INDIA'S TRADE RELATIONS WITH BRICS MARKETS AN EMPIRICAL ANALYSIS

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ABSTRACT: The BRICS countries played a pivotal role in the other developing and emerging economies since 2008-09. 13th BRICS summit was held in September 2021. India's exports to BRICS increased from US $ 12916.41 million to US $ 32021.81 million during the period 2006-07 to 2020-21, while imports from BRICS increased from US $ 23346.57 million to US $ 81282.19 million. The regression analysis implies that in respect of all commodity and principal commodity exports of India to BRICS markets, the coefficients of GDP BRICS are positive and found to be statistically significant at 1 percent level in respect of 7 out of 12 equations estimated. The analysis clearly implies that, Indian exports to BRICS are more income elastic rather price elastic.

Key words: Export, Import, BRICS, GDP, REE, India

Introduction

Regional trading arrangements are being pursued by different countries on account of a variety of reasons. However, apart from other reasons, possible prospects of enhanced economic growth are the common agenda of motivation for all countries. Economic integration of any type helps expand the regional markets, reaps economies of large scale production, promotes specialisation, foster foreign investments and makes available the foreign technology. Regional cooperative measures for promotion of trade dates back to 1950 during which, European Coal and Steel Community (ECSC) was initiated by France through the economic integration of the Steel and Coal industries of France, Italy, Belgium, Luxemburg, Netherlands and West Germany. Organisation for European Economic Cooperation (OEEC) was established in 1948 with all the European countries (excluding Communist bloc) with the objective of launching the Marshall Aid Programme. However, the then OEEC itself later transformed into the organisation for Economic Cooperation and Development (OECD).

The emergence of European Economic Community (EEC- Belgium, France, Germany, Italy, Luxemburg and the Netherlands) in 1959 can be regarded as a source of inspiration for many other regional groupings across the globe. Consequently, many regional groups emerged so as to cater to the trade needs in different parts of regions of the world. Some important groups are such as European Free Trade Association (EFTA – Austria, Denmark, Great Briton, Norway, Portugal, Sweden and Switzerland 1960), Latin American Free TRADE Association (LFTA- Argentina, Brazil, Chile, Mexico, Paraguay, Peru, and Uruguay 1960), Central American Common Market (CACM-Coastarica, E1salvator, Guatemala, , Nicaragua, and Panama 1960), Association of South East Asian Nations (ASEAN – Indonesia, Malaysia, Philippines, Singapore, and Thailand, 1967), Caribbean Free Trade Association (CARIFTA-Trinidad, Guyana, Barbados, and Antigua 1968), North American Free Trade Association (NAFTA – USA, Canada and Mexico, 1994).

The SAARC was formally founded at the first summit conference of 7th and 8th December 1985 in Dacca with member countries India, Pakistan, Bangladesh, Srilanka, Nepal, Bhutan and Maldives.

Bric was formed in June 2006, BRIC is a group of acronym which refer to the countries of Brazil, Russia, India and China it is typically rendered as 'The BRIC', 'the BRIC Countries', 'The BRIC economies', or alternatively as the 'Big Four'. The name has been changed to BRICS after the addition of South Africa in 2010. Bilateral trade between South Africa and India has grown rapidly since 2004 at annual rate of 30 percent and was worth 81 billion rand in 2013. Hence the study period for BRICS markets is considered from 2006 to 2021 for the study. The BRICS countries played a pivotal role in the other developing and emerging economies since 2008-09. The first Summit of the four-member BRIC bloc (Brazil, Russia, India and China) was held in Yekaterinburg, Russia in June 2009.13th BRICS summit was held in September 2021.

Objectives, Data Sources and Techniques

The specific objectives of the paper are

1. To examine the trade performance of BRICS.
2. To analyse the trends and share of India's trade position in BRICS.
3. To study about the price competitiveness of Indian exports to BRICS.

