Fishery Sector Trade: An Analysis of Price Competitiveness & Productivity

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Abstract

The paper focuses is to explain the competitiveness of India's fishery sector exports in the back ground of classical and neoclassical theories of comparative cost advantage highlighting the importance of productivity. The classical school attributes the differences in productivity to difference in production function whereas the neoclassical school highlighted the importance of difference in factor endowment. The Heckscher-Ohlin theory establishes a distinctive relation between factor prices, commodity prices and factor intensities to explain the comparative cost advantage in trade. Thus, both the classical and neo-classical theories typically analyzed the importance of relative price in international trade along with its correlation to factor prices and productivities (Bhagwathi, 1964). This logically follows that export prices and competitiveness are closely related and which in turn depends on the price and productivity of inputs. Hence both the price competitiveness and productivity has been analysed.

Key words: Competitiveness, Price Competitiveness, Unit Price Export Price Index, Unit Price Index, Total Factor Productivity, Labour productivity, Capital productivity

1. Introduction

The trade literature highlights the importance of competitiveness, but there is no consensus among researchers to analyze it with a common indicator. But the appropriate definition and measure of competitiveness depends on the research question (Ketels, 2006). Without competitiveness the survival of the firm and the industry itself is questionable. Competitiveness perspective echoes in price, cost, productivity and other technology indicators (Yap, 2004). The country's price competitiveness matters as the advantageous factor in explaining the demand for export for any commodity. India's fishery sector specific characteristic is not only to meet quality and safety standards but also to supply commodities at competitive price to meet the demands of the world trading system in comparison with its competitors.

Given this background, though competitiveness[1] squeezes newer facets like the quality of the product, the standard norms set as product and process standards etc., price competitiveness keeps a dominant hold. In an

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[1]Porter (1980) identifies competition in terms of five driving factors –(i) the threat of entry (ii) threat of rivalry (iii) the threat of substitutes (iv) threat of suppliers and (v) the threat of buyers. Here, an extensive use of Game theory modeling is required to analyze the dynamism involved.

imperfectly competitive market the decision of a firm influences the trading behavior of its competitor and thus giving importance for price. It is hypothesized that India's fishery sector exports are differentiated products in the world market. This has prompted to see the price competitiveness of India with its competitors in the case of fishery sector products. Along with price competitiveness the productivity of India's fishery sector has also been analyzed because the advantage of productivity may reflect in price.

1.1 Price Competitiveness: Concept and Measurement

"Competitiveness in the sense of market share may rise or fall as a result of an increase in a country's relative prices, depending upon whether the elasticity of substitution between it's exports and that of other countries is less or more than one"(Kravis & Lipsey, 1971). Geehan (1968) argued that price has an important influence to explain competitiveness. Price has been accepted as the premeditated variable also in Bertrand's competitive equilibrium condition. In the competitive process, Bertrand's strategy is to set a price below competitor's price (Qin & Stuart, 1997) . The competitiveness of an industry having the ability to export can be measured by relative price ie., price differential in the domestic market viz-a-viz international price, the total factor productivity etc (Chaudhuri & Ray, 1997). Paul & Mote (1970) argued that a comparison of domestic price with export price is irrelevant for the reasons underlined by economic theory. Productivity, competitiveness and growth are though causally interrelated, but should be seen distinguished from one another. Moreover, in international trade prices, factor productivity advantages determine competitiveness (Papadakis, 1996).

Though it is highly controversial and difficult to arrive at a definite figure to explain the competitiveness of a product, price has been accepted to be the prime contributor. Competitiveness is multidimensional and price is taken as an index because it impugns all the attributes (Schott 2004)[2]. Theoretical and empirical evidence establishes that price has an important role to play in international trade to retain the competitiveness' of a product. The most celebrated relative price approach is usually depended to analyze the comparative competitive export price changes. This theoretical reasoning has been supported by the empirical findings of (Helen & Rhomberg, 1964) that 43 percent of the variation in export shares is due to relative export price changes. Parkinson (1966) made a similar finding that there is a positive alliance between price and export performance. (Feenstra, 1994) developed a price index in the framework of CES incorporates new product varieties along with taste or quality change in existing varieties, thus measuring the price index implies competitiveness. Relative

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[2](Schott, 2004) analyzed product-level US import data unit values within products and inferred that it vary systematically with exporter relative factor endowments and exporter production techniques. The author observed three patterns from the data – (i) unit values are higher for varieties originating in capital and skill-abundant countries than they are for varieties sourced from labor-abundant countries (ii) Unit values are positively associated with the capital intensity of the production technique exporters used to produce (iii) overtime skill and capital deepening countries experience an increase in unit values relative to countries they leave behind. The relationship between unit values, exporter endowment and exporter production techniques supports the view that capital and skill abundant countries use their endowment advantage to produce vertically superior varieties; ie., varieties that are relatively capital or skill intensive and posses added features or higher quality, thereby commanding a relatively higher price.

Export Price Index (REP)[3] can be used to measure competitiveness is well recognized (Doggett & Creswell, 1979).

Relative Export Price Index[4] of a country is the ratio of the unit value index of exports of that country to a weighted average of unit price index of exports of its competitors (Bhatt, 2008). The weight assigned to each competitior to substitute in the formula for calculating the Relative Export Price Index is given below:

$$W_j = \sum_K Xik \ Yjk \dots\dots\dots\dots\dots\dots (1)$$

Where W_j is the weight of the jth country. Xik is the export share of India to the Kth country. Yjk is the share of jth country to the kth country in the total export of all countries.

1.2 Theoretical Reasoning

The importance of competitiveness as one of the determining factor in trade is itself cited by Adam Smith (1776) with his theory of absolute cost advantage over its competitors. Ricardo propaganded the same ideology with his concept of comparative cost advantage and difference in labour productivity[5] as the yardstick. The differences in factor endowments as explained by Heckscher – Ohlin (1919) explains trade competitiveness to switch over to the production of those commodities having low production cost because of factor abundance.

The concept of productivity, efficiency in production is an expression of output input ratio. But regarding the measurement of productivity, there is a difference as two producers has different labor productivity levels even with same production technology if one is more capital intensive. Thus researchers make use of a concept of productivity which is invariant to the intensity of use of observable factor inputs, the total factor productivity or multifactor productivity. It shifts the isoquants of a production function (Syverson, 2011). It is understood from the above discussion that productivity growth is necessary not only to increase output, but also to enhance the competitiveness both in the national and international market. Dollar and Wolff (1993) and Bernard and Jensen (1999) argued that relative productivity growth positively influences and brings about drastic changes in revealed comparative advantage and the firms become more export competitive. Thus estimation of factor productivity will be very useful to evaluate the performance of the India's fishery trade industry over a period of time.

1.3 The Tradeoff between Price Competitiveness and Productivity

Though competitiveness in ordinary parlance means ability to compete, but our research mainly focus on the post facto performance data to measure competitiveness of the fishery industry as a whole. World Economic Forum

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[3] The relative export price index of a country below 100 indicates relatively more competitiveness of exports compared to its competitors and above 100 indicates less competitiveness of imports.

[4] It is the ratio of the unit value index of India's exports to the weighted average of the unit value index of its competitors.

[5] "Labour productivity may be separated into (i) a deterministic component, which is industry and country specific and (ii) a stochastic component, randomly drawn across countries, industries and varieties. The former, which we refer to as "fundamental productivity", captures factors such as climate, infrastructure, and institutions that affect the productivity of all producers in a given country and industry. The latter, by contrast, reflects idiosyncratic differences in technological know-how across varieties" (Costinot & Donaldson, 2012)

defines competitiveness as the 'set of institutions, policies, and factors that determine the level of productivity of a country' (Schwab, 2014). Thus drawing implications on competitiveness by taking productivity as an indicator is justified. A nation's standard of living is determined by the productivity of its economy, which in turn is measured by the values of goods and services produced per unit of the nation's human capital and natural resources (Porter and Ketels, 2003). It is hypothesized that as the economy becomes more open the competitive pressures with technological efficiency lead to productivity gains and restructures the economy towards its comparative advantage (Batra and Khan, 2005). This is the basic idea behind the hypothesis of export led growth[6] and researchers tested it based on general production function with export as an additional argument, Y=f(L,K,X) where Y is gross output, L and K are labour and capital inputs and X, the level of exports.

The role of each factor is instrumental to bring structural change in any industry and especially to one that succumbs to international repercussions to increase the per capita real output. This requires the rise in labor productivity which expects the wage to rise with a due care and concern that there should not be marked rise in prices.

Price is primarily a function of three factors such as capital intensity (ie., capital/worker), labor productivity and wage. If the ratio of capital intensity to labor productivity exceeds a certain limit, it is likely that prices will rise (ESRF, 1968). Wage rates are expected to move in tune or lesser productivity rise, to keep the price not to move upward. The relationship between prices, distinctively influenced by capital intensity and labor productivity may be expressed as

$$\text{Prices } \alpha \ \frac{Capital\ intensity}{Labour\ Productivity} \quad \dots\dots\dots\dots\dots(2)$$

The reasoning behind it is that prices are pertinent to keep the same trend in proportion to capital intensity (ci) and indirectly or inversely in proportion to labor productivity (lp).

