Analysis of trade performance and export competitiveness of Indian textile industries

Manisha (Indian Economic Service probationer, 2022) under the supervision of Prof. Oindrila De and Ms. Sonali Chadha

Contact: 9891481817, maneeshamalik11@gmail.com

Abstract

This paper examines the trade performance of textile industry of India and its competitors namely China and Vietnam by using revealed comparative advantage, value index and compound annual growth rate and also aims to investigate the export competitiveness (EC) of the Indian textile industry by using time series analysis.

Data has been taken from World Integrated Trade Solution (WITS) based on harmonised system (HS-2) including 13 products ranging from HS-50 to HS-63 to depict the RCA. And for exchange rate (ER), real effective exchange rate (REER), CPI and EC , data from RBI reports, annual survey of industries, and central statistical organisation for the period 1990-1991 to 2020-2021 has been used.

The study confirms that India has attained comparative advantage while Vietnam has shown drastic improvement in textile products and has achieved comparative advantage from 2 products to all products during 2005 to 2019. Moreover, China has improved its comparative advantage from 9 products to all products and EC is a challenge that needs to be addressed to sustain in the international market, as the volatile trend can be found for EC in both groups. The findings of the Granger causality test reveal that the presence of unidirectional causality running from ER to EC in the case of both the groups. Also, the select variables are found to be co-integrated in the long run. However, in the case of REER, no causality is found running from REER to EC.

The study concluded that there are immense opportunities for Indian textile industry in world market as most of the products have shown positive growth of export and also the ER is a vital determinant of EC.
Also, exporters can sustain competitiveness in global markets by reducing their profit mark-up in the face of an appreciating currency.

Keywords – Competitiveness, Trade Performance, Growth, Diversification, Sophistication, Textile Industry, Exchange Rate, Export Competitiveness, Real Effective Exchange Rate

(I) Introduction

The Indian textile industry contributes a significant share in terms of industrial production, employment and exports to the Indian Economy. A 10% of total industrial production, 2% of GDP (gross domestic product), employs 45 million workers and 13% of the nation's export earnings (**Ministry of Textiles, 2018-2019**) contributed by Industry.
Although India's share in global textile exports has not made an increase after the 1991 reforms despite the fact that we do have various strengths such as raw material availability, labour availability, etc. The Indian textile exports share in total exports was high i.e., 28% in 1991, which decreased to 14% in 2019.

Indian textile industry has second largest position in the world textile market followed by China. The spectrum consists of activities in decentralised power looms, hosiery and knitting sectors, the handicrafts segments and wide range of fibres such as cotton, silk, man-made fibre, and wool. India's textile exports are largely driven by cotton based clothes.

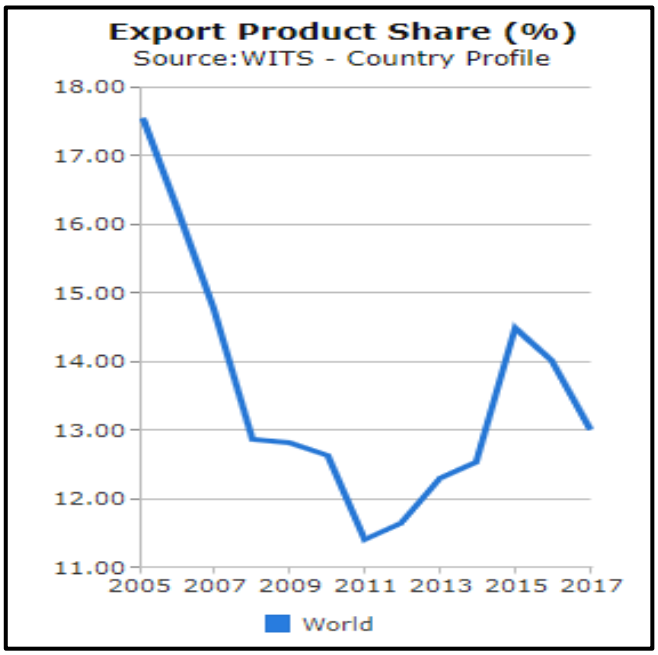
Most of the sectors of textile industry work on a very large scale as India is the largest producer of Jute, the second largest producer of Silk and the third largest producer of Cotton in the world. The Indian textile industry has contributed approximately 14% to the industrial level of output and 17% to total export earnings.
The apparel industry comprises nearly 12% of the total exports of India which is the highest value in terms of foreign revenue earning. The Textile industry has made a valuable contribution in Indian economy in terms of foreign exchange earnings, employment opportunities and industrial production. It has directly employed around 40 million workers and indirectly around 60 million workers. The Indian textile industry is one of the key areas where India has got opportunities to represent at the global level because of the lower cost of labour since it is a labour intensive industry.

However, in global market, India has exported clothing value US$6.46 billion in 2003 constituting 2.9% of world clothing export while china has mounted export value to US$52.06 billion in 2003, increase by 47.7% from 1994. China is evolving as an undisputed global leader on the ground of market share. China's export share has risen to 31.3% as against India's export share of 3.3% in 2018.

Textile Exports by India

Moreover, India has improved its share from 3.0% in 2000 to only 3.3% in 2018. Vietnam has registered an annual growth of 13% in the clothing sector with a share of 6.2% of world trade. India's performance, evaluated against its competitors is not much inspiring. China and Vietnam have reported more growth rate as compared to India. Various factors are responsible for China's leadership position such as more foreign direct investment, cost competitiveness, foreign exchange control etc. but now it seems that China is also losing its share to other countries like Vietnam and other competitors.
It is noted that India's share in the global market has not increased to that extent as compared to other low cost countries such as China, Bangladesh and Vietnam in the T&C sector.