DATA SOURCES AND TECHNIQUES

In order to pursue the objectives, secondary data relating to exports, imports and commodity wise trade are drawn from official site of Ministry of Trade, Department of Commerce, Export Import Data Bank, while data relating to the GDP of BRICS countries is tapped from World Bank, World development indicators. Data relating to real effective exchange economy, published by reserve bank of India. The study is confined to 2006-2021. In order to analyse the trends in exports and imports growth rates are estimated by considering the semi log linear form given by $\log Y = \beta_0 + \beta_1 t$, where Y is the dependent variable, t is the trend variable, , $\beta 0$ is the intercept term and β_1 is the slope. Thus β_1 indicates the growth rate. Further, in order to study the price competitiveness of Indian exports to BRICS, multiple log linear regression model given by $\log X_i = \beta_0 + \beta_1 \log GDP\ BRICS + \beta_2 \log REER + u$ is considered. In the model X_i is the export of ith commodity (i=1,2, ….11) to BRICS (in US\$ million) and the list is given separately. The variable GDP BRICS is the summation of gross domestic product of BRICS countries other than India, REER is the India's real effective exchange rate, β_0 is the intercept term, while β_1 and β_2 are the parameters indicating the elasticity of Indian exports with respect to gross domestic product of BRICS countries other than India and India's real effective exchange rate. Further, u is the stochastic term. The rationale for considering the variables is, because the demand for exports of a country depends on not only on income of the importer but also on the export price of the supplier country. Hence, the REER is considered to reflect the export price. On a priori grounds, the sign of β_1 expected to be positive since, higher the income, the greater will be the imports of a country. Further, if exports price is competitive, then greater will be the imports and vice versa, hence positive sign is expected for β_2 when price is competitive, while negative sign is expected for β_2 when the price is not competitive, the regression equation is estimated by applying OLS Method under given assumptions. Using SPSS -25 Verson.

Commodities considered

Top eleven principal commodities of India's exports to BRICS Countries are observed from the list of 2-digit HS code and is obtained from the official site of Ministry of trade, Department of Commerce, Export-Import data bank and the following is the list.

X_1= Ores, Slag and Ash (HS Code 26)

X_2 = Mineral Fuels and related Products (HS Code 27)

X_3 = Organic Chemicals (HS Code 29)

X_4 = Pharmaceutical Products (HS Code 30)

 X_5 = Plastic and Rubber related Products (HS Code 39 and 40)

X_6= Cotton (HS Code 52)

X_7 = Iron and Steel and related articles (HS Code 72 and 73)

X_8 = Copper and Articles (HS Code 74)

X_9 = Nuclear Reactors, Boilers, Machinery and Mechanical Appliances (HS Code 84)

X_{10}= Electrical Machinery and related Equipment (HS Code 85)

X_{11} = Motor Vehicles and Accessories (HS Code 87)

X_{TE} = Total Exports to BRICS

ANALYSIS OF TRENDS AND SHARE OF INDIA'S TRADE POSITION IN BRICS

Table 1 presents information about trends in India's total exports, imports, total exports to BRICS and total imports from BRICS. From the table, India's total exports which stood at US \$ 126414.1 million in 2006-07 increased to US \$ 291808 million by 2020-21 and registered an annual growth rate of 4.49 percent. At the same time, total imports of the country increased from US \$ 185735.2

million to US $ 394435.9 million and recorded an annual growth rate of 3.95 percent. Thus total export-import gap has been decreasing at the rate of 0.54 percent points indicating an average gap of US $ 132016.8 million over the study period.

Further, India's exports to BRICS increased from US $ 12916.41 million to US $ 32021.81 million during the period 2006-07 to 2020-21, while imports from BRICS increased from US $ 23346.57 million to US $ 81282.19 million. Further, annual growth rates of India's exports to BRICS and imports from BRICS are found to be 3.66 and 6.45 percent respectively. Thus total export-import gap has been increasing at the rate of 2.79 percent points. However, in absolute terms on the average exportable deficit of India over the study period stood at US $ 43346.68 million and thus accounted for 34.33 percent. Further, the share of exports to BRICS Countries in total Indian exports varied between 6.42 to 10.97 per cent. While the share of imports from BRICS Countries in total Indian imports varied from 12.57 per cent to 20.90 percent. Thus India being a dependent country among the BRICS nations is not in a position to properly tap the BRICS market.