The influence of wages on prices are governed by factors outside the control of industry, since in most industries wages are linked with the cost of living Index which is influenced by food rather than industrial prices. The wage rates are not as a rule governed by labor productivity. Thus the relationship between wages and prices can be expressed as

$$\text{Prices } \alpha \ \frac{wages}{Productivity} \quad \dots\dots\dots\dots\dots(3)$$

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[6] Theoretical argument for export – led growth has its footing in the Neo Classical economists after the successful story of Newly Industrialized countries Hongkong (China), Taiwan, Singapore and the Republic of Korea-the four tigers in successfully achieving sustained economic growth because of free market and out ward orientation policies(Chaudhary, Shirazi, & Choudhary, 2007) and (World Bank, 1993) but the reality of success explains an interventionist state.

The third equation implies that, in the case where wages rise, prices will keep on increasing unless accompanied by an increase in productivity. Thus, it may be presumed that productivity increase led to a decline in the price, which in turn could be one of the factors for the price to be internationally competitive.

1.4 India's Price Competitiveness VIS-À-VIS major Trading Partners.

The direction of India's fishery sector trade is more focused towards the developed world and less with developing countries. The constraints stick more with this developed world in the form of trade standards. The more the market is competitive; the efficiency of the firm to compete depends on price. The technological efficiency of the sector has to improve to be competent to retain in the international market. Thus the concept of competitiveness varies at different levels and both price and non price factors are important. Since these issues persist, it draws attention to see price competitiveness of India in these countries against its competitors. In the methodology of relative approach, price competitiveness of a commodity exported from a particular country to a particular destination will be compared with its own competitors having the same export destination for the same product.

The objective has been addressed by taking our major three trade partners - EU as a group, USA and Japan. Thus the study examined the price competitiveness of India in the EU, USA and Japan markets in comparison with world competitors like Canada, China, Denmark, Spain, Norway, USA and Vietnam. Hence, those categories of products which have been more stable in the market constitute the product group for the analysis. The comparatively lesser export price with respect to its competitors shows that India has a price advantage in the international market.

2. Method of Analysis, Variable Description & Data Source.

Data Source:

The data collected to carry out the analysis of price competitiveness with world potential competitors in fishery exports is from UN Comtrade data base downloaded through WITS for the period 1995-2014. The data has been collected at 6-digit level of disaggregation.

The dataset to analyze the partial and total factor productivity is from Annual Survey of Industries published by the Central Statistical Organization of India. The relevant deflators have been basically collected from the Officer of the Economic Advisor, Ministry of Statistics and Planning. The entire analysis has been over the period 1980-2013. Since ASI provides data for the financial year and all the series are in nominal terms, it has been converted into real terms with appropriate price indices.

2.1 Variable Description:

The variables used for the analysis are the relative price (in $) derived from exports and imports[7] of the commodity traded. The 6 digit level data provides the value and quantity figures of export import data separately based on HS Commodity Code[8]. From these figures price data has been derived by taking unit value as the proxy variable. The unit value hereafter called price variable is used to construct the relative price ratio. The relative price ratio is a measure of India's price competitiveness. It is a derived variable; it is the actual export price of India to the import price of the destination country after deducting the value of products imported from India and the quantities as well. Thus, deriving the importer's price. The ratio of these two figures gives the competitive price.

Three variables have been selected for the partial and total factor productivity analysis: output, labor input and capital input.

Output: The output data is measured both in physical and value terms depending on the source from which it is accessed. The physical measurement of output hides the effect of qualitative differences and therefore, the preference is for money value of output. Hence the gross value added output is accessed from Annual Survey of Industries. This Gross value added output as available in monetary value has been deflated using the whole sale price index of the weighted average of marine and inland fish.

Labor Input: Labor input is measured by either the total number of persons engaged or with regard to the number of man-hours worked. But the data based on this nature is not advisable to compare with capital productivity which is in monetary units. Thus the labor input is taken in money terms and is the aggregate of wages and salaries and other benefits given to all the employees. The figure thus generated has thus been deflated to the consumers price index, thus make a real variable.

Capital Measured: The construction of the variable capital[9] is based on the Perpetual Inventory Method, Goldar (1983) and the data source being Annual Survey of Industries. Gross fixed assets at constant prices have been taken as the measure of capital input. Let C_t denote the book value of fixed assets at the end of the year t, Dt is depreciation allowance for the year and It, the real gross investment for the year may be defined as

$$It = (C_{t} - C_{t-1} + D_{t})/Pt \qquad \ldots\ldots\ldots\ldots.(4)$$

Pt is the capital goods deflator. Pt is the whole sale price index of machine tools for the fish processing sector. Subsequently, the capital stock series is computed using the following relationship,

$$Kt = It + (1-\delta)Kt_{-1} \ldots\ldots\ldots\ldots..(5)$$

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[7] The relevant world market prices are those a country faces in foreign trade, it is c.i.f. prices for actual and potential imports and f.o.b. prices for exports.

[8] The product description of the H S commodity codes considered for the analysis is attached in the appendix B

[9] Subject to the non availability of the data source that the capital used or the machinery available is domestically produced or imported.

Where Kt is the capital stock at the end of the year t, It is the investment done during t and δ is the rate of replacement, which is assumed as 5 percent.

2.2 Method of Analysis

(i) Analyzing Price Competitiveness: Usually, a relative approach is depended to assess the price competitiveness i.e., 'the relative method' analyzing the changes in export prices relative to its competitors (Geehan, 1968). It has been used as a tool to point out the competitive price and the range at which it is put up for sale by the potential competitors. Thus, the relative competitive strength of the product in comparison to its competitor is assessed. Trade theory edifies the importance of relative price as determining factors of industrial specialization and welfare gains due to trade openness (Gaulier, Julien, Mejean, & Soledad, 2010) .The main competitors of India considered in this chapter are the top ten fishery sector products exporting countries like China, Canada, Denmark, Spain, Norway, USA, Vietnam and the trade partners considered are USA, Japan and EU.

The index of price competitiveness is defined as the ratio of India's unit value divided by the unit value of its competitor. The ratio takes values more than 1 implies that India lacks price competitiveness. A decline in the value of the index implies an improvement of India's price competitiveness. A comparison of India's price competitiveness with other competitor's will account for India's performance in fishery sector exports. Hence, an inter-temporal analysis of price competitiveness for India as well as among world potential competitors is carried out.

Symbolically we can express as

Exports from India to global market as $E(X_i^j)$ where E: exports i:1…..m, the number of countries. Thus, it may be written as

$$E(X_1^j)……………, E(X_m^j) \qquad (2)$$

Assuming, (X^j) as uniform commodity is being traded, the unit cost or price, may be expressed as

$$P(X_1^j)……………, P(X_m^j) \qquad (3)$$

It is assumed that each country is a competitor of the other. Then, country m is price competitive if

$$P(X_m^j) < P(X_i^j) , \forall\ i \neq m \quad \rightarrow X^j : \textbf{uniform quality} \qquad (4)$$

Thus India's competitive performance in this study with respect to price may be analyzed in two perspectives (i) a country wise analysis and (ii) a commodity wise analysis. The An aggregate approach in which the performance is judged against a block of countries – EU, USA, Japan of selected product groups at 6 digit level has been taken up and the results are presented in Tables A3.1 to A3.15 and in the Appendix 3A. The overall trend of price is

understood by taking the average and because of the scale invariant properties, the coefficient of variation has also been calculated and furnished in the tables 3.1 to 3.15. The competitive price of a country below unity of a country indicates price competitiveness and is compared against its competitors. This distinctively reflects the extent of India's platform in the world fishery trade market.

(ii) Analysing Productivity Trends in Indian Fishery Industry: 1980-2013

Relying on quantitative analysis, the trends of the major variables has been described and the reported based on of the growth accounting exercises. The simple production function model in Cobb-Douglas form hypothetically attached to constant returns to scale developed in this section provides the framework for the analysis. The time trend of the key variables - the output capital (Y/K) ratio, capital intensity (K/L) ratio and the output labor ratio (Y/L) has been calculated.

Partial factor productivities like labor productivity, capital productivity etc fails to take into account of overall productivity changes. Hence, total factor productivity indices have been used to arrive at the productivity estimates of India's fish processing industry. Kendrick (1961) constructed an index by giving due weights to the inputs used. Either relative price or factor shares are given as weights[10]. The total factor productivity index as elucidated by Kendrick is

$\text{TFP}_t = Y/woL + roK$ ……………….(5)

Where Y: total output in the year t, w_o and r_o refers to the weights assigned and the weights assigned here being the returns to labor (L) and returns to the capital (K) respectively.