A rising trend has been observed while studying textile exports in India. However, it is not sufficient to study only exports for analysing country's trade performance and competitiveness. There are other parameters also such as composition, direction and trade intensity of an export basket that to be considered and redefining products in terms of quality, quantity and different varieties to be competitive in the global market. In this study, an attempt has been made to understand the structure of the Indian textile and clothing sector and analysing its competitiveness and trade performance as compared to China and Vietnam. Finally, major primary constraints for enhancing competitiveness in the textile sector and required policy measures to resolve these constraints have been explored.



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So, it is required to examine the export competitiveness (EC) and Indian textile industry. EC is an important factor for an economy to survive in the globalized sphere and is also an important tool in measuring the competitiveness of a country. A nation can export products that carry the smallest absolute disadvantages and import goods carrying the largest absolute disadvantage

The study is based on Heckscher–Ohlin (H–O) theory that states that the competitiveness gained by a nation depends upon various factors such as labour and capital. Considering this fact, the study attempts to find whether the EC of textile industry from 1990-1991 to 2020-2021. The rationale behind taking the base year 1991 is that LPG reforms took place during this period. Henceforth, it would be relevant to examine EC to examine those reforms.
No doubt, EC is an important factor for a country to survive in the global arena. It is also essential to mention that the most of these studies are conducted across various industrial sectors including the toy industry, non-financial sector, currency market, agricultural exports, chemicals, metal products, general machinery, electrical machinery, transport equipment, etc.

(II) Literature Review

Competitiveness is specifically essential for a country's performance in the tradable sector (Durand et al., 1992).

Ortega (2010) evaluated the role of technological capabilities in moderating the relationship between competitive strategies and firm performance in Spanish companies. For assessing country trade performance and competitiveness in different industries, many authors have applied revealed comparative advantage (RCA) approach in the past.

Balassa, 1979have used revealed comparative advantage method to study the competitiveness and trade structure of the different economies and sectors.

Jayawickrama and Thangavelu (2010) for examining the trade linkages and degree of export competitiveness in industrial products.

Gao (2007) analysed dynamic changes of the patterns of industries for both China and India and found that China's industrial diversification has attracted more and more foreign investors in China's capital-intensive industry.

Vaidya and Bennett (2007) assessed the extent of shift in China's comparative advantage in manufacturing between 1987 and 2005 and found that while China maintains its competitiveness in low-tech labour-intensive products, it has gained RCA in selected medium-tech sectors (e.g. office machines and electric machinery) and the high-tech telecommunications and automatic data processing equipment sectors.

Existing studies on the relationship between EC and various determinants argue that in changing levels, exporters sustain competitiveness in global markets by reducing their profit margins in the face of an appreciating currency (Athukorala and Menon, 1994; Julian et al., 2014).

In addition to ER, the authors over the past have also emphasized the influence of REER on EC. Many of the previous studies have used REER as an indicator of competitiveness based on their calculations on fixed or periodically updated weighting patterns. It is a well-known fact that the appreciation of the REER minimized the demand for exports

Country	Value (billion dollars) 2015	2016	Share in world exports (%) 2000	2010	2016	Annual percentage change (%) 2010-16	Share in economy's total merchandise exports/export dependence (%) 2010	2014
China[a]	175.0	161.4	18.2	36.7	36.4	4.0	8.2	8.0
Bangladesh	26.0	28.2	2.6	4.2	6.4	11.0	77.4	80.9
Vietnam[b]	22.0	24.6	0.9	2.9	5.5	15.0	14.4	13.0
India	18.0	17.9	3.0	3.2	4.0	8.0	5.0	5.5
Turkey	15.0	15.1	3.3	3.6	3.4	3.0	11.2	10.6

Table I.
Share of selected countries in world clothing exports

Notes: [a]Includes significant shipments through processing zones and does not include Hong Kong, China exports; [b]includes secretariat estimates
Sources: International Trade Statistics (2014)[8]; World Trade Statistical Review (2016)[9]

Nath et al. (2015) Clothing exports 521 examined the patterns, and determinants of comparative advantage in USA services trade with China and India from 1992 to 2010 using revealed comparative advantage measures.

Wei and Chunming (2012) conducted a detailed analysis of the comparative advantage of Chinese manufactures from 2002-09, in world and US markets with the RCA index, and highlighted that most of the products with comparative advantage are low technology products and the comparative advantage of Chinese medium technology products has largely improved, but their RCA indexes are low.

The results of Chan et al. (2008) also indicate that the REER plays a vital part in deciding the quantity of textile exports. In case of appreciation and depreciation of the Indian Rupee against an overseas currency, there will be rise or fall in the exports.

So, from the above discussion, it is clear that there is a lack of agreement on the influence of ER, REER and CPI on international competitiveness. The previous studies as discussed above leave many empirical issues unaddressed. Hence, such significant analytical gaps need to be addressed from the perspective of the Indian textile industry. Therefore, it would be interesting to examine the EC of Indian textile industry and also to study the relationship of select variables on EC. Keeping in view the importance of the present study, the broad objective of the study is to examine the EC of Indian textile industry and also to assess the impact of ER and REER on EC.

(III) Research Methodology and Data Sources

This paper has taken the data from UN 'COMTRADE' for exports and imports of thirteen commodities of the textile industry for the period of 2010 to 2019. Data in terms of trade intensity, diversification and sophistication are taken from the World Integrated Trade Solution (WITS). Trade database is based on harmonised system (HS-2) of two digit level of aggregation which includes 13 products ranging from HS-50 to HS-63. Data period has been chosen based on the availability of datasets for select parameters.