Table 1 : India's Exports and Imports   US $ Million

Year	Total Exports	Total Imports	Exports to BRICS	Imports from BRICS
2006-07	126414.1	185735.2	12916.41 (10.22)	23346.57 (12.57)
2007-08	163132.2	251654	16998.6 (10.42)	34179.37 (13.58)
2008-09	185295.4	303696.3	15081.55 (8.14)	43524.84 (14.33)
2009-10	178751.4	288372.9	17071.36 (9.55)	43503.28 (15.09)
2010-11	249815.6	369769.1	23794.82 (9.52)	57769.21 (15.62)
2011-12	305963.9	489319.5	30355.74 (9.92)	75321.12 (15.39)
2012-13	300400.6	490736.6	26986.02 (8.98)	70193.54 (14.30)
2013-14	314405.3	450199.8	27572.38 (8.77)	64725.22 (14.38)
2014-15	310338.5	448033.4	25297.07 (8.15)	76559.82 (17.09)
2015-16	262291.1	381007.7	16837.58 (6.42)	76281.44 (20.02)
2016-17	275852.4	384357	18055.36 (6.55)	76783.77 (19.98)
2017-18	303526.2	465581	22335.62 (7.36)	97287.08 (20.90)
2018-19	330078.1	514078.4	27009.36 (8.18)	87083.84 (16.94)
2019-20	313361	474709.3	27705.98 (8.84)	82398.52 (17.36)
2020-21	291808.5	394435.9	32021.81 (10.97)	81282.19 (20.61)
Growth rate	4.49*	3.95*	3.66*	6.45*
Average	260762.3	392779.1	22669.31	66015.99
CV	25.04	24.94	26.71	32.07

Note: * indicates the growth rates are statistically significant at 1 percent. Figures in the parenthesis indicate share of BRICS in total exports and imports of India. Source: Ministry of Commerce and Trade, Department of Commerce, Export Import Data Bank

Table 2
India's Exports to BRICS Countries
US$ Million

Year	Brazil	Russia	China	South Africa
2006-07	1449.25	903.69	8321.86	2241.61
	(1.15)	(0.71)	(6.58)	(1.77)
2007-08	2525.9	940.61	10871.34	2660.75
	(1.55)	(0.58)	(6.66)	(1.63)
2008-09	2651.43	1096.34	9353.5	1980.28
	(1.43)	(0.59)	(5.05)	(1.07)
2009-10	2414.29	980.69	11617.88	2058.5
	(1.35)	(0.55)	(6.50)	(1.15)
2010-11	4024.16	1689.43	14168.86	3912.37
	(1.61)	(0.68)	(5.67)	(1.57)
2011-12	5769.75	1778.27	18076.55	4731.17
	(1.89)	(0.58)	(5.91)	(1.55)
2012-13	6048.53	2295.68	13534.88	5106.93
	(2.01)	(0.76)	(4.51)	(1.70)
2013-14	5552.47	2121.26	14824.36	5074.29
	(1.77)	(0.67)	(4.72)	(1.61)
2014-15	5963.82	2097.01	11934.25	5301.99
	(1.92)	(0.68)	(3.85)	(1.71)
2015-16	2650.34	1587.81	9011.36	3588.07
	(1.01)	(0.61)	(3.44)	(1.37)
2016-17	2400.46	1937.06	10171.89	3545.95
	(0.87)	(0.70)	(3.69)	(1.29)
2017-18	3063.49	2113.39	13333.53	3825.21
	(1.01)	(0.70)	(4.39)	(1.26)
2018-19	3800.49	2389.47	16752.2	4067.2
	(1.15)	(0.72)	(5.08)	(1.23)
2019-20	3967.39	3017.67	16612.75	4108.17
	(1.27)	(0.96)	(5.30)	(1.31)
2020-21	4244.94	2655.52	21187.15	3934.2
	(1.45)	(0.91)	(7.26)	(1.35)
Growth rate	2.404**	6.964*	3.664*	3.325*
Average	3768.447	1840.26	13318.16	3742.446
CV	39.59007	35.1504	27.67356	29.25603
t value	1.01735	6.891311	2.649416	2.128063

Note: * indicates the growth rates are statistically significant at 1 percent.
** indicates the growth rates are statistically significant at 5 percent.
Figures in the parenthesis indicate share of BRICS in total exports and imports of India.
Source: Ministry of Commerce and Trade, Department of Commerce, Export Import Data Bank