On corollary with the Kendrick index, Solow (1957) developed an index of total factor productivity based on Cobb – Douglas production function keeping hold of the assumptions constant returns to scale and competitive equilibrium. Thus total factor productivity growth is given by

$$\frac{\Delta A}{A} = \frac{\Delta Y}{Y} - b\frac{\Delta k}{k} \quad ………………….(6)$$

Where $\frac{\Delta A}{A}$, $\frac{\Delta Y}{Y}$, $\frac{\Delta k}{k}$ and b are the total factor productivity, labor productivity, capital labor ratio and b the income share of capital. After computing the growth rate in total factor productivity, Solow index of TFP is obtained using the following identity.

$$A_{t+1} = A_t (1 + \frac{\Delta A}{A}) \quad ……………….(7)$$

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[10] Assigning due weight is a real problem. Harris and Phillips (1984) has given weights exogenously. Other studies like Green (1983) has calculated and assigned weights statistically.

These two indices have been quite often used in empirical research to analyze the trends in the growth rate of productivity. The use of these two indices is to take care of the bias of one index over another[11]

3. Making a Price Comparison: Trends in India's Price Competitiveness in Fishery Sector Exports

3.1 Price Competitiveness with the trade Partner EU: A Comparison with Competitors

Taking equation (4) as base, the analysis of price competitiveness has been carried out for the most frequent traded items which India trades with EU[12] countries. The intra and inter temporal analysis of price competitiveness for each country and product considered in the case of EU countries are furnished in the appendix 3A, tables A3.1to A3.5 with the average and coefficient of variation in tables 3.1to 3.5.

Table 3.1 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: European Union Commodity Code : HS 030611							
Period: 1995-2014	India	Canada	China	Denmark	Spain	Norway	USA	Vietnam
Average	0.47	0.83	0.24	1.40	0.92	0.86	0.96	1.03
Standard Deviation	0.32	0.60	0.17	0.65	0.12	0.59	0.22	0.53
Coefficient of Variation	69.34	72.45	70.41	46.23	13.09	67.86	22.78	51.85

Source: Author's Calculation

Table 3.2 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: European Union Commodity Code : HS 030612							
	India	Canada	Denmark	Norway	Spain	US	China
Average	0.56	0.79	1.27	1.04	1.11	1.25	0.40
SD	0.28	0.21	0.24	0.42	0.67	0.18	0.09
CV	50.46	26.60	19.14	40.09	60.00	14.62	21.35

Source: Author's Calculation

Table 3.3 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: EU Commodity Code : HS 030613							
Period: 1995-2014	India	Canada	China	Denmark	Norway	Spain	Tailand	USA
Average	0.88	0.53	0.68	0.66	0.72	1.26	1.26	1.35
SD	0.13	0.13	0.08	0.09	0.19	0.25	0.21	0.42
CV	14.84	24.39	11.36	13.14	27.13	19.91	17.05	31.27

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[11] Kendrick index computes Total Factor Productivity at level Variables whereas Solow Index computes the growth rate of Total Factor Productivity.

[12] It is found from the same exercise with regard to USA and Japan that these countries though frequently import from India, the data to make a comparative study with regard to its competitors is lacking. Thus the product group and countries considered may not match in three countries. A major problem in analyzing price competitiveness with regard to USA and Japan is that comparable data on the same commodity group with respect to these countries are not available for all the time points.

Source: Author's Calculation

Table 3.4 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: EU Commodity Code : HS 030614							
Year	India	Canada	China	Denmark	Norway	Spain	Thailand	USA
Aerage	0.51	1.63	0.63	1.48	1.33	0.66	1.86	1.68
SD	0.12	0.65	0.33	0.25	0.41	0.11	0.77	0.37
CV	23.47	40.06	53.00	16.60	31.00	16.89	41.24	22.08

Source: Author's Calculation

Table 3.5 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: EU Commodity Code : HS 030749						
Year	India	Denmark	Norway	Spain	Thailand	USA	China
Average	0.83	1.38	2.68	0.93	1.09	0.50	0.78
SD	0.06	0.29	2.68	0.13	0.17	0.15	0.15
CV	7.82	20.74	100.10	13.73	15.21	29.07	19.62

Source: Author's Calculation

Table 3.1 the average price behavior of India and competitors in the EU market for the product group 030611. The table indicates that India has been successful to maintain prices competitiveness (47 percent) during the period 1995-2014. Moreover, it is understood that on an average, Vietnam and Denmark are not able to supply fishery products at competitive price. India faces competition from China, Canada, Spain, Norway and USA, except the case of China all other competitors does not have an advantage over India as they were not able to maintain price level below unity.

Similarly, the price competitiveness of India (69.34 percent) is also more consistent than that of China (70.41). Table A3.1 shows that except for the two years 1999 and 2010 India has price competitiveness all the years. A comparison with other countries makes us understand that China places stiff competition as it maintains its competitiveness below unity in all the years (see Table A3.1).

Table3.2 shows the average price behavior and consistency in the case with the product group 030612. It is understood from the table that though competitive price prevails with India, Canada and China the consistency is more with Canada and China having 26.60 and 21.35 percent respectively, the Indian case is a bit high at 50.46 percent. The other competitors like Denmark, Norway, Spain and US experienced an increase in the relative price index above unity and therefore are not competitive. Moreover, Table A3.2 shows that years 1997 and 2010 marked the prices to rise above unity in the case of India whereas China was able to maintain it below unity for those data available years.

In the case of the product group 030613, it is inferred from table 3.3 that on an average India, China, Canada, Denmark and Norway has competitive price as there are below unity. The consistency of price competitiveness is more with china (11.36 percent) and Denmark (13.14 percent). The consistency of India remains at 14.84 percent and is better than other competitors like Canada and Norway. Moreover, it is understood from table A3.3 that India's competitive price keeps on increasing from 0.66 (66 percent) in 1995 to disadvantageous position in 2013 (1.19) and 2014 (1.03).

For the product group 030614 India faces competition with China and Spain as they maintain relative price index below unity on an average during the study period. India's price remains stable as compared to China (53 percent) and less stable as compared to Spain which maintains at 16.89 percent (see Table3.4). Table A3.4 also shows the same picture that India will have competition from China and Spain as they are able to keep competitive price during the entire study period 1995-2014. The case with the commodity group 030749 is that India was able to maintain its competitiveness by keeping it below unity along with USA, China and Spain. India was competent enough with more consistent price at 7.82 percent abysmally low variation when compared to Spain (13.73 percent), China(19.62 percent) and USA (29.07) percent. India was able to keep price competitive along with USA and China during all the years from 1995-2014. A comparison with rest of the countries is not required as they are well above unity (see tableA3.5).

The selection of the items is based on high frequency of trade and the availability of data for most of the years. It is true that there are slight fluctuations; India's price competitiveness has got accredited in the EU market. On an average, India's price is competitive for all the commodity groups and is comparatively stable. It is understood from the above calculations that for all the commodities considered China turned out to be the main competitor followed by Spain and USA.

In the above calculation, we have considered 7 competitors of India to have an understanding and to make a comparison with respect to its competitors. The above result shows that the average price of India and China over the period is more competitive though they are less consistent. Though USA and Spain has more consistency, their price is not competitive for all the years over the study for the commodity groups. The probability of China becoming a tough competitor for India has not been ruled out.

3.2 Price Competitiveness with the trade Partner USA: A Comparison with Competitors

India's trade relation with USA springs from its comparative advantage of natural endowment. It draws our attention to analyze the price comparison of a country which is our trading partner and at the same time a potential supplier fishery sector product in the world market. Systematically linked with the earlier analysis, the preeminence in competitiveness has been seen. Table A3.6 to table A3.10 indicates the price competitiveness of

India's fishery sector exports to the USA's market. The commodity group wise analysis has brought the description of India's price behavior along with its trade rivals in the USA market. The products considered for the analysis are more relevant to India and its competitors in trade.