Export Competitiveness is defined as the ratio of India's textile exports to its total output as it reveals the competence of the nation to export textiles out of its domestic production. Taking EC as the ratio of India's textile exports to its total exports was discarded, this is due to the fact that the total exports include exports of other commodities also, and hence, the relative increase or decrease in exports of other commodities will influence the share of textile exports in total exports (Yang et al., 2006).

The ER of rupee has been taken in terms of dollars. REER is defined as the weighted average value of a currency in comparison to the currencies of key trading partners of a nation adjusted with inflation. The REER is measured as the weighted average of the nominal effective exchange rate adjusted by the ratio of domestic price to foreign prices. The data related to ER, CPI and REER has been extracted from the database of the Indian economy, RBI (www.rbi.org).

The paper investigates the secondary data based on time series data collected from published sources such as the Ministry of Commerce, Government of India (GoI); Ministry of Textiles, GoI and UN Comtrade database. The time period selected is 31 years i.e. from 1990-1991 to 2020-2021.

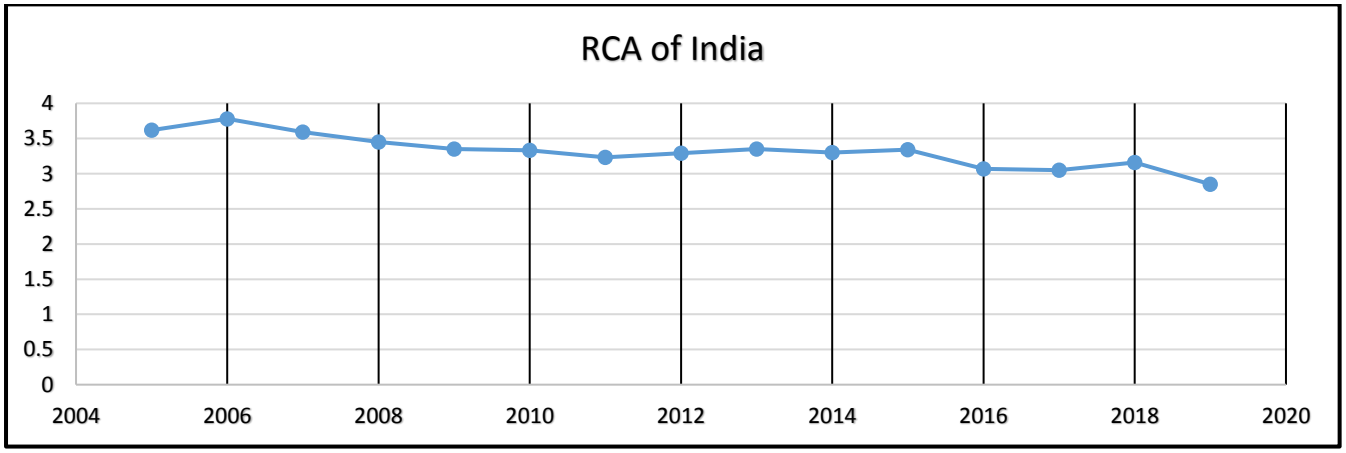
(IV) Data Analysis

Revealed Comparative Advantage (RCA) Index

It basically measures the country's relative advantage or disadvantage in a specific industry as indicated by the trade flows and reflect its competitiveness. It is computed for different textile and clothing categories and compared with the RCA indices of other competitors. When RCA is less than 1, it implies that an export share of a country in a particular sector is less than its global export share in that product or sector implying comparative advantage in that specific sector and vice versa.

$$\text{RCA} = \frac{Xij/Xi}{Xwj/Xw} = \frac{Xij/Xwj}{Xi/Xw}$$

Where: X_{ij}= Country's i exports of product j; X_i = Total exports of country i; X_{wj}= Total exports of product j from the world; X_w = Total world exports.



It was anticipated that India, being a labour-surplus economy, would have a greater share of Textile and clothing segment in its gross domestic product; however, as India is observing the transition phase, the share of T&C industry in its economic growth has decreased significantly.

The clothing and textile industry in India has faced several challenges over the decade such as Supply Chain Management System, Absence of Processing or Dyeing Units, the extent of technology and rate of modernisation etc.

Comparative analysis of revealed comparative advantage in textile product (50–60)

		RCA INDEX in 2010			RCA INDEX in 2019		
Product Code	**Product Description**	**China**	**India**	**Vietnam**	**China**	**India**	**Vietnam**
50	Silk	5.26	7.68	3.06	4.15	2.72	4.28
51	Wool	1.91	0.82	0.10	1.57	0.93	0.04
52	Cotton	2.46	9.29	2.78	2.15	7.06	4.39
53	vegetable textile fibres	2.30	6.60	2.07	2.58	6.52	0.64
54	Man-made filaments	2.49	3.86	2.70	3.67	2.99	1.77
55	Man-made staple fibres	2.38	3.47	3.18	2.89	3.15	1.43
56	Wadding, felt and nonwovens	1.34	0.86	1.35	1.90	1.02	1.21
57	Carpets and floor coverings	1.49	7.24	0.36	1.63	7.42	0.91
58	woven fabrics; tufted textiles	3.46	1.56	0.64	3.53	2.13	0.76
59	Impregnated, coated, covered	2.54	0.47	2.85	2.61	0.70	2.21
60	Knitted or crocheted fabrics	3.56	0.42	1.39	4.25	0.78	2.51
61	Articles of apparel and clothing	4.07	1.99	6.51	2.85	2.43	5.61
62	Articles of apparel and clothing	3.52	2.79	7.36	2.69	2.60	5.77
63	Other made up textile articles	4.13	4.34	3.72	3.68	5.26	2.26

Revealed comparative advantage has been analysed for India and other competitors in the textile and clothing industry. India has attained comparative advantage.