Table 3
India's Imports from BRICS Countries
US $ Million

Year	Brazil	Russia	China	South Africa
2006-07	992.35	2409.05	17475.03	2470.14

	(0.53)	(1.30)	(9.41)	(1.33)
2007-08	949.45	2478.16	27146.41	3605.35
	(0.38)	(0.98)	(10.79)	(1.43)
2008-09	1185.96	4328.28	32497.02	5513.58
	(0.39)	(1.43)	(10.70)	(1.82)
2009-10	3437.97	3566.79	30824.02	5674.5
	(1.19)	(1.24)	(10.69)	(1.97)
2010-11	3548.88	3600.02	43479.76	7140.55
	(0.96)	(0.97)	(11.76)	(1.93)
2011-12	4271.47	4764.31	55313.58	10971.76
	(0.87)	(0.97)	(11.30)	(2.24)
2012-13	4825.76	4231.56	52248.33	8887.89
	(0.98)	(0.86)	(10.65)	(1.81)
2013-14	3720.94	3894.4	51034.62	6075.26
	(0.83)	(0.87)	(11.34)	(1.35)
2014-15	5400.91	4249.22	60413.17	6496.52
	(1.21)	(0.95)	(13.48)	(1.45)
2015-16	4040.09	4584.98	61707.95	5948.42
	(1.06)	(1.20)	(16.20)	(1.56)
2016-17	4114.69	5552.3	61283.03	5833.75
	(1.07)	(1.44)	(15.94)	(1.52)
2017-18	5498.22	8573.46	76380.7	6834.7
	(1.18)	(1.84)	(16.41)	(1.47)
2018-19	4406.43	5840.44	70319.64	6517.33
	(0.86)	(1.14)	(13.68)	(1.27)
2019-20	3074.97	7093.01	65260.75	6969.79
	(0.65)	(1.49)	(13.75)	(1.47)
2020-21	3015.99	5485.75	65212.25	7568.2
	(0.76)	(1.39)	(16.53)	(1.92)
growth rate	5.42*	6.24*	7.01*	2.73**
Average	3498.94	4710.12	51373.08	6433.85
CV	41.88	34.64	33.91	30.73
t Value	2.56	4.91	8.76	1.56

Note: * indicates the growth rates are statistically significant at 1 percent.

* *indicates the growth rates are statistically significant at 5 percent.

Figures in the parenthesis indicate share of BRICS in total exports and imports of India.

Source: Ministry of Commerce and Trade, Department of Commerce, Export Import Data Bank

Table 2 presents information about trends in Indian commodity exports to different BRICS countries. During the study period among the BRICS countries, average Indian commodity exports are observed to be highest to China (about US $ 13318.16 million) followed by Brazil (about US $ 3768 million), South Africa (about US $ 3742 million) and Russia (about US $ 1840 million) in the order. However, analysis of growth rates implies that Highest growth (about 6.96 percent) is observed in commodity exports to Russia followed by China (about 3.66 percent), South Africa (about 3.32 per cent) and Brazil (2.4 per cent) in order. Further based on CV values Indian exports to China are not only highest but are more consistent. India can explore the possibilities of tapping the Brazil, Russia and South Africa market.

Table 3 furnishes details about trends in Indian commodity imports from different BRICS countries. During the study period among the BRICS countries, average Indian commodity imports are found to be highest from China (about US $ 51373 million) followed by South Africa (about US

$ 6444 million), Russia (about US $ 4710 million) and Brazil (about US $ 3499 million) in the order. Based on the average value of exports and imports of India from other BRICS countries, India is found to earn trade surplus from Brazil (7.70 per cent) only, while other BRICS countries has deficit, highest deficit with South Africa (58.16 Percent) followed by Russia (39.07 percent) and China (25.92percent) in order. Based on export import growth rates, India expected to enjoy South Africa only.

