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Market shares, instability and revealed comparative advantage of seafood exports from India

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ABSTRACT

The present study analysed the export competitiveness of Indian shrimp. The index of instability for the overall seafood exports from India was 0.17 for the period 1991-2010. Shrimp is the major seafood export item of India with a growth rate of 2.89% and 10.47% in terms of quantity and value of exports respectively, during 1991-2011. Share of Indian shrimp in the world market declined slightly from 7.01% in 1990-1992 to 6.25% in 2008-2010 while the shares of China, Vietnam, Thailand and Indonesia increased owning to value addition and re-export of processed shrimp from these countries. Unit value realisation for Indian shrimp was US $ 5.69 per kg in 2009. All the major exporting countries experienced a decline in the unit value realisation due to changing supply- demand pattern and global slowdown. Export competitiveness index for Indian shrimp remained at 1.00 following a decline in the past few years. Revealed competitiveness index for Indian shrimp was 1.65 in the year 2009 indicating a comparative advantage of the country in shrimp exports. Processing, value addition and compliance with the changing international quality standards are the crucial areas for enhancing and sustaining the competitive position of Indian shrimp in the world market.

Keywords: Export competitiveness, Export instability, Revealed competitive advantage, Shrimp exports, Unit value

Introduction

The international trade in seafood keeps rising with the increase in the volume of trade in fresh food, backed by rise in consumer demand for processed food. Marine products form an important item in the export basket of India. The share of seafood in total agricultural exports of India was 17.13% during 2010-2011 (DGCI &S, 2012). Indian seafood exports have seen a consistent increase over the years. Seafood exports aggregated to 8, 13,091 t valued at ₹12,901.47 crore and US $ 2,856.92 million in 2010-11(MPEDA, 2012). With this increase, seafood exports recorded a growth of 19.85% in quantity, 28.39% and 33.95% in terms of export earnings in rupees and US$ respectively as compared to the year 2009-10 (MPEDA, 2012). Frozen shrimp is the flagship product in the seafood exports of India. It accounts for 19% of the quantity and 44% of the value of total exports. HACCP standards and EU norms have become mandatory, for the exporters after the WTO agreement. Indian exporters are now required to meet the international quality standards in order to sustain the exports. Accordingly, the Indian seafood exporters have upgraded their export firms' facilities to comply with the existing standards in these countries and in the process, have incurred higher incremental capital costs. In the light of these developments, this study analyses the performance of the Indian seafood exports with special reference to export of shrimp and explores the comparative competitive advantage that the Indian shrimp industry enjoys over other major seafood exporting countries.

Materials and methods

The study is based on the secondary data collected from various official publications. The data on total marine exports of India, export data of major seafood items and major markets were compiled from the various reports of Marine Products Export Development Authority of India (MPEDA). Performance of the total seafood exports of India, its composition and geographical penetration were examined using trend analysis. Compound growth rates (CGR) were calculated to analyse the trends in shrimp production as well as exports and imports of shrimp. The

data on total exports and shrimp exports of major exporting countries and world exports were collected from the FAO database on fishery commodities, trade and production for the calculation of market shares, relative export advantage and revealed competitiveness. MPEDA (www.mpeda.com) data on the value of seafood exports were detrended on wholesale price indices at 2004-05 prices obtained from reports of the Office of the Economic Advisor (www.eaindustry.nic.in). Nine major shrimp exporting countries *viz.*, Argentina, China, Denmark, Ecuador, Greenland, Indonesia, Mexico, Thailand and Vietnam were analysed for their export performance along with that of India after necessary segregation according to species cultured. The market share of exporters in total markets was obtained using the relation (Wesna, 2004):

$$Market\ share = \frac{X_{ij}}{X_{wj}} * 100$$

where, X_{ij} is the share of i^{th} country's export in the world export of j^{th} commodity and X_{wj} is the world export of j^{th} commodity.