While Vietnam has shown drastic improvement in textile products in achieving the comparative advantage from 2010 to 2019. Moreover, China has improved its comparative advantage in all products ranging from HS-50 to HS-63.

Value Index

Value indices reflect current export or import value adjusted for USD and denoted as a percentage of the average value of the base period i.e. 2000.

$$\text{Value Index} = 100 * \frac{Xt}{Xt = 2000}; \quad 100 * \frac{Mt}{Mt = 2000}$$

X = total exports of the country; M = total imports of the country

Export and Import Value Index

Year	CHINA	INDIA	VIETNAM	CHINA	INDIA	VIETNAM2
2005	43.75	52.12	29.25	55.55	51.82	37.51
2006	56.12	58.45	35.96	60.20	53.33	42.12
2007	67.51	64.16	47.40	58.88	59.00	53.28
2008	73.05	69.45	55.93	57.90	69.57	60.96
2009	63.71	61.85	57.39	49.99	62.43	58.40
2010	81.09	83.00	73.30	69.81	75.99	77.36
2011	97.76	102.11	92.34	91.38	95.79	98.05
2012	100.00	100.00	100.00	100.00	100.00	100.00
2013	111.34	122.97	118.65	98.00	105.03	117.35
2014	116.88	118.10	139.06	87.16	113.58	132.66
2015	111.11	113.70	150.23	78.31	113.67	141.10
2016	102.91	108.40	158.15	69.03	118.04	146.76
2017	104.58	113.88	175.26	76.68	128.21	164.12
2018	108.28	113.24	201.99	85.14	171.65	186.96
2019	105.76	108.57	217.22	80.78	161.58	190.27

The index indicates that whether realised growth or contraction is because of fluctuations in export volume, prices, or both. This parameter gives trade value index based on the World Development Indicator (WDI) database. When the index is less than 100, it implies that value is less than as reported in the base year 2000. Similarly, when the index is more than 100, it implies that value is more than as reported in the base year 2000.

Value index of exports and imports have been presented based on the above data, the massive impact of prices and exchange rate is being observed. Export value index has risen from 52 to 108 reflecting 107.6% change in value from 2005 to 2019. On the other hand, while evaluating the value index of imports, it has been observed that there is 209.6% increase in value while Vietnam is also reflecting similar increasing trends but more improvement as compared to India.

The extent of change in volume exports in India has shown decreasing growth in comparison to China as there is 71% change in volume export index in china as against 59% change in volume export index in India due to many reasons such as infrastructure problem, lesser technological advancement, high transaction cost and incidence of state level duties or other cesses etc. Hence there is a requirement to work upon volume growth in order to obtain a higher growth and shield itself from the adverse impact of either a decrease in the prices or unfavourable change in exchange rates.

Compound annual growth rate (CAGR)

It indicates year-over-year growth rate which is computed by taking the nth root of the total growth rate, where n is the number of years. It is used to evaluate the increasing and decreasing trends of exports and imports with regard to select competitors.

$$CAGR = 100 * \left(\left(\frac{Xijkt2}{Xijkt1} \right)^{\frac{1}{t2-t1}} - 1 \right)$$

Where X is the value of exports of product k from country i to destination j and start and end years are t1 and t2, respectively. CAGR implies a contraction when the value is less than 0 and growth when the value is greater than 0. This parameter gives ranks to products based on their relative importance of a country in its trade value.

Consequently, in case world growth is more than the country growth, the product holds the potential for further growth. This comparison will also suggest if a country needs to withdraw and diversify into other products if the world growth in the category is slowing over the years. Country growth is more than world growth in most of the textile products except silk (50), Vegetable textile fibres, paper yarn, woven fabric (53), Carpets and other textile floor coverings (57), and Knitted or crocheted fabric (60). These products hold more potential for further growth.

(V) Empirical Results

Unit Root Test

This study follows Dickey Fuller Unit Root Technique to verify the stationarity of each time series variable with constant and with constant and trend. The stationarity of series is based on the following equation:

$$\Delta Xt = B0 + B1\ Xt\text{-}1 + B2\ Xt + B3\ \Delta Xt\text{-}1 + \ldots\ldots Bp\text{-}1\ \Delta\ Xt\text{-}p\text{+}1 + et$$

First, the test for each of the series is conducted at levels. However, for the series that were not stationary at levels, then test was conducted at first difference.
It is considered to examine whether the series is stationary or not, the ADF test is being performed. The null hypothesis (H0) is that the series has a unit root.

Null Hypothesis: D(EXCOMPETITIVENESS) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.022310	0.0043
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Null Hypothesis: D(EXCHANGERATE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.162532	0.0002
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Null Hypothesis: D(REER) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.964491	0.0000
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.269869	0.0002
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

The number of lags used in the test is determined by the AIC criterion. The computed values of test statistics are compared with the critical values and the probability values are used for rejecting the null hypothesis. From the results, it can be seen that all the variables were non-stationary at levels, hence first difference was taken to make them stationary. The Unit Root Test for each of the series is then tested at first difference. The results show that all the variables are stationary at first difference.

Optimal Lag Length

After performing the unit root tests, the next step is to explore for the optimum lag length to perform further assessment in the study. The optimum lag length in the present study is observed using the Akaike information criterion (AIC).