Table 3.6 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: USA Commodity Code : HS 030613								
Period 1995-2014	India	Canada	Chile	China	Denmark	Spain	Thailand	Vietnam
Average	0.71	0.93	1.33	0.66	0.53	2.04	0.99	0.80
SD	0.19	0.20	0.56	0.19	0.19	1.40	0.17	0.09
CV	26.50	21.42	41.90	28.20	34.85	68.56	17.17	11.84

Source: Author's Calculation

Table 3.7 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: USA Commodity Code : HS 030614								
	India	Canada	Chile	China	Denmark	Spain	Thailand	Vietnam
Average	0.73	0.74	1.07	0.50	0.83	2.10	1.33	0.75
SD	0.30	0.13	0.35	0.10	0.14	0.46	0.25	0.11
CV	41.75	17.70	32.72	20.81	16.72	22.00	18.57	14.11

Source: Author's Calculation

Table 3.8 SD and CV for Commodity wise Price competitiveness of India with its competitors

TradePartner: USA Commodity Code : HS 030749						
Year	India	Canada	China	Spain	Thailand	Vietnam
Average	0.73	0.99	1.06	1.30	1.42	0.86
SD	0.21	0.35	0.27	0.26	0.17	0.14
CV	28.68	35.54	25.83	20.06	11.67	15.74

Source: Author's Calculation

Table 3.9 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: USA Commodity Code : HS 030759						
Year	India	Canada	China	Spain	Thailand	Vietnam
Average	0.37	1.67	0.99	1.7	0.59	1.26
SD	0.15	0.55	0.35	0.35	0.06	0.31
CV	41.71	33.21	35.24	20.57	10.57	24.64

Source: Author's Calculation

Table 3.10 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: USA Commodity Code: HS 030799						
Year	India	Canada	Chile	China	Spain	Thailand	Vietnam
Average	0.26	1.04	1.50	0.50	0.64	0.46	0.46
SD	0.12	0.25	0.98	0.25	0.43	0.12	0.14
CV	46.37	24.36	65.59	49.66	66.31	26.82	29.60

Source: Author's Calculation

It is understood from table 3.6 that on an average India was able to maintain competitive price in the USA market along with Canada, China, Denmark, Vietnam and Thailand for the product group 030613. Focusing on consistency in price competitiveness, Vietnam has the least variation 11.84 percent; India's case is not dismal, 26.50percent slightly lower than the other competitor China. Table A3.6 shows that India maintains competitive prices till 2012 and thereafter it raises above unity whereas China, Denmark, and Vietnam was able to maintain its competitiveness although the years. The other competitors like Canada, Chile, Spain, Thailand lack competitiveness especially in the later half of the study period (see Table A3.6).

Table 3.7 shows that on an average India, Canada, China Vietnam and Denmark retained competitive price in the world market. with respect to the commodity group 030614. Regarding consistency Vietnam's continued more consistency (14.11percent) whereas India's competitiveness is less stable and remained high at 41.75 percent. An analysis of table A3.7 exhibits that India's price competitiveness was above unity for the two years 1997 and 2013 and maintains the competitiveness for the rest of the years. A comparison with its trade rivals show that Canada, China, Denmark and Vietnam maintains competitive price throughout the years during the study period.

In the case of product group 030749, it can be inferred from table 3.8 that Canada, Vietnam and India are only able to retain price competitiveness and the consistency is more with Vietnam. Similarly, for the product group 030759 India keeps its price competitive along with China and Thailand, Thailand price remained consistent during the study period 1995-2014 (see Table 3.9).

However, the price competitiveness of the product group 030759 has been confined by comparing with other trade rivals and found that only Thailand was able to keep the index below unity (Table A3.9). China's index is above unity since 2008 and therefore is not a potential competitor. We further examined the case of the commodity group 030799 with respect to the trade rivals Canada, Chile, Spain Thailand and Vietnam (see Table A3.10). Of all these countries analyzed India, Thailand, Vietnam were able to keep the competitiveness below unity during the study period and also China only for the year 1998 it was above unity. But India and China happened to witness less price stability 46.36 percent and 49.66 percent respectively when compared to Thailand 26.82 percent and 29.60 percent (see Table 3.10).

In the case of trade with USA, it may be inferred from the above analysis that of all the 7 competitors considered India experiences competition from China, Thailand and Canada. Having seen the price behavior with respect to the trade partner U S A, we have further moved to see the trend in price competitiveness with respect to the other trade partner, Japan.

3.3 Price Competitiveness with the trade Partner Japan: A Comparison with Competitors

The tables A3.11 to A3.15   provide the trends in India's price competitiveness with Japan along with its competitors for the individual years 1994-2014. The average over the period and the coefficient of variations is furnished in tables 3.11 to 3.15.

Table 3.11 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: Japan Commodity Code : HS 030613					
Period 1995-2014	India	China	Canada	Denmark	Thailand	USA
Average	0.78	0.61	0.76	0.76	1.06	1.29
SD	0.09	0.08	0.15	0.15	0.18	0.27
CV	11.84	12.76	20.10	19.53	17.15	20.98

Source: Author's Calculation

Table 3.12 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: Japan Commodity Code : HS 030614					
Period 1995-2014	India	China	Canada	Norway	Thailand	USA
Average	0.44	0.58	0.82	1.80	0.99	1.09
SD	0.13	0.14	0.10	0.46	0.48	0.29
CV	30.14	24.85	11.76	25.69	48.16	26.41

Source: Author's Calculation

Table 3.13 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: Japan Commodity Code : HS 030749					
Period 1995-2014	India	China	Spain	Thailand	USA	Vietnam
Average	0.76	0.84	0.70	1.74	0.26	0.47
SD	0.18	0.11	0.26	0.17	0.08	0.15
CV	24.11	13.03	37.41	10.03	29.77	31.85

Source: Author's Calculation

Table 3.14 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: Japan Commodity Code : HS 030759						
Period 1995-2014	India	China	Spain	Thailand	USA	Vietnam
Average	0.36	1.08	0.90	0.54	0.88	0.70
SD	0.20	0.25	0.08	0.13	0.43	0.13
CV	54.90	23.11	9.36	24.64	48.22	18.69

Source: Author's Calculation

Table 3.15 SD and CV for Commodity wise Price competitiveness of India with its competitors

Trade Partner: Japan Commodity Code : HS 030799					
Period 1995-2014	India	China	Canada	USA	Vietnam
Average	0.35	0.89	1.38	1.05	0.56
SD	0.11	0.35	0.27	0.33	0.10
CV	29.99	39.64	19.27	31.76	18.14

Source: Author's Calculation

Table 3.11 provides the average price competitiveness of India and world potential competitors for the period 1995-2014 for the product group 030613 in the Japan market. It is understood from the table that China, Canada, Denmark and India are able to maintain price competitiveness in the world market. In addition to that the consistency in price competitiveness are more stable for India(11.84 percent) as compared to other competitors. From the table A3.11 the price competitiveness of India with the trade partner Japan viz a viz its competitors has provided us the fact that India is price competitive for all the years except for the year 2013. It is understood from the same table that China, Canada and Denmark are our competitors. We further examined the case with another product category 030614. Here, India faces stiff competition from China as the index is 58 percent. (see Table 3.12). An analysis of price consistency shows that India is least advantageously placed when compared to China (24.85 percent) and Canada (11.76 percent). (See Table 3.12). Canada and Thailand also have competitive price, but it shows high inter-temporal variations during the study period (See Table A3.12). In the case of the product group 030749 India experiences competition from China, Spain, USA and Vietnam (see Table 3.13 and Table A3.13). Similarly, India has price competitiveness for the product group 030759 and faces competition from Spain, Thailand and Vietnam. Moreover, for the product group 030799 India's price remains competitive and faces more threat from Vietnam and China, though China's price is not competitive for the terminal years since 2013 (See Table A3.15). An eye-view of the tables 3.13 to 3.15 draws our attention to the relative stability of the products groups 030749, 030759 and 030799 respectively. On comparison, from table 3.13, it is clear that for the commodity group except with China, for the other countries it is relatively stable. Regarding the case of the product group India's case happens to be highly unstable 54.90 percent whereas with regard to 030799, the main competitor being China and India has comparatively stable prices with 29.99percent.

Of all the 5 commodity groups considered with 7 competitors, it is understood from the above analysis that India and China are able to keep their price competitive in the Japan market for all the commodities. Canada, Thailand and Vietnam also retained their competitive prices in 3 out of the 5 groups considered. Therefore, it may be inferred that India is expected to face tougher competition especially from China as compared with other competitors like Canada, Thailand and Vietnam.

India's performance is in fact more creditable as the price remained competitive in all the three markets – EU, USA and Japan. Thus India did fairly well in these markets. The performance of India in these markets has been contributed by its factor endowment there by having comparative cost advantage, increase in the world demand of fishery products from India resulted in economies of scale with a fall in the average cost of production, Government's effective intervention with more export subsidies nurturing the sector etc. Productivity has a direct positive correlation with exports (Bernard, Jensen, & Schott, 2003; Edwards, 1998); hence the next section tries to examine the trends in productivity.

4.India's Fishery Sector Trade: Examining the trends in Productivity

To analyze the productivity trends[13] of Indian Fish Processing Industry the total factor productivity has been seen using the Kendrick Index and Solow Index. While calculating for Kendrick Index, for the pre WTO period, the base period has been 1980-81 where as for the post WTO period it is arbitrarily taken as 1994-95. Solow's index of TFPG has been estimated with equation 7. Indices of partial productivity – capital productivity & labor productivity and the capital intensity is furnished in the figures below.

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[13] It is assumed that most of the processed products have been marketed in the international market rather than in the domestic market. Moreover, there is deficiency of firm level data over the long period of analysis to make a comparative study at firm level.

