Determinants of Export, Import and Total Trade of Indian Iron and Steel Industry

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ABSTRACT: Iron and Steel are vital ingredients for the smooth living of people of any country. There is increasing demand for iron and steel for any country that is developing. India ranks third in the production of crude steel and is the third largest consumer of finished steel. Steel, as it is very essential has bagged this position. Steel is recyclable, durable and is also strong. The contribution of the sector (steel) to the economy is over two-thirds of the country's GDP and utilises about twenty five lakh tonnes of steel in steel and allied sectors. Between 2008 and 2011, the country (India) has recorded a growth of 29. 2 per cent in steel production. But, India consumes only a small portion of the steel as compared to other Asian countries like China, China, Japan and Korea. Iron and Steel Exports amounted to 7.606 million tonnes (52.9 per cent growth in comparison to 2016), whereas the imports 6.097 million tonnes (10.9% growth in comparison to 2016).

Current study focuses on factors determining Export, Import and Total Trade of Iron and Steel in India.

Keywords: Iron, Steel, Export, Import, Total Trade

I. INTRODUCTION

India, being the world's second-largest manufacturer of steel, its production in 2019 stood at 111.2 million tonnes (MT). this growth can be attributed to domestic availability of raw materials like iron ore and cost-effective labour. Therefore, the steel sector contributes to India's production output.

The Indian steel industry is modern with state-of-the-art steel mills. It has always strived for continuous modernisation of older plants and up-gradation to higher energy efficiency levels. Asif Pervez (2015) Indian steel industry is classified into three categories - major producers, main producers and secondary producers.

Increasing urbanisation and the demand for Iron and steel in the manufacturing and construction sectors, the sector has increased its production, export and import, thus contributing significantly to the GDP.

II. REVIEW OF LITERATURE

According to Dr.ManMohan Singh (2007) the government would do the necessary to ensure that the iron and steel industry is able to meet the growing demand for steel and called upon Indian steel tycoons seeking global opportunities to pay equal attention to the market opportunities within India. It is investing It is investing about 34 per cent of the country's GNP in all production activities, out of which around 50 per cent happens to be in construction. 34 per cent of the country's GNP in all production activities, out of which around 50 per cent happens to be in construction. He also pointed out that the increasing number of global steel majors who have announced plans to set up steel making facilities in India gives a fair indication of the competitive advantages of making steel in the country.

Kamath (2007)analyzed whether the import dependence of the industrial sector had increased in the post liberalisation period, when compared to that in the pre liberalisation period for select industries for the reference period from 1985-86 to 2004-05. It was clearly observed that the import dependence had in general increased, but the results varied immensely across industries. For textiles and leather industries though the net Foreign Inflow Rate (NFIR) was positive, the impact of liberalisation had resulted in increase in the import dependence. There was an impact of policy changes in the import dependence for machinery and transport equipment, however NFIR continued to be fluctuating and negative. In case of sugar industry there was no consistency in the behaviour. As in case of machine tools, the import dependence was seen to be increasing clearly after the reforms.

Mr. S.K.Roongta and Mr.Muthurman (2008) said that the major two companies in India have embarked on major capacity expansions to ramp up production capacities. They aim at increasing the output to 26 million tones at a cost of more than Rs. 50,000 crore.

Yadav (2015) highlighted the industry has grown manifold after studying the performance of Iron and Steel industry – its production, consumption , import and export.

According to Pal (2013), India's potential to top the world in steel production was highlighted. Burange& Yamini (2010) analyzed the performance of selected firms in Indian Iron and steel industry in pre & post liberalization periods and found that the industry was mostly dominated by Tisco while SAIL had a greater market share.

III. RESEARCH METHODOLOGY
Data Source: Secondary sources
Period of study: 1995-2017
Tools of analysis:
Stochastic Frontier, Maximum Likelyhood Method

IV. RESULTS AND DISCUSSION
Determinants of Export, Import and Total Trade

Before an effort was undertaken to examine the determinants of export, import and total trade in the Iron and Steel trade in India nature of relationship (closeness) based on Karl Pearson two-tailed correlation matrix was formed. The dependent variables are export, import and total trade and independent variables were GDP, FDI, Inflation and Indirect Tax. Table-1depicts the export correlation matrix