Under this method, AIC values of vector autoregressive model estimated for various combinations of lag length are used. VAR Model of first differenced variables is run to determine optimal lag length. Optimal lag is coming out to be 2 according to AIC criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	87.83306	NA	2.95e-08	-5.988075	-5.797761*	-5.929894*
1	105.6186	29.21915	2.64e-08	-6.115616	-5.164041	-5.824710
2	125.4807	26.95572*	2.16e-08*	-6.391481*	-4.678647	-5.867850

Johansen Co-Integration Test

This test was introduced by Granger(1981) and Engle and Granger (1987) to examine the long-run relationship between the variables. The results of Johansen test give two test statistics i.e. trace test and maximum eigenvalue test. Trace test

is a joint test in which the H0 states that the number of co-integrating vectors is less than or equal to r (co-integration rank). The maximum eigenvalue test conducts separate tests on each eigenvalue and the Ho, in this case, is that the number of co-integrating vector is r against an alternative r þ 1.

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.864956	95.38979	47.85613	0.0000
At most 1 *	0.476451	39.32944	29.79707	0.0030
At most 2 *	0.426564	21.20995	15.49471	0.0062
At most 3 *	0.182406	5.638917	3.841466	0.0176

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.864956	56.06034	27.58434	0.0000
At most 1	0.476451	18.11950	21.13162	0.1254
At most 2 *	0.426564	15.57103	14.26460	0.0309
At most 3 *	0.182406	5.638917	3.841466	0.0176

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

This test is performed to examine the presence of a long-run relationship between the select variables. As the variables are non-stationary at the level and all the variables are integrated of the same order at first difference i.e. I (1), so Co-integration test can be applied. Above table highlights the results of trace and maximum eigenvalue statistics from which the number of co-integrated equations or long relationships between the variable can be examined.

The null hypothesis is rejected when the estimated value of trace statistics and maximum eigenvalue statistics is more than the critical values at a 5% significance level. The Results give an indication for the existence of long run relationship. The findings of the test reveal that the trace test has four co-integrating equations and maximum eigenvalue statistics have one co-integrated equation in the model, which reveals the long-run relationship between the select variables.