Figure 4.1 Indices of Partial Factor Productivities and Capital Intensity.
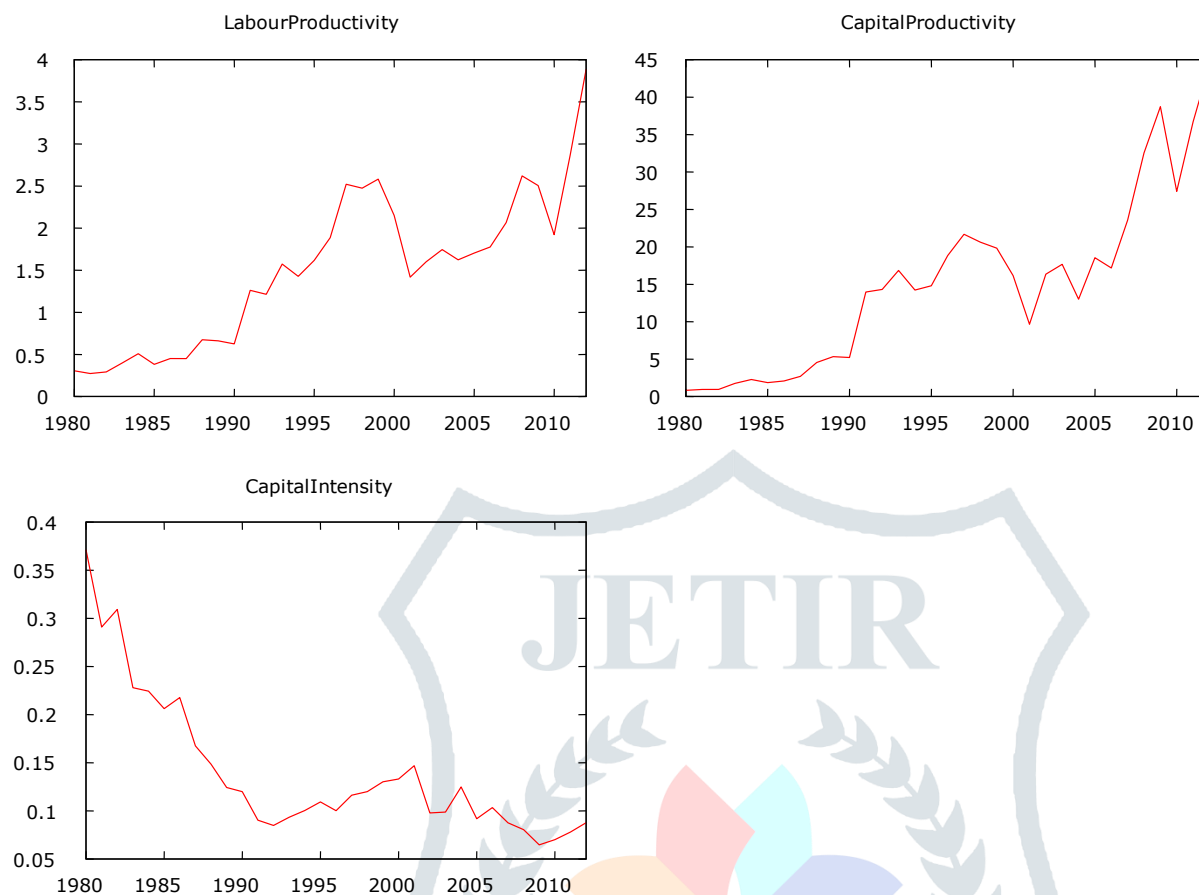
The figure 4.1 shows that both the labor and capital productivity keeps an increasing trend over the study period. Labor productivity show an increasing trend with regularly fluctuating pattern and after 1995 it shows a steep increase leading to an abrupt fall in labor productivity in the year 2000 and afterwards it gained momentum to pace up. Similar trend can also be noticed in the case of capital productivity. The capital productivity experienced a slow steady trend till 1995.The year 2000 witnessed a steep fall in capital productivity also and the intensity increased with up and downswings till 2005 and thereafter a precipitous increase.

Table 4.1: Indices of Partial and Total Factor Productivity Growth

Period	Labor Productivity	Capital Productivity	Kendrick Index	Solow Index
1980-81 to 1985-86	0.07	0.22	0.15	0.25
1986-87 to 1990-91	0.12	0.25	0.11	0.34
1991-92 to 1994-95	0.30	0.43	0.3	-0.26
1995-96 to 1999-00	0.13	0.08	0.08	0.18
2000-01 to 2004-05	-0.07	-0.02	-0.09	-1.25
2005-06 to 2012-13	0.14	0.19	0.16	0.41

Source Authors own calculation
Note: Annual Averages of these indices are taken.

As a prelude to the analysis of TFP we examined the labor productivity and capital productivity. The five yearly average of the partial factor productivity in table 4.1 shows a marked increase in labour and capital productivity. The labour productivity consistently increased from 7percent to 12percent and then to 30percent during the pre WTO period for the years 1980-81-1985-86, 1986-87 to 1990-91and 1991-92 to 1994-95 respectively. Estimates of capital productivity for the sub periods observed consistent inter temporal growth rates in pre WTO period from 22percent to 25percent and a marked rise to 43percent.

A comparison with Post WTO period brings a dismal picture. Moreover, the rate of growth during 1995-96 to 1999-00, the initial years of the change in trade scenario with the inception of WTO, the pace of growth was 13 percent and 8 percent respectively for labor and capital productivity. Both labour and capital productivity recorded negative growth rate during the period 2000-01 to 2004-05. From the negative partial productivities, the sector drastically improved to 14 percent and 19 percent respectively for labour and capital productivity. This negative growth rate can be ascribed to EU ban of India's fishery products in 1997, subsequent ban of in 2000 by USA, imposition of anti dumping duties by USA against India in 2004-05 (Kleih, Greenhalgh, & Marter, 2006). These bans generated a short term impact which led to fall in productivity during the period. Barring that period the other two sub periods recorded rapid growth and in the later phase it recovered remarkably. The intricacies for those negative growth rates need to be looked into. It could be attributed to the structural transformation taken place in this sector. It invokes our attention that with the onset of WTO the sector witnessed fall in partial productivities and obviously linked to the policy shifts. The growth in labor productivity does mean efficient utilization of labor as capital intensity keeps declining in the pre WTO period and started increasing marginally since 1990 keeping the trend for a decade, afterwards again a steep decline. During 2000-2010 also witnessed falling growth rate in capital intensity with a conscientious growth since 2009 and is evident from the figure 4.1.

To have a clear picture of the overall factor productivity growth, we restored to Kendrick Index and Solow Index. Viewed from the angle of Kendrick and Solow approach to measure productivity and the available evidence of TFPG in Indian Fishing industry is displayed in table 4.16. Turning to the TFP estimates, it is seen that there have been a consistent growth of TFP as per Kendrick Index and Solow Index, during the pre WTO period. But Solow index showed a negative growth rate for the period 1991-92 to 1994-95.

The Post WTO period witnessed an increase in average annual growth rate of 8percent and 18percent during 1995-96 to 1999-00 in the Kendrick and Solow index respectively. Both the indices recorded negative growth rate which can also be associated to negative growth recorded in partial productivities. However, over the period 2005-06 to 2012-2013 witnessed a substantial improvement in TFPG with a significant gain of 16percent and 41percent shown by average annual growth rates in the Kendrick index and Solow index.

During the pre WTO period both the partial productivities grew and the growth of capital productivity was much more intense than the growth of labor productivity. Estimates for the post WTO period witnessed sluggish growth rates with marked inter-temporal differences. The fall in the growth rate of both partial and total factor productivity growth rates during 2000-01 to 2004-05 can well be attributed to policy changes taken place either at the global level or at the national level. Finding a growth rate keeping an increasing trend for the partial productivities associated with a declining trend of capital intensity makes us to conclude that the growth in labor productivity has not been achieved through capital deepening. It is understood that the ratio of unskilled to skilled labor favors the former. This characteristic is exclusively sector specific. The increased intervention of the government addressing the issue at grass root level by giving more training to farmers, fishermen[14] and other associated workers[15] in the processing sector could have been the reason for increased labor productivity. Along with the increased productivity of labor, the exporting units works more with imported technology supported for improvement in capital productivity.

The magnitude of TFP growth is marginally different for the two indices, but converges to same results. The above discussion leads to the immediate conclusion that there is evidence of acceleration in productivity growth since the inception of WTO with its new policies on standards. Here comes the importance of first tier suppliers. It may be presumed that the difference in the residuals between these sub periods though marginal is not because of less intensity in the resource use at the processing stage but what is more important is the efficiency at supply chain right from catching and the technology by which it is worked upon. The fishery sector there is a large incidence of unorganized or informal sector existing in parallel which is not covered by ASI data. The improved technology where which they work upon caters more for catching and allied activities which is left unrecorded. This drawback fails to bring the reasoning behind distinct improvement in TFPG.

5 Conclusion

The paper is an attempt to understand India's competency in exporting fish and fishery products in terms of productivity and price competitiveness to sustain in the international market in the presence of more percolation of NTMs. Thus we are particularly interested in analyzing the question whether the key variables pertaining to the sector has contributed to increase in productivity and thus the aggregate productivity has been a contributory factor for the overall export performance. Productivity, technological adaptability, structural stability and the policy of the environment are the crucial factors that altogether contribute to competitiveness. There is a healthy change pertaining to the fish processing industries in terms of its productivity improvement in the post WTO period. But, it is revealed that India has remained competitive with its trade partners – EU, USA and Japan as

[14] Focus group discussion with exporters revealed that since the entire supply chain has to fall in line with WTO requirements of food and safety standards, all the stakeholders are given required training through export promotion institutions.