The instability in the total seafood exports and shrimp exports was analysed using Cuddy Della Valle index (CDI) (Cuddy and Della Valle, 1978). The CDI takes into account the trend that is commonly present in the time series data and gives the modified (Cofficient of variation) accordingly. The index is obtained as follows:

$$Ix = CV\sqrt{(\overline{1-R^2})}$$

where, Ix = Cuddy Della Valle index of instability, CV = coefficient of variation and $\overline{R^2}$ = adjusted coefficient of multiple determination. The export competitiveness of countries with respect to shrimp was analysed using Export Competitiveness index (XCI) given by:

$$XCI^i_j = (X^i_j / X^w_j) / (X^i_j / X^w_j)_{t-1} \quad \text{(Wesna, 2004)}$$

Here, XCI^i_j is the export competitiveness of i^{th} country for product j (here, shrimp), X^i_j is the export of j^{th} commodity by i^{th} country and X^w_j is the world export of product j; t and t-1 are the time periods referring current and previous year. In order to know the country's competitive position in the world market, Balassa index or the revealed comparative advantage (RCA) was used (Balassa, 1965). which is given by:

$$RCA = (X_{ij}/X_{it}) / X_{wj}/X_{wt})$$

where, X_{ij} and X_{wj} are the exports of j^{th} commodity from the i^{th} country and world; X_{it} and X_{wt} are the exports of total marine exports of i^{th} country and world. RCA is otherwise known as relative export advantage (RXA). Another concept similar to RXA is relative import advantage (RMA) given by Vollrath, and is calculated as:

$$RMA = (M_{ij} / M_{it}) / (M_{wj} / M_{wt})$$

Here, M_{ij} and M_{wj} are the imports of j^{th} commodity by the i^{th} country and world M_{it} and M_{wt} are total marine exports of i^{th} country and the world respectively.

The difference between RXA and RMA is the relative trade advantage alternatively, the logarithmic difference between the two is known as revealed competitiveness (RC) and is given by:

$$RC = In\ RXA - In\ RMA$$

This gives the relative competitive position of a country in the trade of a particular commodity (Gopal *et al.,* 2009).

Results and discussion

Trends in the export of seafood products

Seafood export is one of the major earners of foreign exchange in India. The seafood export of India has shown significant increase over the years. The total seafood export by India increased from 1,71,820 t in 1991-92 to 4,24,470 t in 2001-02, while during the same period the value of total exports increased from ₹1,375.89 crores to ₹5,957.05 crores. Indian seafood exports in quantity grew by 7.26% during the period 1991-2000 and by 8.41% during 2001-2010 (Table 1). The growth in the value of exports of seafood was non-significant during 1991-2000 and declined by 0.05% in the next decade. However, for the period 1991-2012, the overall growth in the total seafood exports in quantity as well as value was found to be significantly positive. Again, the Cuddy Della Valle Index (CDI) showed that the instability in the seafood exports was 0.17 for the period 1991-2010, though the index of instability was higher at 0.14 during 1991-2000 which later declined to 0.12 during the period 2001-2010. Sarada *et al.* (2006), also found that the Indian seafood exports were quite sensitive and concluded that the instability could be tackled both through price stability measures such as improvement in the product profile through value addition and measures to stabilise the export volume through export diversification and

Table 1. Growth and instability in the total seafood exports of India

Year	CGR (%)		CDI
	Quantity (t)	Value (₹ crores)	
1991-2000	7.26*	1.44NS	0.14
2001-2010	8.41*	-0.05^{NS}	0.12
1991-2010	6.65*	1.38*	0.17

Source: MPEDA

*Significant at p = 0.01, NS : not significant

improvement in research and technology. The major markets for Indian seafood exports are Japan, USA, EU, South-east Asia and Middle East. The quantity of exports to EU, Japan and USA were 21%, 9% and 6% respectively in 2012. South-east Asia accounted for 48.34% of the total quantity exported, of which the share of China was about 20%. On the other hand, a major portion of the export earnings was from EU, USA and Japan and the share of these markets in total export earnings was 26.81, 15.42 and 13.04% respectively.

Geographical penetration of Indian seafood

The overall growth in the quantity and value of seafood exports to the major markets remained significant and positive at 6.23 and 1.35 respectively between 1996 to 2010 (Table 2). The value of seafood exports to Japan declined by 8.95% during 1996-2010 and during the same period, the value of exports showed significant positive growth for EU, South-east Asia, Middle East and other countries. EU, the major import market has shown a positive growth in the value of shrimp imports with a compound growth rate of 6.53. The increase in the exports to USA was non-significant both in terms of value and quantity over the period 1996-2010. Noteworthy is the expansion in the Indian seafood export market to the Middle East and other countries with a compound growth rate of 9.64 and 18.39% in quantity and 7.83% and 11.16% in rupee value of exports respectively.