Table 4 furnishes the details about India's export of top eleven commodities to BRICS markets in terms of percentage. During the study period, among the different commodities that are exported by India to BRICS markets, Mineral fuels and related products (X_2) topped the list with an average share of 13.71 percent followed by, Ores, Slag and Ash (X_1) with an average share of 13.30 percent, Cotton (X_6) with an average share of 8.28 percent, Organic Chemicals (X_3) with an average share of 7.88 percent, Copper and Articles (X_8) with an average share of 4.58 percent, Pharmaceutical Products (X_4) with an average share of 4.37 percent, Nuclear reactors, Boilers etc (X_9) with an average share of 4.30 percent, motor vehicles and accessories (X_{11}) with an average share of 4.22 percent , Iron and steel and related articles (X_7) with an average share of 4.05 percent, Electrical machinery and related equipment (X_{10}) with an average share of 3.99 percent, Plastic and Rubber Products (X_5) with an average share of 3.79 percent respectively. The average share of the top elevencommodities considered for the study is noticed to be about 71.87 percent in the total commodity exports of India to BRICS markets.

TABLE 4
SHARE OF PRINCIPAL COMMODITIES IN INDIA'S EXPORTS TO BRICS (%)

Year	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2006-07	29.59	0.23	5.53	3.67	4.42	6.38	5.76	4.20	2.41	1.36	2.62
2007-08	36.42	0.21	5.07	3.14	2.49	7.11	2.43	2.43	2.76	1.62	1.61
2008-09	31.95	0.21	4.46	4.57	2.32	3.64	4.15	0.87	3.22	3.16	1.92
2009-10	32.63	0.19	4.71	3.35	2.85	8.35	3.19	3.26	3.14	3.06	2.03
2010-11	20.04	0.08	4.52	3.54	3.02	8.72	4.79	5.81	2.98	2.56	2.92
2011-12	15.22	0.05	4.49	2.86	3.57	13.62	3.58	6.72	2.82	2.94	3.29
2012-13	7.04	0.03	5.64	4.16	3.99	13.06	3.18	7.51	3.62	3.49	5.12
2013-14	5.70	0.02	5.25	4.42	3.65	14.22	3.19	6.73	3.58	3.13	4.98
2014-15	2.03	0.01	6.23	4.44	3.18	9.24	2.51	7.55	4.91	2.08	5.12
2015-16	3.10	0.02	8.03	6.55	3.38	10.20	2.87	6.68	5.40	2.87	6.07
2016-17	9.13	0.05	8.14	5.37	3.26	7.73	3.95	3.93	6.07	3.33	5.40
2017-18	5.64	0.03	12.74	5.22	4.25	4.74	3.44	6.97	6.09	3.26	6.13
2018-19	4.54	0.02	15.30	4.65	5.75	6.77	2.98	0.96	5.58	4.54	5.03
2019-20	8.56	0.03	12.65	4.85	4.72	2.93	3.58	1.00	6.15	6.86	5.49
2020-21	13.86	0.04	10.80	4.95	4.41	4.15	9.57	2.47	4.59	4.02	3.51
Average	**13.30**	**13.71**	**7.88**	**4.37**	**3.79**	**8.28**	**4.05**	**4.58**	**4.30**	**3.39**	**4.22**

Source: Ministry of Commerce and Trade, Department of Commerce, Export -Import Data Bank.

TABLE – 5
Estimated Indian Export Demand Functions (to BRICS Countries)

S. NO	Regression equation	R^2	F-Statistic	D. W. Statistic
	(1)	(2)	(3)	(4)
1.	Log X_1 = 66.321*+ (-1.110 log GDP BRICS)+ (-5.390*** log REE)	.410	5.865	1.221

2.	$\text{Log } X_2 = -9.779 + .474 \log \text{GDP BRICS} + .724 \log \text{REE})$	-.103	.344	.956
3.	$\text{Log } X_3 = -60.370 * + 2.258* \log \text{GDP BRICS} + (-.061 \log \text{REE})$	.822	33.302	.991
4.	$\text{Log } X_4 = -35.579* + .1.530* \log \text{GDP BRICS} + (-.777 \log \text{REE})$	.891	58.482	1.837
5.	$\text{Log } X_5 = -35.206* + 1.639* \log \text{GDP BRICS} + (-1.597 \log \text{REE})$	.526	8.756	1.185
6.	$\text{Log } X_6 = -3.984 + .448 \log \text{GDP BRICS} + (-.458 \log \text{REE})$	-1.36	.161	.866
7.	$\text{Log } X_7 = -19.258 + 1.421** \log \text{GDP BRICS} + (-3.604** \log \text{REE})$	.349	4.760	1.866
8.	$\text{Log } X_8 = -9.725 + .325 \log \text{GDP BRICS} + 1.415 \log \text{REE}$	-.127	.209	.934
9.	$\text{Log } X_9 = -53.892* + 2.055* \log \text{GDP BRICS} + (-.254 \log \text{REE})$	.943	117.527	1.750
10.	$\text{Log } X_{10} = -54.175* + 2.651* \log \text{GDP BRICS} + (-4.098* \log \text{REE})$	.821	33.204	1.275
11.	$\text{Log } X_{11} = -62.621* + 2.324* \log \text{GDP BRICS} + (-.136 \log \text{REE})$	.722	19.139	.639
12.	$\text{Log } X_{TE} = -13.368*** + 1.004* \log \text{GDP BRICS} + (-1.471 \log \text{REE})$	.481	7.488	1.465