[15] The workers in the processing units are more than employees and they were given frequent training regarding the precautions to be taken, health safety rules to be followed while cleaning the raw fish etc

against its trade rivals during the study period. The decline in price competitiveness is only marginal with its competitors. It is observed that for our trade partners the most potential threat is from China and Canada. The products enter these markets as per their standardized form and therefore it is relatively straight forward to make a price comparison for analyzing the price competitiveness. In this point, the underlying belief that the quality of the product traded by a developing country falls behind a developed one cannot withstand and the whole question of quality difference is challenged. Thus the ability of India with its availability of its natural resource aided and abetted by the different policy induced measures might have helped a lot to retain the market with its competitive price. The level of price prevailing in the international market is an important parameter which can determine the level of demand for a commodity. If the commodity that is being exported is not price competitive, it can adversely affect the demand and thus the pattern of trade. Thus the issue of price competitiveness deserves special concern in trade literature and is a matter of concern for the export sector as a whole. With all these trade standards persisting, our empirical finding supported the argument for further extending and intensifying trade avenues with these countries.

This has revealed and provided the strong evidence that non price factors are most operative constraints for India's trade in fishery sector products. Therefore the next chapter tries to quantify the effect of NTMs on India's fishery trade.

Appendix 3A

Table A3.1Commodity wise Price competitiveness of India with its competitors

| Trade Partner: European Union Commodity Code : HS 030611 | | | | | | | |
Year	India	Canada	China	Denmark	Spain	Norway	USA	Vietnam
1995	0.31	NA	Na	1.87	1.00	Na	0.86	Na
1996	0.35	NA	0.19	1.71	0.97	0.20	0.75	Na
1997	Na	NA	0.19	1.43	0.80	0.39	0.75	Na
1998	0.39	NA	0.20	0.96	0.86	1.00	0.78	Na
1999	1.47	2.38	0.19	0.67	1.06	Na	0.70	Na
2000	0.70	0.56	0.32	1.42	0.93	0.56	0.94	Na
2001	0.37	0.05	0.31	1.40	1.05	Na	1.07	1.03
2002	0.32	NA	0.00	0.41	0.92	Na	1.08	0.94
2003	0.31	NA	0.00	0.56	0.88	0.15	0.57	0.88
2004	0.26	NA	0.26	1.92	0.92	Na	0.80	0.92
2005	0.20	0.86	0.31	0.21	0.72	Na	1.06	0.95
2006	0.27	NA	0.20	0.76	0.92	Na	0.79	0.83
2007	0.35	0.36	0.00	1.85	0.97	Na	0.86	0.89
2008	0.29	1.07	0.22	2.52	0.88	1.24	1.06	1.07

2009	0.52	1.03	0.00	0.92	0.80	0.61	1.41	1.69
2010	1.11	0.74	0.56	1.60	0.72	1.74	1.19	1.11
2011	0.52	0.69	0.52	1.91	0.89	1.52	1.05	1.12
2012	0.45	0.48	0.38	1.85	0.93	Na	0.94	Na
2013	0.35	1.03	0.27	2.31	1.00	1.21	1.23	1.04
2014	0.35	0.74	0.36	1.71	1.25	Na	1.30	0.87

Source: Author's Calculation

Table A3.2 Commodity wise Price competitiveness fo India with its competitors

Trade Partner: European Union Commodity Code : HS 030612						
Year	India	Canada	Denmark	Norway	Spain	USA	China
1995	0.4	0.86	1.2	0.57	1.11	1.4	0.43
1996	0.85	0.77	1.52	0.77	3.33	1.54	0.43
1997	1.33	0.55	1.39	1.02	0.67	1.37	Na
1998	Na	0.53	1.6	0.62	1.82	1.28	0.52
1999	Na	0.58	1.59	0.66	1.27	1.34	0.47
2000	0.57	0.56	1.18	1.13	1.78	1.46	0.56
2001	0.61	0.55	1.27	0.55	0.87	1.3	0.49
2002	0.57	0.49	1.46	0.68	2	1.47	Na
2003	0.41	0.58	1.36	1.4	1.05	1	Na
2004	0.27	0.9	1.56	1.19	0.88	1.16	Na
2005	0.52	1.07	1.21	0.75	0.67	0.85	0.4
2006	0.35	1.14	0.99	1.07	0.54	1.23	0.3
2007	0.45	0.99	1.44	1.76	0.5	1.05	0.33
2008	0.2	1.05	1.03	1.43	0.9	1.07	0.31
2009	0.29	0.95	1.14	1.48	0.79	1.29	0.3
2010	1.09	0.96	1.08	0.64	0.85	1.09	0.41
2011	0.57	0.76	1.4	1.22	0.92	1.09	0.4
2012	0.47	0.92	1.44	0.71	0.69	1.16	0.29
2013	0.51	0.87	0.94	1.98	0.89	1.38	0.48
2014	0.66	0.67	0.7	1.15	0.76	1.43	0.33

Source: Author's Calculation

Table A3.3Commodiy Wise Price competitiveness of India with its competitors

Trade Partner: European Union Commodity Code : HS 030613							
Year	India	Canada	China	Denmark	Norway	Spain	Tailand	USA
1995	0.66	0.47	0.82	0.66	0.57	1.27	1.40	1.30

1996	0.66	0.60	0.73	0.74	0.59	1.31	1.46	1.13
1997	0.81	0.41	0.76	0.67	0.68	1.31	1.54	1.12
1998	0.69	0.43	0.68	0.67	0.43	1.18	1.45	1.53
1999	0.78	0.40	0.65	0.69	0.41	0.43	1.43	1.50
2000	0.79	0.42	0.64	0.54	0.45	1.37	1.38	1.46
2001	0.87	0.41	0.67	0.50	0.49	1.42	1.36	1.54
2002	0.83	0.65	0.74	0.53	0.58	1.39	1.34	2.62
2003	0.86	0.52	0.46	0.56	0.64	1.68	1.43	0.64
2004	0.91	0.51	0.64	0.54	0.70	1.53	1.26	1.86
2005	0.92	0.47	0.65	0.60	0.83	1.47	0.89	1.10
2006	0.97	0.43	0.66	0.62	0.79	1.40	1.00	1.38
2007	1.03	0.45	0.62	0.70	1.00	1.17	1.07	1.47
2008	0.82	0.95	0.60	0.74	0.73	1.35	0.98	0.96
2009	0.92	0.65	0.69	0.73	0.84	1.26	1.03	1.70
2010	0.93	0.62	0.71	0.66	1.09	1.23	0.96	1.45
2011	0.92	0.54	0.74	0.67	0.90	1.01	1.09	1.11
2012	0.91	0.63	0.78	0.78	0.85	1.10	1.13	1.09
2013	1.19	0.56	0.66	0.77	0.91	1.15	1.37	0.97
2014	1.03	0.54	0.64	0.75	0.82	1.16	1.56	0.97

Source: Author's Calculation

TableA3.4 Commodity Wise Price Competitiveness of India with its Competitors

Trade Partner: European Union Commodity Code : HS 030614								
Year	India	Canada	China	Denmark	Norway	Spain	Thailand	USA
1995	0.51	2.15	1.94	1.49	0.99	0.79	2.76	1.78
1996	0.60	2.17	0.79	1.46	1.40	0.90	0.58	1.49
1997	0.48	2.31	0.74	1.25	1.39	0.74	0.48	2.47
1998	0.63	1.88	0.32	1.11	0.91	0.80	0.63	1.10
1999	0.54	1.52	0.69	1.29	0.60	0.71	1.13	1.68
2000	0.43	2.39	0.44	1.16	0.73	0.63	1.82	1.47
2001	0.46	2.37	0.48	1.46	0.97	0.67	2.86	2.17
2002	0.47	1.40	0.48	1.10	0.92	0.51	2.73	2.10
2003	0.47	3.38	0.58	1.45	1.29	0.63	2.99	1.81
2004	0.53	1.81	0.48	1.37	1.23	0.69	2.55	1.79
2005	0.42	1.26	0.54	1.50	1.44	0.59	2.73	1.49
2006	0.43	1.21	0.55	1.36	1.45	0.75	1.82	1.81

2007	0.56	1.00	0.43	1.39	1.43	0.63	1.51	1.74
2008	0.46	0.99	0.55	1.55	1.80	0.53	1.58	1.00
2009	0.49	1.10	0.64	1.53	1.65	0.40	1.87	1.45
2010	0.96	1.00	0.86	1.61	1.30	0.64	1.65	1.48
2011	0.40	1.12	0.55	1.81	1.33	0.68	1.53	1.23
2012	0.46	1.19	0.53	1.84	2.02	0.65	1.76	1.66
2013	0.51	1.22	0.58	1.93	2.26	0.58	2.00	1.71
2014	0.46	1.09	0.45	1.89	1.49	0.72	2.16	2.24