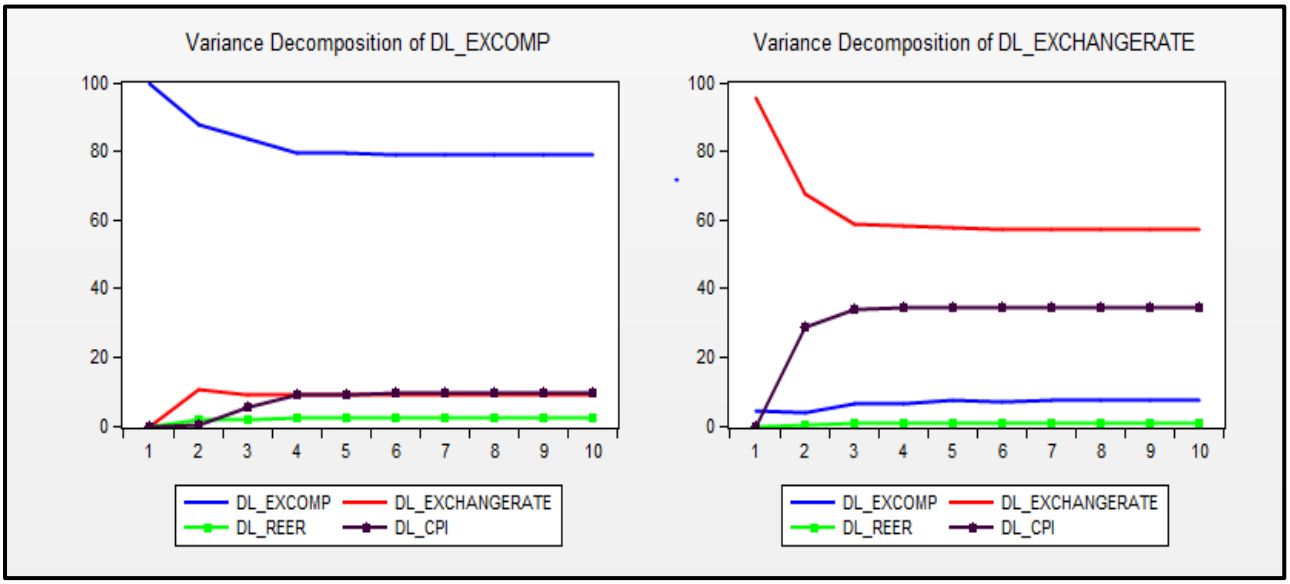
Variance Decomposition Analysis

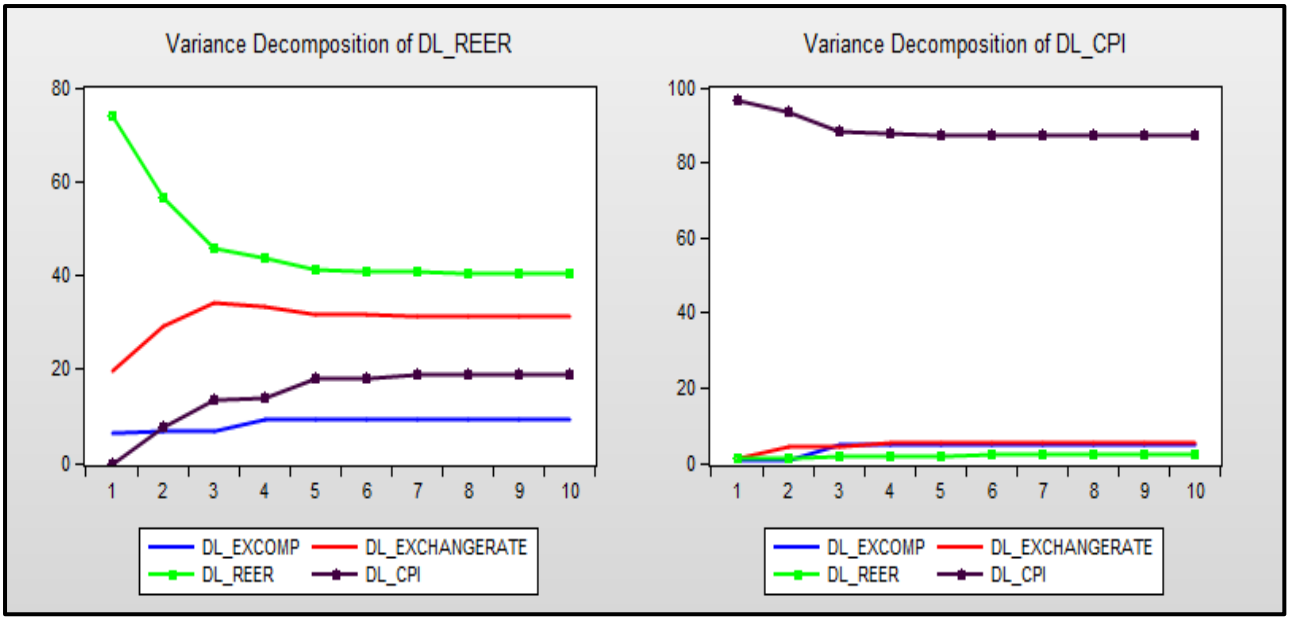
Variance Decomposition analysis helps to explain the reaction of a given series y(t) due to shocks arising from another series x(t) over a period of time. The combined graphs below decompose the impact of various factors affecting a stationary series. The y-axis measures the percentage of variation explained and x-axis denotes time period. The following discussion is based on growth rate series of the given sectors.

The variance Decomposition of export competitiveness of textile shows that exchange rate explains 9.1% of variation, real effective exchange rate explains 2.2% of variation and CPI explains 9.8% of variation in the export competitiveness of textile by the tenth period.

Variance Decomposition of DL_EXCOMP:

Period	S.E.	DL_EXCOMP	DL_EXCHA...	DL_REER	DL_CPI
1	0.095496	100.0000	0.000000	0.000000	0.000000
2	0.105685	87.74385	10.40014	1.726615	0.129400
3	0.114025	83.60139	9.034055	1.988364	5.376193
4	0.116974	79.65207	9.040405	2.298711	9.008809
5	0.118528	79.47560	9.024272	2.240940	9.259185
6	0.118784	79.14816	9.151749	2.232342	9.467751
7	0.119235	78.97446	9.163938	2.226078	9.635528
8	0.119349	78.83530	9.166714	2.238426	9.759556
9	0.119458	78.80096	9.164989	2.238659	9.795397
10	0.119486	78.76839	9.178515	2.239638	9.813458





Vector Error Correction Model

The VECM combines the long-run information with short-run adjustment mechanism. VECM allows all the variables in the model to interact with each other.

It also examines the impact of the variable on itself and on the other variables. After the determination of long run relationship, VECM result also give an evidence of short run relationship between Export Competitiveness, Exchange Rate, REER and CPI. This can be concluded from the fact that at least one of the co-integrating equation coefficient is coming out to be negative and significant. This shows the speed of adjustment in case of short run deviation in any variable to the long run equilibrium.

Cointegrating Eq:	CointEq1
DL_EXCOMP(-1)	1.000000
DL_EXCHANGERATE(-1)	4.921012 (0.82368) [5.97445]
DL_REER(-1)	-4.951206 (0.61839) [-8.00658]
DL_CPI(-1)	-0.421052 (0.21519) [-1.95665]
C	-0.156901

Error Correction:	D(DL_EXCO...	D(DL_EXCH...	D(DL_REER)	D(DL_CPI)
CointEq1	-0.015367 (0.04140) [-0.37120]	-0.088393 (0.02509) [-3.52336]	0.276592 (0.02530) [10.9320]	0.079708 (0.16274) [0.48978]
D(DL_EXCOMP(-1))	-0.513247 (0.15367) [-3.33987]	0.009240 (0.09313) [0.09922]	-0.033720 (0.09392) [-0.35903]	0.305082 (0.60412) [0.50500]
D(DL_EXCHANGERATE...	-0.610027 (0.34631) [-1.76152]	0.007540 (0.20987) [0.03593]	-0.833825 (0.21166) [-3.93954]	-1.030357 (1.36142) [-0.75682]
D(DL_REER(-1))	-0.209056 (0.16431) [-1.27237]	-0.229750 (0.09957) [-2.30738]	0.075105 (0.10042) [0.74791]	-0.144176 (0.64592) [-0.22321]
D(DL_CPI(-1))	0.017634 (0.05040) [0.34987]	0.081508 (0.03054) [2.66856]	0.030059 (0.03080) [0.97584]	-0.480125 (0.19814) [-2.42319]
C	-0.017060 (0.01921) [-0.88825]	-0.004686 (0.01164) [-0.40260]	-0.007687 (0.01174) [-0.65489]	-0.009894 (0.07550) [-0.13104]