Composition of major seafood exports from India

The important seafood export items from India are frozen shrimp, frozen cuttle fish, frozen squid and frozen fish. Though fish is the principal item of exports in terms of total quantity; shrimp is the major export commodity in terms of total value of exports (Table 3).

Fish and shrimp accounted for 40 and 20% of the total quantity of seafood exported from India for the period 2006 to 2010, whereas their share in terms of value was 13.05 and 66.33% respectively (MPEDA). This highlights the significant contribution of shrimp exports in the total export earnings. The compound growth rate of seafood exports showed that the decadal growth in the value of shrimp exports was negative during 2001-2010. However it showed the highest and significant growth during the period 1991-2011 when compared to other

Table 2. Growth in seafood exports to major markets

Year		1996-2000	2001-2005	2006-2010	1996-2010
Japan	Q :	0.90^{NS}	-4.15 ^{NS}	1.37 ^{NS}	-0.37 ^{NS}
	V :	0.38^{NS}	-18.65*	-8.20*	-8.95*
USA	Q :	8.05**	3.27 ^{NS}	-4.49 ^{NS}	1.24 ^{NS}
	V :	22.76^{NS}	2.56^{NS}	-16.59**	0.59^{NS}
EU	Q :	1.62^{NS}	6.13^{NS}	4.18*	10.14*
	V :	3.10^{NS}	14.54*	-4.96**	6.53*
$^{\$}$South-east Asia	Q :	-2.82^{NS}	4.77 ^{NS}	-7.57 ^{NS}	1.04 ^{NS}
	V :	0.22^{NS}	12.82^{NS}	8.71^{NS}	5.93*
Middle East	Q :	8.68 ^{NS}	2.63 ^{NS}	16.12*	9.64*
	V :	14.17^{NS}	14.73 ^{NS}	-0.94^{NS}	7.83*
Others	Q :	6.09 ^{NS}	19.18*	14.05**	18.39*
	V :	17.80^{NS}	33.03^{NS}	-2.92^{NS}	11.16*
Total	Q :	0.44 ^{NS}	3.35 ^{NS}	8.78**	6.23*
	V :	4.13^{NS}	2.41^{NS}	-3.48^{NS}	1.35*

Source: MPEDA, Q : Quantity; V : Value
$^{\$}$ Including China; *and ** : Significant at p = 0.01and p = 0.05 respectively; NS : not significant.

Table 3. Growth in export of major seafood products

Period		Frozen shrimp	Frozen cuttle fish	Frozen squid	Frozen fish	Others
1991-2000	Q :	4.75*	8.32*	2.43^{N}	11.15*	10.80*
	V :	1.83^{NS}	0.66^{NS}	-3.57**	-2.21^{NS}	29.38**
2001-2010	Q :	0.90^{NS}	5.44*	9.36**	6.75*	16.82*
	V :	-5.94*	5.40**	1.80^{NS}	8.08*	8.59**
1991-2011	Q :	2.89*	5.26*	4.39**	6.06*	17.52*
	V :	10.47*	4.33*	0.74^{NS}	4.92*	10.47*

Source: MPEDA, Q : Quantity; V : Value
*and ** i: Significant at p = 0.01 and p = 0.05 respectively; NS : not significant

major exportable seafood items. The decline in value realisation may be attributed to change in the composition of seafood from high value to low value items. Frozen fish and frozen cuttlefish are the other important items which showed significant positive growth in the export value.

It was observed that during 1991-2011, the growth in the quantity of exports was highest for frozen fish (6.06%) followed by frozen cuttlefish (5.26%) and frozen squid (4.39%) and the growth in the quantity of shrimp export was 2.89%. The category 'others' includes the exports of chilled, live and dried items which has shown impressive growth both in terms of quantity and value of exports.

Shrimp exports

Frozen shrimp dominates the Indian shrimp exports; but of late the proportion of non-frozen shrimp especially in preserved or prepared form has increased (Table 4). The proportion of frozen shrimp in the total exports was 85.14% in 2009 as against almost the entire exports being under frozen category in 1992, while the export of prepared/preserved shrimp has increased from a negligible share of 0.02 to 14.34% during the same period indicating a sharp increase in value addition and upward movement in the value chain.