Source: Author's Calculation

TableA3.5 Commodity Wise Price Competitiveness of India with its Competitors

Trade Partner: European Union Commodity Code : HS 030749							
Year	India	Denmark	Norway	Spain	Thailand	USA	China
1995	0.82	1.77	1.27	0.72	1.09	0.58	0.82
1996	0.81	1.77	0.47	0.80	1.18	0.55	0.78
1997	0.80	1.55	0.93	0.97	1.13	0.48	0.66
1998	0.78	1.52	0.60	0.91	0.90	0.91	0.62
1999	0.93	1.66	0.45	0.98	0.90	0.61	0.58
2000	0.93	1.65	3.38	0.94	1.00	0.53	0.72
2001	0.95	1.76	1.40	0.93	1.02	0.50	0.72
2002	0.89	1.59	0.59	0.86	0.96	0.44	0.69
2003	0.89	1.58	1.37	1.02	0.88	0.54	0.63
2004	0.78	1.51	1.19	1.16	0.88	0.50	0.84
2005	0.80	1.45	0.61	1.16	1.01	0.51	0.83
2006	0.77	1.09	1.77	0.97	1.08	0.43	0.68
2007	0.84	1.11	1.28	0.89	1.04	0.51	0.61
2008	0.79	1.04	6.06	0.87	1.04	0.76	0.60
2009	0.81	1.12	2.10	0.60	1.10	0.47	0.94
2010	0.77	1.03	1.51	0.99	1.21	0.39	1.07
2011	0.71	1.04	6.80	0.93	1.18	0.29	0.97
2012	0.84	1.08	7.28	0.98	1.29	0.32	1.00
2013	0.85	1.14	5.41	0.93	1.50	0.36	0.99
2014	0.75	1.11	9.09	0.90	1.37	0.34	0.89

Source: Author's Calculation

Table A3.6 Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: USA Commodity Code : HS 030613							
Year	India	Canada	Chile	China	Denmark	Spain	Thailand	Vietnam
1995	0.52	0.88	0.75	0.60	0.73	1.32	1.39	Na
1996	0.55	0.80	0.74	0.43	0.41	1.99	1.30	Na
1997	0.59	0.73	0.54	0.43	0.67	0.86	1.29	Na
1998	0.60	0.75	0.70	0.40	Na	0.09	1.01	Na
1999	0.63	0.77	0.81	0.40	Na	1.33	1.06	Na
2000	0.60	0.64	0.93	0.44	0.47	0.68	1.06	Na
2001	0.60	0.72	0.72	0.50	0.68	1.77	0.99	0.64
2002	0.59	0.79	0.73	0.55	0.66	1.45	1.08	0.73
2003	0.64	0.82	1.37	0.63	0.99	1.43	0.93	0.76
2004	0.65	0.82	1.28	0.67	0.63	0.75	0.82	0.83
2005	0.61	1.01	1.36	0.66	0.63	3.86	0.73	0.85
2006	0.65	1.05	1.44	0.65	0.33	1.03	0.80	0.87
2007	0.85	0.95	1.66	0.79	0.34	1.58	0.82	0.86
2008	0.88	0.86	2.22	0.94	0.45	3.71	0.86	0.91
2009	0.80	1.10	2.24	0.91	0.51	5.61	0.93	0.89
2010	0.77	1.02	1.75	0.90	0.68	1.39	0.89	0.96
2011	0.62	1.12	1.65	0.87	0.33	4.15	0.96	0.79
2012	0.68	1.48	2.03	0.90	0.38	3.18	1.01	0.69
2013	1.25	1.12	1.87	0.76	0.29	2.59	1.02	0.68
2014	1.10	1.10	1.75	0.72	0.43	2.03	0.97	0.77

Source: Author's Calculation

Table A3.7 Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: USA Commodity Code : HS 030614							
Year	India	Canada	Chile	China	Denmark	Norway	Thailand	Vietnam
1995	0.90	0.93	0.83	0.59	0.58	2.37	0.56	Na
1996	0.98	0.73	0.53	0.57	0.57	Na	1.19	Na
1997	1.30	0.51	0.82	0.68	0.63	Na	1.12	Na
1998	0.54	0.52	1.73	0.60	0.66	Na	1.54	Na
1999	0.70	0.67	0.77	0.48	0.86	Na	1.45	Na
2000	0.78	0.80	0.71	0.35	0.83	2.69	1.34	0.59
2001	0.50	0.67	0.70	0.39	0.74	1.69	1.76	0.70
2002	0.39	0.62	0.60	0.44	1.08	2.68	1.53	0.60

2003	0.52	0.80	0.95	0.50	1.03	2.44	1.25	0.62
2004	0.53	0.89	1.42	0.52	0.90	2.12	1.49	0.75
2005	0.48	0.68	1.20	0.42	0.85	2.13	1.42	0.79
2006	0.55	0.64	1.28	0.40	0.70	1.84	1.33	0.82
2007	0.69	0.82	1.31	0.37	0.88	1.87	1.25	0.77
2008	0.50	0.62	0.80	0.31	0.96	1.72	1.19	0.75
2009	0.68	0.62	1.24	0.59	0.83	1.33	1.46	0.95
2010	0.78	0.71	1.21	0.58	0.89	2.09	1.32	0.78
2011	0.58	0.92	0.99	0.52	0.90	2.68	1.06	0.70
2012	0.85	0.90	1.59	0.66	0.86	2.57	1.35	0.66
2013	1.61	0.89	1.53	0.56	0.86	2.21	1.48	0.83
2014	Na	0.81	1.28	0.54	0.87	1.24	1.55	0.89

Source: Author's Calculation

Table A3.8: Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: USA				
Commodity Code : HS 030749				
Year	India	Canada	China	Spain	Thailand
1995	0.69	1.73	1.18	1.50	1.35
1996	0.77	0.37	0.94	0.82	1.46
1997	0.74	0.67	0.76	1.55	1.50
1998	0.97	0.78	0.91	1.28	1.51
1999	1.14	0.94	0.91	0.94	1.33
2000	0.98	1.07	0.87	0.86	1.37
2001	0.83	0.67	0.87	1.20	1.30
2002	0.61	1.37	0.91	1.28	1.28
2003	0.69	0.80	0.84	1.34	1.15
2004	0.51	0.70	0.93	1.20	1.11
2005	0.48	0.87	0.90	1.30	1.18
2006	0.54	0.65	0.88	1.49	1.42
2007	0.69	0.76	0.90	1.39	1.45
2008	0.59	0.89	0.89	1.00	1.52
2009	0.48	1.24	1.29	1.29	1.51
2010	0.75	1.15	1.29	1.35	1.44
2011	0.46	0.98	1.27	1.40	1.47
2012	0.67	1.09	1.44	1.52	1.59

2013	1.02	1.66	1.61	1.39	1.76
2014	1.10	1.39	1.69	1.94	1.68

Source: Author's Calculation

Table A3.9 Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: USA Commodity Code : HS 030759					
Year	India	Canada	China	Spain	Thailand	Vietnam
1995	0.41	0.98	0.77	1.26	0.62	Na
1996	0.86	1.20	0.78	1.17	0.56	Na
1997	0.41	1.02	0.62	1.93	0.52	Na
1998	0.25	1.87	0.66	1.31	0.53	Na
1999	0.38	1.51	0.72	1.12	0.47	Na
2000	0.51	1.27	0.97	1.26	0.59	Na
2001	0.51	1.26	0.99	1.81	0.67	1.12
2002	0.35	1.97	0.86	1.63	0.57	1.27
2003	0.26	1.40	0.73	2.09	0.47	1.05
2004	0.20	0.71	0.74	1.64	0.57	1.24
2005	0.23	1.35	0.76	2.25	0.61	1.31
2006	0.27	1.73	0.71	1.88	0.67	1.23
2007	0.41	2.55	0.92	2.05	0.57	1.09
2008	0.31	1.28	0.97	2.32	0.56	1.25
2009	0.21	2.25	1.17	1.65	0.60	1.30
2010	0.31	2.56	1.48	1.83	0.60	1.35
2011	0.27	2.26	1.13	1.93	0.66	0.97
2012	0.28	1.94	1.38	1.67	0.60	2.24
2013	0.46	2.47	1.95	1.53	0.65	1.32
2014	0.52	1.84	1.49	1.86	0.69	0.93

Source: Author's Calculation

Table A3.10: Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: USA Commodity Code : HS 030799						
Year	India	Canada	Chile	China	Spain	Thailand	Vietnam
1995	0.35	1.01	2.30	0.43	1.19	0.57	Na
1996	0.27	1.30	2.41	0.55	0.24	0.56	Na
1997	0.27	0.99	1.47	0.40	0.74	0.52	Na
1998	0.13	1.27	2.38	0.33	1.43	0.48	Na
1999	0.33	1.54	2.06	0.37	0.17	0.45	Na