Dependent Variable: D(DL_EXCOMP)
Method: Least Squares
Date: 06/23/22 Time: 23:56
Sample (adjusted): 1993 2020
Included observations: 28 after adjustments
D(DL_EXCOMP) = C(1)*(DL_EXCOMP(-1) + 4.92101156957
*DL_EXCHANGERATE(-1) - 4.9512055902*DL_REER(-1) -
0.421051880959*DL_CPI(-1) - 0.156901296309) + C(2)
*D(DL_EXCOMP(-1)) + C(3)*D(DL_EXCHANGERATE(-1)) + C(4)
*D(DL_REER(-1)) + C(5)*D(DL_CPI(-1)) + C(6)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.015367	0.041397	-0.371204	0.7140
C(2)	-0.513247	0.153673	-3.339872	0.0030
C(3)	-0.610027	0.346308	-1.761517	0.0920
C(4)	-0.209056	0.164305	-1.272365	0.2165
C(5)	0.017634	0.050401	0.349872	0.7298
C(6)	-0.017060	0.019206	-0.888250	0.3840

After the co-integration relationship has been established in the long-run, the next step is the estimation of short-run disequilibrium. As per literature, the long-run coefficients or error correction terms must be negative and significant. The results of the VECM model are presented and depict that the long-run coefficient of co-integrating model C(1) is negative and significant. Hence, it can be concluded that

there is long-run causality running from independent variables (IVs) i.e. ER, REER and CPI to the dependent variable (DV) i.e. EC for the textiles industry.

Granger Causality Test

This test is performed to explain the direction of causation between the select variables for the purpose of analysis. Pairwise Granger causality test showed that Exchange Rate causes the change in Export Competitiveness as the null hypothesis (Exchange Rate does not granger causes Export Competitiveness) is rejected at 1% significance level. However, Export Competitiveness rate does not granger causes the Exchange Rate as the null hypothesis (Export Competitiveness does not granger causes Exchange Rate) is not rejected at 1% significance. Thus, the causality is uni - directional from Exchange Rate to Export Competitiveness. Apart from that, there was no causality found between any of the other variables studied in the analysis.

Null Hypothesis:	Obs	F-Statistic	Prob.
DL_EXCHANGERATE does not Granger Cause DL_EXCOMP	28	3.19376	0.0597
DL_EXCOMP does not Granger Cause DL_EXCHANGERATE		0.55291	0.5827
DL_REER does not Granger Cause DL_EXCOMP	28	0.32873	0.7232
DL_EXCOMP does not Granger Cause DL_REER		1.24666	0.3062
DL_CPI does not Granger Cause DL_EXCOMP	28	0.67046	0.5212
DL_EXCOMP does not Granger Cause DL_CPI		0.19677	0.8227
DL_REER does not Granger Cause DL_EXCHANGERATE	28	0.12861	0.8799
DL_EXCHANGERATE does not Granger Cause DL_REER		15.2951	6.E-05
DL_CPI does not Granger Cause DL_EXCHANGERATE	28	7.33483	0.0034
DL_EXCHANGERATE does not Granger Cause DL_CPI		0.66590	0.5234
DL_CPI does not Granger Cause DL_REER	28	1.02856	0.3734
DL_REER does not Granger Cause DL_CPI		0.01664	0.9835

This test is estimated to examine the direction of causality between the EC and other variables. The null hypothesis of the Granger causality test is that x does not Granger-cause y and y does not Granger-cause x. The findings of this test are given for the textile industry. The findings of this test reveal that the presence of unidirectional causality running from ER to EC in the case of both the groups. This indicates that the ER has effects on the EC for both the groups, however in the case of REER, no causality is found running from REER to EC and same for the CPI, no causality is there from CPI to EC.

Impulse Response Function

Further, impulse response functions are better understood with the help of graphical results as below. These graphs depict responses of ER, REER and CPI to one s.d. shock in EC. Thus, x-axis denotes the time periods and y-axis denotes the response.

Response of exchange rate to export competitiveness

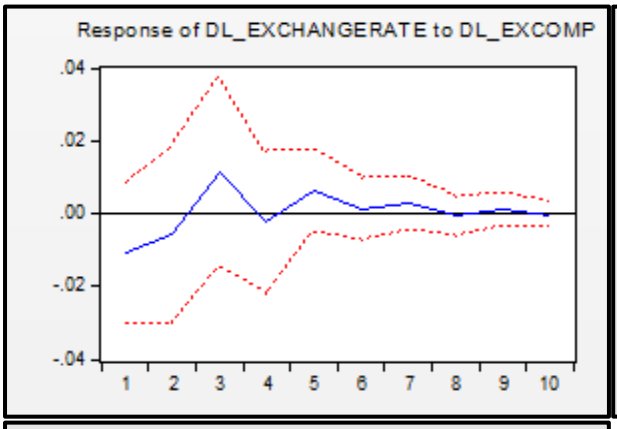
The function follows a zig-zag path with no discernible trajectory and converges to 0 in the long run.

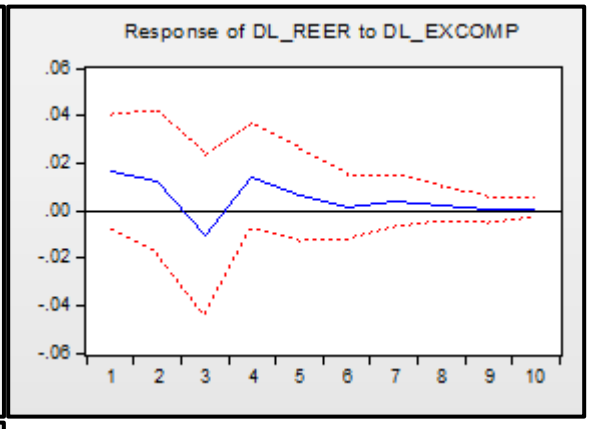
Response of REER to export competitiveness