Geographical spread of shrimp export markets across major producing countries

India's contribution in the world shrimp exports is hovering around 7 - 8%. The share of shrimp exports by India during 2008-2010 was 6.25% of the total world exports (Table 5). Based on overall shrimp exports and without segregation by species, China, Indonesia, Thailand and Vietnam are the other most important players in the world shrimp exports. After an initial slowdown in the exports during the triennium 1999- 2001, ten percent of the total world shrimp exports are accounted for by China.

The performance of Thailand, China and Vietnam have shown a significant improvement in shrimp exports with a share of 16.11, 10.46 and 10.09 % respectively in the world shrimp market. Ecuador, Denmark and Greenland have shown a slight decline in their exports during 2007-2010 as compared to 2005-2007. The compound growth rate of exports for Vietnam, China and Denmark were found to be 11.93, 10.52 and 5.69% respectively compared to the growth in the world export which stood at 5.22% (Table 6). China and Vietnam have retained high export thresholds as the imported shrimp is further re-exported to the world market after value addition. China's shrimp imports increased from 0.25% to 2.47% of world imports between 1990-92 and 1995-07 (Table 7). Vietnam's imports ranged from 0.12% (1999-2001) to 0.36% in 2009 in terms of quantity. Though the proportion of increase seems marginal, it is worth noting that the world shrimp import increased by about 96% between 1990 and 2009. Consequently it turns out that while China's imports increased from 2,122 to 4,0212 t, for Vietnam the increase was from 2,122 t to 8,021 t with respect to the reference period mentioned above. The increase in the volume of global shrimp trade points towards the scope for value addition by the processing firms. India has shown significant positive growth of 3.68% for the period 1991-2009 which emanates mainly from the increase in the exports during 1991-2000, whereas the growth in exports during 2001-2009 remained non-significant.

Unit value of shrimp exports

The unit value of shrimp exports has shown a continuous decline except for Vietnam, for which the

Table 4. Types of shrimp exports from India (1990-2009) (t)

Year	Frozen	Non-frozen	Prepared /Preserved	Total
1992	78409.00	176.00	14.00	78599.00
	(99.76)	(0.22)	(0.02)	(100.00)
1995	101681.70	188.33	161.00	102031.00
	(99.66)	(0.18)	(0.16)	(100.00)
1998	113119.70	695.66	350.33	114165.70
	(99.08)	(0.61)	(0.31)	(100.00)
2001	130516.30	1201.33	626.33	132344.00
	(98.62)	(0.91)	(0.47)	(100.00)
2004	157252.30	805.33	13331.67	171389.30
	(91.75)	(0.47)	(7.78)	(100.00)
2007	144060.00	1023.00	34925.00	180008.00
	(80.03)	(0.57)	(19.40)	(100.00)
2009	123817.50	755.50	20853.50	145426.50
	(85.14)	(0.52)	(14.34)	(100.00)

Source: FAO

Figures correspond to triennium average; Figures in parenthesis are percentage of total exports

Table 5. Market share of major producers in world shrimp exports (t)

Year	1990-92	1993-95	1996-98	1999-01	2002-04	2005-07	2008-10
Argentina	12868.67 (1.21)	15973 (1.31)	12250.33 (0.92)	36866 (2.45)	42325 (2.20)	30335.33 (1.28)	47391.5 (2.04)
China	101492.3 (9.52)	65395.33 (5.36)	56179 (4.21)	88792 (5.90)	180606.3 (9.38)	250746 (10.54)	243639 (10.46)
Denmark	63145 (5.92)	60997.67 (5.00)	72853.67 (5.46)	84884.33 (5.64)	124145 (6.45)	155872.3 (6.55)	122213.5 (5.25)
Ecuador	73944.33 (6.93)	76583.67 (6.28)	103690 (7.77)	58036.33 (3.86)	55808.67 (2.90)	112061.7 (4.71)	130014.5 (5.58)
Greenland	44129.33 (4.14)	46617.67 (3.82)	44520 (3.33)	49510.67 (3.29)	66484.67 (3.45)	68237.67 (2.87)	59472 (2.55)
India	74721.33 (7.01)	102031 (8.37)	114165.7 (8.55)	132344 (8.80)	171389.3 (8.90)	180008 (7.57)	145426.5 (6.25)
Indonesia	17489.33 (8.39)	30553.33 (7.20)	40672.67 (7.33)	41652.67 (6.89)	28217 (6.32)	35824.67 (6.26)	40653 (6.40)
Mexico	89439 (1.64)	87713.67 (2.51)	97895 (3.05)	103632.7 (2.77)	121728.7 (1.47)	149056 (1.51)	149094.5 (1.75)
Thailand	152591.3 (14.31)	223911.7 (18.37)	230532.7 (17.27)	248596.3 (16.53)	228851.7 (11.88)	328427 (13.80)	375009.5 (16.11)
Vietnam	40042.67 (3.76)	54777.67 (4.49)	58315.33 (4.37)	77237 (5.14)	151147 (7.85)	224320.7 (9.43)	235011.5 (10.09)
World	1066343 (100.00)	1218935 (100.00)	1335258 (100.00)	1503738 (100.00)	1925669 (100.00)	2379210 (100.00)	2328445 (100.00)

