed during the two periods may be attributed

to the removal of quota which has increased the scope for free movement of textile goods across all nations especially USA and EU, who were restricting the imports from the developing nations through quota system.

The negative composition effect shows that the increase in exports were directed towards those destinations which were growing at a much lower rate than the entire region. The CMS analysis for the destination wise export of the major cotton based textile items reveal a mixed trend. The export growth of raw cotton during the two period was mainly due to the increase in the competition effect. The increase in the production of cotton due to technological intervention in the form of *Bt* cotton has created the surplus that could feed the growing domestic as well as the export market. The growth in the exports of raw cotton to the countries in the Asian continent is mainly due to impact of technology rather than the free trade regime. In the case of cotton yarn the competition effect as well as the market size effect were driving the export growth. In case of fabric exports there is a substantial impact of the market size effect, but there is a negative competition effect reflecting the inability to match the other competing exporters resulting in the reduced share of the cotton fabric exports. The positive market composition shows that the exports were mainly to those destinations whose import growth is much faster than the growth of the other regions. The growth in the market size plays a predominant role in the increase of the exports of apparel from India.

Destination wise decomposition analysis was carried out for each of the product groups to get further insight into the nature of the factors favouring export growth. The major importers of each of the commodity were selected for the analysis and the results presented in the Fig. 2. The exports of raw cotton to all the destination were primarily due to the competition effect with little support from the growth of market size. The cotton yarn exports revealed a mixed trend. Growth in exports to the Asian markets were due to the growth in the market size of the importing nations. The Asian market is the traditional market for the exports of cotton yarn from India.

The diversification of the cotton yarn exports to the South American markets as well as export growth in the markets in Europe was driven by the competition effect. In case of the raw cotton and cotton yarn, markets in Asia were the major importers from India. The decomposition of the export of cotton fabrics (Fig. 2) showed a mixed trend across the countries and continents. In Asian countries, the growth of exports in Sri Lanka was due to the competition effect while that to Bangladesh is due to the higher market size effect. There is a negative competition effect in export of fabrics to Bangladesh revealing the increasing level of competition in the international fabric markets. The growth in the market size had enabled India to increase the export of cotton fabric to USA while in case of Italy the competition effect had overpowered the negative growth in the market size to improve the share of our exports. The market size growth in case of the apparel (knit) and apparel (woven) had helped to increase the export growth to majority of the major import destinations of these categories from India. The growth of exports to USA was predominated by the higher share of the competition effect that the increase in the market size.

The production of cotton and its value added products (yarn and fabric) has undergone a tremendous change due to the technological intervention resulting in an increased output levels. Though cotton dominates the total fibre consumption in India there is an increasing competition from the manmade fibre in yarn as well as fabric production. The composition of textile exports reveal a similar trend with increasing presence of man-made fibre based textile exports. The overall export growth of the textile items in the free trade period (2005 onwards) was higher than the previous period but is also associated with the increasing instability in the cotton based textile exports.

The traditional exports exhibited a tendency towards diversification. However, cotton exports showed a tendency towards concentration. The association with new trade partners might have created the instability in the export of yarn and the fabrics. Trade performance measured by the market share index reveals the dominance of Indian exports in Asia (cotton), Asia and South America (cotton yarn) and Asia and Africa (cotton fabric). Decomposition of the export growth of textile

Table 4. Destination wise constant market share analysis for cotton and its value added products

Product group	Market size effect (Import growth effect)	Competition effect	Composition effect
Cotton	6.49	93.00	0.51
Cotton yarn	44.38	52.58	3.04
Cotton fabric	142.51	-135.69	93.18
Apparel knitted	46.90	36.61	16.49
Apparel woven	57.72	36.67	5.62
Cotton based exports	67.37	33.71	-1.081

items reveal that market size effect or the import growth effect predominates the competition effect. Competition effect had a stronger role in case of export growth to USA while the growth in exports to Asian markets were mainly due to increase in the market size.

The study clearly showed that quota free trade regime had improved the market size for the trade of textiles. With increased production level of the cotton, primary raw material for the textile industry, India stand to gain from the open market trade. Another exposition from the study was that there is a decline in the share of the traditional textile exports ie., Cotton textiles comprising of the yarn and fabric, which are intermediate processed products. This shows that there is a increasing consumption in the domestic market for further processing. The technology upgradation at the processing level will provide a synergic effect from both increased competitiveness and quota free trade, boosting the exports and help in improving the textile exports. Though an increasing competition existed for the cotton based exports from the man-made fibre based exports on price front, there always exist an advantage in terms of quality parameter and comfort properties for the natural fibre. There is an urging need to revitalise the processing sector especially garment sector and the made-ups, so that we are able to improve the competitiveness in the production levels and able to exploit the increased trade opportunity.

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