Table-1 Export Correlation Matrix

		EXPORT	GDP	FDI	INFLATION	IT
EXPORT	Pearson's Correlation	1	.968[**]	.921[**]	.968[**]	.941[**]
	Sig. (2-tailed)		.000	.000	.000	.000
	N	26	26	26	26	26
GDP	Pearson Correlation	.968[**]	1	.946[**]	1.000[**]	.979[**]
	Sig. (2-tailed)	.000		.000	.000	.000
	N	26	26	26	26	26
FDI	Pearson Correlation	.921[**]	.946[**]	1	.946[**]	.950[**]
	Sig. (2-tailed)	.000	.000		.000	.000
	N	26	26	26	26	26
INFLATION	Pearson Correlation	.968[**]	1.000[**]	.946[**]	1	.979[**]
	Sig. (2-tailed)	.000	.000	.000		.000
	N	26	26	26	26	26
IT	Pearson Correlation	.941[**]	.979[**]	.950[**]	.979[**]	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	26	26	26	26	26
**. Correlation is significant at the 0.01 level (2-tailed).						

Foot Note:*Significant at 1 percent level.   **Significant at 5 percent level

There is a significant association between export and the related variables at one and five percent significance level ranging between 0.921 and 1.000. the magnitude of the association between the variables was assessed with stepwise regression model in the table 2 below.

TABLE – 2 Export Determinants

Model	b_0 (constant)	Independent Variables				R^2	F-statistic
		a_1 (GDP)	a_2 (FDI)	a_3 (INF)	a_4 (IT)		
I	-2.160* (-10.162)			2.049* (23.091)		.983	533.175*
II	-3.934* (-4.091)	1.141* (4.019)	.338* (4.012)			.971	146.475*
III	-3.786* (-6.413)	.649* (3.319)	.005 (.069)	1.494* (5.555)		.990	269.934*
IV	-3.726* (-6.502)	.778* (3.726)	.050 (.602)	.201 (.219)	.677 (1.464)	.991	216.584*

Source: Calculations were based on WTO statistical data base and Statistical Handbook of India

Foot Note:*Significant at 1 percent level.   **Significant at 5 percent level

Model 1: Considering export as the dependent variable, a unit change in inflation brought about three units of change in the export of Iron and Steel.

From model II, the regression of export on GDP was computed as 1.141. This is statistically significant at one per cent level.

Model III – This model explains when GDP, FDI and Inflation were combined, GDP showed elasticity at 0.649 units and other two variables were positively related with export.

Model IV—The variables, (GDP,FDI, Inflation (INF) and Indirect tax (IT) are positively related to the export of Iron and Steel in India.

The fit was good based on F statistic for all the models. The r2 value showed more than 90 percent change in three out of four models. In conclusion, it can be said that GDP is a factor that determines the export performance of iron and steel industry in India during the referenc3e period under study. Table 3showsfacts on import correlation matrix

TABLE –3 Import Correlation Matrix

		Import	GDP	FDI	IT	INFLATION
Import	Pearson Correlation	1	0.959**	0.914**	0.928**	0.958**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	22	22	22	22	22
GDP	Pearson Correlation	0.959**	1	0.946**	0.979**	1.000**
	Sig. (2-tailed)	0.000		0.000	0.000	0.007
	N	22	22	22	22	22
FDI	Pearson Correlation	0.914**	0.946**	1	0.950**	0.946**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	22	22	22	22	22
IT	Pearson Correlation	0.928*	0.979**	0.950**	1	0.979 *
	Sig. (2-tailed)	0.000	0.000	0.000		0.014
	N	22	22	22	22	22
INF	Pearson Correlation	0.958**	1.000**	0.946**	0.979*	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	22	22	22	22	22

Foot Note:*Significant at 1 percent level.   **Significant at 5 percent level

The relationship between import and related variables in the Iron and Steel industry of India were significant either at one percent or at five percent significant level, ranging between

0.914 and 1.000the magnitude of the association between the variables was assessed with stepwise regression model in the table 4.

TABLE - 4 DETERMINANTS OF IMPORT

Model	b_0(constant)	Independent Variables				R^2	F-statistic
		b_1 (GDP)	b_2 (FDI)	b_3 (INF)	b_4 (IT)		
I	-2.739* (-9.999)			2.299* (20.098)		.977	403.915*
II	-4.683* (-4.384)	1.259* (3.991)	.391* (4.173)			.972	151.351*
III	-4.538* (-5.861)	.775** (3.023)	.064 (.613)	1.468* (4.163)		.986	198.221*
IV	-4.463* (-5.896)	.935* (3.388)	.118 (1.087)	-.130 (-.107)	.838 (1.370)	.987	156.804*

Source: Calculations were based on WTO statistical data base and Statistical Handbook of India
Foot Note:*Significant at 1 percent level.   **Significant at 5 percent level

Model I Import, the dependent variable was regressed on the variables GDP, FDI, Inflation and Indirect tax. The co-efficient showed a high amount of elasticity of over 3 units on inflation.
Model II and III A change over one unit was seen in import due a change in GDP. Inflation was seen to be positively related to GDP, the elasticity co-efficient was moderate (0.935). This was statistically significant at five per cent level. All the four models fit, I,II,III and IV were good based on the F Statistic.