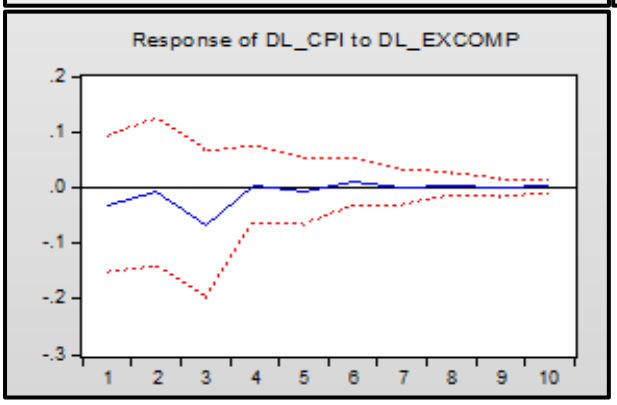
The initial shock in export competitiveness contributes positively to its REER in the first and second time period.

This impact quickly turns negative in the next time period.

The function follows a convergence path.







Response of CPI to export competitiveness

The initial shock in export competitiveness contributes negatively to CPI till the fourth time period.
The impact converges to 0 in the long run as expected.

(VI) Conclusion

India has attained a comparative advantage but lower as compared to Vietnam from 2005 to 2019. Moreover, China has improved its comparative advantage to all products ranging from HS-50 to HS-63. There are immense opportunities for the Indian textile industry in the world market as most of the products have shown positive growth of export. Country growth is more than world growth in most of the textile products.

Literature has shown that Low productivity, quality, restricted diversification, product differentiation, limited infrastructure especially in weaving and finishing fabrics are primary constraints undermining the competitiveness of Indian textile segment. The clothing and textile industry in India has faced several challenges over the decade such as Supply Chain Management System, Absence of Processing or Dyeing Units, the extent of technology and rate of modernisation etc. As a result, there is an urgent need for modernisation in case of processing units.

Indian textile industry demand greater investment for modernisation and technology up gradation. On the positive side, India has the advantage of cheap labour which is responsible for enhancing competitiveness in producing cotton yarn, woven ring yarn and knitted ring yarn in the international export market.

Since country growth is more than world growth in all textile products except silk. To confront international competitiveness, necessary training facilities should be provided with proper adherence to international labour standard. There has been a drop in the value of low technology which is a healthy sign of technological advancement and in terms of improving competitiveness. In China and Vietnam, the proportion of high tech products is more as compared to India. Indian Textiles sector should use the latest technology to remain internationally competitive.

Several policy reforms are crucially needed in order to take advantage of latent capability in the Indian textile industry. Competitiveness can be increased by improving quality, marketing and supply constraints. There is a need to have an appropriate set of institutions to promote the efficient absorption of imported technology and its diffusion in the textile segment by fostering effective inter-firm linkages, to create and stimulate the development of human capital and to develop a set of national standards.

The study attempts to examine the EC of Indian textile from 1990-1991 to 2020-2021. No doubt, economic reforms in India have relaxed the barriers to the trade but this in no way will guarantee growth in the export shares and there will be the survival of only the fittest. The findings of the Granger causality test reveal that the presence of unidirectional causality running from ER to EC. This indicates that the ER has effects on the EC. Also, the select variables are found to be co integrated in the long run. Therefore, it can be concluded that exporters can sustain competitiveness in global markets by reducing their profit mark-up in the face of an appreciating currency.

However, in the case of REER, no causality is found running from REER to EC. The findings of Granger causality reveal that the trace test and maximum eigenvalue statistics have four co-integrated equations and one co-integrated equation in the model, which reveals the long-run relationship between the select variables.

Also, results of VECM reveal that there is long-run causality running from IVs i.e. ER, CPI and REER to the DV i.e. EC for the textile industry. Depreciation in rupee can make the exports cheaper in the world market and will increase the demand for exported goods, but this has a limited scope as it will also increase the cost of imported inputs. The findings of this study have many important policy and trading implications. The results are expected to help in establishing a significant causal and long-run relationship between ER, REER and EC especially, on deciding how to increase the EC of the textile industry. Besides, ER may not be directly controllable on the part of various exporters, so the policymakers need to formulate various strategies to increase the EC of the industry. One possible remedy for declining EC can be obsolete technology.

So, the exporters are required to replace the obsolete technology with the modern one and for this purpose, the textile exporters have to invest in the technology. Alternatively, exporters can also look at the border sharing countries for exports. The firms are suggested to make the most of the larger funds available under the Technology Upgradation Fund Scheme. The firms can also minimize the labour

costs to gain competitiveness in the world markets. However, this practice needs to be wisely formulated as at times the firms may follow an unsustainable path of cost-cutting strategies to join the global value chain.

(VII) Policy Recommendation

- **Home demand creation**: Allow Foreign Direct Investment (FDI), reduce the import duty
- **Promote fair competition**: rationalise excise duty structure, remove policy-bias against synthetic fibre
- **Regulations and Controls**: plethora of regulations like Cotton Control Order, Essential Commodities Act
- **Infrastructure**: port, inland transportation, power, and communication, Special Economic Zones
- **Modify Labour related Provisions**
- **Clusters for Competitiveness- Supply Chain Perspective**: conglomerations should be promoted to evolve as "Centres of Excellence"
- **Compete- Policies on Investing Abroad**: PTAs with world's big markets

Indian textile and clothing industry has a great potential, which has not been cultivated for global performance. The above set of recommendations would provide the right kind of institutional context and investment climate for the Indian firms engaged in these sectors to rise to the occasion. As for making the Indian textile and clothing industry globally competitive, the government can trust the ingenuity of the Indian entrepreneurs.

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