*denotes that the Coefficients are significant at 1% level of significance.

** denotes that the Coefficients are significant at 5% level of significance.

*** denotes that the Coefficients are significant at 10% level of significance.

ANALYSIS OF PRICE COMPETITIVENESS OF INDIAN EXPORTS TO BRICS MARKETS

Table 5 presents the estimated Indian export demand functions by considering the top 11 principle commodities exported to BRICS countries along with the total commodity export demand function.

1. Export Demand Function of X_1

In the estimated equation 1, X_1 indicates the export of Ores, Slag and Ash. From the equation it is clear that, the coefficients of GDP BRICS and REE are negative and GDP BRICS Statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about 41 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 1.11 percent decrease in Indian exports to BRICS. Though, the export product is found to be price competitive, yet they are price inelastic as the coefficient is less than unity and negative.

2. Export Demand Function of X_2

in respect of X_2 Mineral Fuels and related Products. the coefficients of both variables namely GDP BRICS and REE are noticed to be positive and GDP BRICS Statistically and REE are statistically not significant. Further those two variables are observed to provide explanation for about -10.3 percent variation in the exports of X_2. Moreover, the elasticity coefficients imply that a one percent increase in income and REE would push up Indian exports to BRICS countries by about the coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of .47 percent increase in Indian exports to BRICS. Though, the export product is found to be price competitive, yet they are price inelastic as the coefficient is less than unity.

3. Export Demand Function of X_3

In case of X_3 Organic Chemicals, the fit is good and the coefficients of both variables turned out with expected signs. However, the coefficient of income is statistically significant at 1 percent, while

that of exchange rate is statistically not significant. Further, the coefficient of variables implies that a one percent increase in income would increase the Indian exports to BRICS by about 2.25 percent. Thus, Organic Chemicals are observed to be more income elastic rather price elastic.

4. Export Demand Function of X_4

The fit corresponding to X_4 i.e., Pharmaceutical Products, From the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 1 percent level of significance. While, REE is negative and statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about 89 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 1.5 percent increase in Indian exports to BRICS. Though, the export product is found to be more income elastic rather than price elastic.

5. Export Demand Function of X_5

In case of, X_5Plastic and Rubber related Products, From the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 1 percent level of significance. While, REE is negative and statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about 53 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 1.6 percent increase in Indian exports to BRICS. Though, the export product is found to be more income elastic rather than price elastic.

6. Export Demand Function of X_6

The fit corresponding to X_6 Cotton, from the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically not significant. While, REE is negative and statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about -13 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of .44 percent increase in Indian exports to BRICS. Though, the export product is found to be more income elastic rather than price elastic.

7. Export Demand Function of X_7

Corresponding to X_7Iron and Steel and related articles, from the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 5 percent level of significance. While, REE is negative and statistically significant at 5 percent level of significance. Further based on the value of R^2, the two variables included in the regression model explain about 35 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 1.42 percent increase in Indian exports to BRICS. Though, the export product is found to be income elastic rather than price elastic.

8. Export Demand Function of X_8

In respect of X_8Copper and Articles, from the equation it is clear that, the coefficients of GDP BRICS and REE are positive and Statistically not significant. Further based on the value of R^2,the two variables included in the regression model explain about -12 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of .32 percent increase in Indian exports to BRICS. Though, the export product is found to be more price elastic rather than income elastic.