TABLE –5 CORRELATION MATRIX OF RELATED VARIALES OF TOTAL TRADE

		Total Trade	GDP	FDI	IT	INF
Export	Pearson Correlation	1	0.963**	0.918**	0.933**	0.963**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	22	22	22	22	
GDP	Pearson Correlation	0.963**	1	0.946**	0.979**	1.000**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	22	22	22	22	22
FDI	Pearson Correlation	0.918**	0.946**	1	0.950**	0.946**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	22	22	22	22	
IT	Pearson Correlation	0.933*	0.979**	0.950**	1	0.979*
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	22	22	22	22	22
INF	Pearson Correlation	0.963**	0.979**	0.950**	0.979*	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	22	22	22	22	22

Foot Note:*Significant at 1 percent level.   **Significant at 5 percent level

The association between total trade and related variables are significant at one and five per cent level, ranging between 0.918 and 0.979. the extent of the relationship was assessed based on step-wise regression model, shown in table -6, below.

TABLE –6 DETERMINANTS OF TOTAL TRADE

Model	b_0 (constant)	Independent Variables				R^2	F-statistic
		a_1 (GDP)	a_2 (FDI)	a_3 (INF)	a_4 (IT)		
I	-2.452* (-10.119)			2.175* (21.499)		.980*	462.221*
II	-4.311* (-4.282)	1.200* (4.036)	.365* (4.139)			.972*	151.769*
III	-4.165* (-6.146)	.714** (3.182)	.037^{NS} (.405)	1.474* 94.776)		.988*	231.390*
IV	-4.097* (-6.213)	.860* (3.577)	.087^{NS} (.913)	.019^{NS} (.018)	.763^{NS} (1.432)	.989*	184.784*

Source: Calculations were based on WTO statistical database and Statistical   Handbook of India*Significant at 1 percent level.   **Significant at 5 percent level^{NS} Not Significant

While considering total trade as the dependent variable, only, GDP was seen to be determining the total trade. All the independent variables show a positive association with total trade. Inflation, again, depicted a high elasticity (co-efficient 3.024).

The hypothesis framed as **"There is no significant relationship between trade and some important parameters in pharmaceutical industry trade as determinants"** was rejected and the alternative hypothesis was accepted.

Details regarding trade openness (export and import as a percentage of GDP) and trade balance in terms of GDP of pharmaceutical industry of India during the particular reference period were calculated and it is reported in Table-7

TABLE –7 TRENDS IN TRADE BALANCE AND TRADE OPENNESS

Year	Trade balance	Trade openness
1995	-0.02	8.02
1996	-0.01	7.37
1997	-0.01	7.78
1998	-0.01	5.30
1999	0.02	5.13
2000	0.01	5.39
2001	0.01	4.60
2002	0.02	6.13
2003	0.03	8.52
2004	0.04	12.62
2005	0.02	17.60
2006	0.02	20.30
2007	-0.01	24.97
2008	0.02	30.25
2009	-0.01	19.40
2010	0.01	24.96
2011	-0.01	24.89
2012	0.01	23.77
2013	0.03	20.36
2014	0.02	20.35
2015	-0.02	16.27
2016	0.01	18.45
2017	0.02	20.38

Footnote: Calculations are based on WTO statistical data base.

Real trade balance calculated taking account GDP (export and import divided by GDP) pointed out that there were positive trade balances, ranging between 0.01 percent and 0.04 percent during the above-mentioned years. This implied a trade surplus, that could have been due to the excess production, earlier. This shows that borrowing from external sources to pay for the imports may not be required.

V. CONCLUSION

Although the threat forIron and Steel imports have significantly increased, Indian iron and steel companies have invested a lot in refashioning and expanding their prevailing units. They also are improvising by being conscious about the environment and create an eco-friendly and environment friendly plant to make best, efficient and cost effective industry with a lot of social responsibilities. The industry not only is stressing on increasing its global competency,the industry is focussing on improving the export of steel to increase its profits. The Government extended its support by initiating National Steel Policy 2017, which set out a way to enhance the growth of the economy for the demand as well as the supply sectors of the Indian Steel Industry 2030-31.

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