2000	0.11	1.29	1.79	0.36	0.44	0.37	0.41
2001	0.09	1.01	0.44	0.18	0.45	0.42	0.43
2002	0.41	1.11	0.50	0.27	0.36	0.43	0.48
2003	0.38	1.53	2.45	0.24	0.54	0.50	0.48
2004	0.17	1.14	1.64	0.22	0.58	0.35	0.46
2005	0.12	0.91	0.69	0.38	0.13	0.30	0.37
2006	0.25	0.78	1.88	0.60	0.22	Na	0.52
2007	0.57	0.79	2.64	0.86	0.41	0.45	0.60
2008	0.28	Na	3.77	1.15	0.81	0.73	0.66
2009	0.22	0.94	1.19	0.59	0.95	0.47	0.53
2010	0.36	0.97	0.65	0.54	1.55	0.37	0.35
2011	0.22	0.85	0.50	0.79	0.86	0.68	0.41
2012	0.15	0.71	0.29	0.76	0.64	0.43	0.75
2013	0.24	0.72	0.55	0.66	1.08	0.28	0.30
2014	0.24	0.82	0.38	0.33	0.09	0.29	0.22

Source: Author's Calculation

Table A3.11 Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: Japan Commodity Code : HS 030613					
Year	India	China	Canada	Denmark	Thailand	USA
1995	0.73	0.56	0.47	0.47	1.29	0.98
1996	0.76	0.56	0.56	0.57	1.33	1.05
1997	0.73	0.57	0.64	0.64	1.33	1.28
1998	0.66	0.57	0.53	0.54	1.05	1.47
1999	0.69	0.57	0.58	0.58	1.36	1.37
2000	0.78	0.59	0.78	0.79	1.28	1.13
2001	0.77	0.64	0.73	0.73	1.16	1.38
2002	0.83	0.67	0.76	0.77	1.11	1.52
2003	0.78	0.61	0.84	0.84	1.11	1.44
2004	0.78	0.67	0.81	0.81	1.09	1.55
2005	0.80	0.72	0.89	0.89	0.97	1.69
2006	0.90	0.67	0.90	0.90	0.96	1.52
2007	0.86	0.45	0.82	0.82	0.86	1.84
2008	0.79	0.59	0.74	0.74	0.83	0.74
2009	0.74	0.74	0.90	0.89	0.83	1.22
2010	0.65	0.65	0.74	0.74	0.83	1.12

2011	0.80	0.44	0.97	0.96	0.92	1.17
2012	0.70	0.65	1.04	1.03	0.95	1.09
2013	1.05	0.69	0.88	0.87	0.96	1.35
2014	0.90	0.62	0.64	0.64	0.96	0.94

Source: Author's Calculation

Table A3.12: Commodity wise Price competitiveness of India with its competitiveness

| Trade Partner: Japan Commodity Code : HS 030614 | | | | | |
Year	India	China	Canada	Norway	Thailand	USA
1995	0.17	0.52	0.87	1.64	0.70	0.85
1996	0.40	0.69	0.74	2.35	0.68	0.85
1997	0.39	0.71	0.83	2.60	0.93	0.71
1998	0.61	0.72	0.90	2.56	0.93	0.68
1999	0.65	0.58	0.77	1.69	1.09	0.67
2000	0.46	0.47	0.80	1.76	1.30	1.10
2001	0.42	0.59	0.80	2.14	1.46	1.51
2002	0.52	0.53	0.75	2.25	1.32	1.24
2003	0.47	0.45	0.77	1.83	1.06	1.10
2004	0.49	0.45	1.04	1.72	1.34	1.13
2005	0.58	0.48	0.90	1.84	1.56	1.34
2006	0.33	0.49	0.82	1.95	1.41	1.34
2007	0.49	0.47	0.96	1.46	1.36	1.30
2008	0.29	0.38	0.62	1.39	1.35	0.66
2009	0.29	0.49	0.72	1.09	1.68	1.49
2010	Na	0.51	0.75	1.29	0.72	1.45
2011	Na	0.61	0.77	1.75	0.17	0.93
2012	Na	0.67	0.83	1.80	0.23	0.93
2013	Na	0.96	0.95	2.05	0.29	1.36
2014	Na	0.82	0.81	0.79	0.26	1.24

Source: Author's Calculation

Table A3.13 Commodity wise Price competitiveness of India with its competitiveness

| Trade Partner: Japan Commodity Code : HS 030749 | | | | | |
Year	India	China	Spain	Thailand	USA	Vietnam
1995	0.70	0.84	0.72	1.84	0.25	Na
1996	0.62	0.64	0.86	1.69	0.22	Na
1997	0.68	0.71	1.24	1.69	0.26	Na

1998	0.80	0.71	0.97	1.48	0.35	Na
1999	1.22	0.86	1.15	1.70	0.30	Na
2000	0.92	1.00	0.55	1.61	0.24	0.46
2001	0.84	1.03	0.27	1.56	0.20	0.46
2002	0.88	1.03	0.46	1.64	0.19	0.45
2003	0.65	0.86	0.55	1.48	0.31	0.51
2004	0.68	0.80	0.67	1.71	0.30	0.56
2005	0.61	0.87	0.54	1.59	0.29	0.55
2006	0.60	0.78	0.26	1.67	0.26	0.51
2007	0.53	0.78	0.52	2.10	0.29	0.53
2008	0.72	0.88	0.95	2.06	0.49	0.55
2009	0.76	1.00	0.65	1.85	0.25	0.70
2010	0.42	0.93	0.71	1.78	0.17	0.43
2011	0.73	0.82	0.78	1.94	0.16	0.40
2012	0.84	0.82	0.99	1.90	0.17	0.44
2013	1.05	0.76	0.65	1.89	0.21	0.58
2014	0.87	0.74	0.54	1.65	0.21	Na

Source: Author's Calculation

Table A3.14 Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: Japan Commodity Code : HS 030759					
Year	India	China	Spain	Thailand	USA	Vietnam
1995	Na	0.85	0.79	0.65	0.39	Na
1996	0.36	0.75	0.91	0.62	0.41	Na
1997	0.40	0.80	0.86	0.62	1.95	Na
1998	0.24	0.83	0.86	0.70	1.07	Na
1999	0.32	1.03	0.71	0.67	1.20	Na
2000	0.66	1.33	0.89	0.67	1.42	0.80
2001	0.26	1.17	0.82	0.54	0.79	0.74
2002	0.10	0.92	0.90	0.40	Na	0.78
2003	0.18	0.85	0.90	0.33	0.74	0.64
2004	0.19	0.93	0.97	0.33	Na	0.64
2005	0.29	1.00	0.89	0.40	Na	0.69
2006	0.31	1.01	0.98	0.49	0.62	0.72
2007	0.28	1.05	0.97	0.44	0.70	0.58
2008	0.26	1.04	0.92	0.41	0.64	0.60

2009	0.95	1.51	0.85	0.58	0.48	0.90
2010	0.49	1.19	0.92	0.58	Na	0.75
2011	0.37	1.01	1.08	0.49	Na	0.53
2012	0.33	1.27	0.98	0.46	1.16	0.54
2013	0.54	1.73	0.80	0.82	0.98	1.01
2014	Na	1.26	0.97	0.58	0.65	0.66

Source: Author's Calculation

Table A3.15: Commodity wise Price competitiveness of India with its competitiveness

Trade Partner: Japan				
Commodity Code : HS 030799				
Year	India	China	Canada	USA	Vietnam
1995	0.29	0.54	1.10	0.70	Na
1996	0.49	0.68	1.24	0.79	Na
1997	0.33	0.66	1.27	0.85	Na
1998	0.54	0.64	1.04	0.57	Na
1999	0.27	0.85	1.22	0.89	Na
2000	0.27	0.88	1.18	0.86	Na
2001	0.34	0.75	1.04	1.01	0.52
2002	0.13	0.95	1.39	1.27	0.56
2003	0.30	0.93	1.29	1.13	0.56
2004	0.41	0.97	1.35	1.30	0.66
2005	0.39	0.75	1.35	1.67	0.65
2006	0.58	0.73	1.34	0.97	0.73
2007	0.37	0.69	1.46	1.17	0.41
2008	0.28	0.65	2.13	1.75	0.49
2009	0.27	0.69	1.58	0.75	0.67
2010	0.47	0.69	1.20	0.96	0.48
2011	0.34	0.79	1.53	0.81	0.53
2012	0.31	1.46	1.46	0.95	0.71
2013	0.35	1.86	1.70	1.67	0.46
2014	0.30	1.61	1.79	0.88	0.47

Source: Author's Calculation

Appendix: 3B

Product Code	Product Description
030611	Frozen rock lobster and other sea c
030612	Frozen lobsters
030613	Frozen shrimps and prawns
030614	Frozen crabs
030623	Shrimps and prawns (excl. frozen)
030624	Crabs (excl.frozen)
030741	Cuttle fish and squid, live, fresh
030749	Cuttle fish and squid (excl. live,
030759	Octopus (excl. live, fresh or chill
030799	Aquatic invertebrates,nes,includ.fl

Source: Comtrade Data

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