9. Export Demand Function of X_9

Corresponding to X_9Nuclear Reactors, Boilers, Machinery and Mechanical Appliances, from the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 1 percent level of significance. While, REE is negative and statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about 94 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 2.05 percent increase in Indian exports to BRICS. Though, the export product is found to be more income elastic rather than price elastic.

10. Export Demand Function of X_{10}

Corresponding to X_{10}Electrical Machinery and related Equipment, from the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 1 percent level of significance. While, REE is negative and statistically significant at 1 percent level of significance. Further based on the value of R^2, the two variables included in the regression model explain about 82 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 2.65 percent increase in Indian exports to BRICS. Though, the export product is found to be more price elastic negatively rather than income elastic.

11. Export Demand Function of X_{11}

In respect of X_{11}Motor Vehicles and Accessories, from the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 1 percent level of significance. While, REE is negative and statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about 72 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 2.32 percent increase in Indian exports to BRICS. Though, the export product is found to be more income elastic rather than price elastic.

12. Export Demand Function of X_{12}

Corresponding to X_{12} i.e., Total Exports to BRICS, from the equation it is clear that, the coefficient of GDP BRICS is positive and Statistically significant at 1 percent level of significance. While, REE is negative and statistically not significant. Further based on the value of R^2, the two variables included in the regression model explain about 48 percent variation in Indian exports. The coefficients of the variables imply that, a one percent increase in GDP BRICS (income) result in an increase of 1.004 percent increase in Indian exports to BRICS. Though, the export product is found to be price elastic less than unity rather than income elastic.

SUMMARY

India's total exports during the study period are observed to increase 4.49 percent per annum, while total imports are found to increase at 3.95 percent per annum. Thus total export import gap has been decreasing at 0.54percent points, indicating an average gap (deficit) US $ 132016.8 million over the study period. The share of exports to BRICS countries varied between 3.66 and 6.45per cent, while the share of imports from BRICS countries in total Indian imports accounted for 12.57 per cent to 20.90 percent.

Average Indian commodity exports are observed to be highest to China (about US $ 13318.16 million) followed by Brazil (about US $ 3768 million), South Africa (about US $ 3742 million) and Russia (about US $ 1840 million) in the order. During the study period among the BRICS countries, average Indian commodity imports are found to be highest from China (about US $ 51373 million) followed by South Africa (about US $ 6444 million), Russia (about US $ 4710 million) and Brazil (about US $ 3499 million) in the order. Regarding India's export of top eleven commodities to BRICS markets in terms of percentage. During the study period, among the different commodities that are exported by India to BRICS markets, Mineral fuels and related products (X_2) topped the list with an average share of 13.71 percent followed by, Ores, Slag and Ash (X_1) with an average share of 13.30 percent, Cotton (X_6) with an average share of 8.28 percent, Organic Chemicals (X_3) with an average share of 7.88 percent, Copper and Articles (X_8) with an average share of 4.58 percent, Pharmaceutical Products (X_4) with an average share of 4.37 percent, Nuclear reactors, Boilers etc (X_9) with an average share of 4.30 percent, motor vehicles and accessories (X_{11}) with an average share of 4.22 percent , Iron and steel and related articles (X_7) with an average share of 4.05 percent, Electrical machinery and related equipment (X_{10}) with an average share of 3.99 percent, Plastic and Rubber Products (X_5) with an average share of 3.79 percent respectively. The average share of the top eleven commodities considered for the study is noticed to be about 71.87 percent in the total commodity exports of India to BRICS markets.

The regression analysis implies that in respect of all commodity and principal commodity exports of India to BRICS markets, the coefficients of GDP BRICS are positive and found to be statistically significant at 1 percent level in respect of 7 out of 12 equations estimated. Thus, income of BRICS countries is said to significant variable effecting Indian exports to BRICS markets. Further the coefficients of REE are observed to be statistically significant in case of 3 out of 12 equations and 10 coefficients are negative and remaining 2 are positive it implying that price competitiveness is less for Indian exports to BRICS markets. Further, exports of X_8 isfound to be relatively more price elastic. Thus, the analysis clearly implies that, Indian exports to BRICS are more income elastic rather price elastic.

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