Source: FAO
Figures in parenthesis are % of total exports

Table 6. Growth in quantity of exports of shrimp by major producing countries (CGR %)

Year	1991-2000	2001-2009	1991-2009
Argentina	7.12^{NS}	-3.15^{NS}	7.11**
China	-2.51^{NS}	7.98**	10.52*
Denmark	3.81**	2.60^{NS}	5.69*
Ecuador	-0.008^{NS}	15.01*	2.62^{NS}
Greenland	0.57^{NS}	-0.03^{NS}	2.62^{NS}
India	5.04*	-0.73^{NS}	3.68*
Indonesia	2.04^{NS}	3.68**	3.86*
Mexico	9.07*	4.52^{NS}	2.00^{NS}
Thailand	3.78*	7.92*	4.08*
Vietnam	4.25^{NS}	9.28*	11.93*
World	3.42*	4.50*	5.22*

, *and ** : Significant at p = 0.01 and p = 05 respectively;
NS : not significant

unit value increased from 4.20 thousand US$ to 6.86 thousand US$ during 1991 to 2009 (Table 6). All the other countries also experienced a decline in the unit value realisation for shrimp exports. This might be due to the increase in the world production of cultured shrimp especially *Litopenaeus vannamei* species which has higher productivity but much cheaper as compared to the tiger shrimp (*Peneaus monodon*). This has resulted in enhanced supply of shrimp in the world market driving the unit value down, in the absence of corresponding increase in demand.

Unit value of shrimp export in case of India was found to be US$ 5.68 per kg in the year 2009 (Table 7) which is lesser than the unit value realised by Thailand, Vietnam, China, Argentina, Indonesia and Mexico whose unit value of shrimp exports were US$ 6.99, 6.86, 6.02, 6.21 and 8.09 per kg respectively. The major reason for this trend is the relatively low proportion of value added shrimp in total shrimp export basket of India as compared to major competitors especially Thailand, Vietnam and China. Though Mexico shows the same trend in unit value realisation, it had the highest unit value for shrimp exports. The growth in unit value has been either negative or not significant during 1991-2009 for all the exporters. Shyam *et al*. (2004) also observed decline in the unit value of Indian marine exports in the post-liberalisation era and highlighted the role of value addition.

Vietnam showed a positive growth of 9.23% in the unit value of shrimp for the period 1991-2000, whereas in the next decade the growth turned to be non-significant (Table 8). Shrimp is a high value item in the Mexican seafood industry and the wild caught blue shrimp and the white shrimp from Mexico commanded high market value. Globalisation of the world markets has made the economies more interdependent. Recession in Russia affected the expanding market of Denmark's shrimp in this country. Argentina, the major supplier to Spain realised lower unit values owing to the economic crisis, which also suffered a collapse in its fishery during 2004

Table 7. Unit value realisation by major shrimp exporters (Thousand US$ per t)

Year	Argentina	China	Denmark	Ecuador	Greenland	India	Indonesia	Mexico	Thailand	Vietnam
1991	7.53	6.05	6.40	6.19	6.11	*5.52*	8.12	12.73	8.26	4.20
1992	7.21	5.74	6.07	6.14	5.61	5.80	7.96	10.08	8.65	4.35
1993	5.89	5.50	5.38	6.25	5.32	6.20	8.96	12.41	9.73	4.79
1994	7.96	5.64	5.27	7.45	4.55	7.27	10.27	10.72	10.44	5.00
1995	9.98	6.26	6.41	7.78	5.73	6.94	11.01	12.63	11.40	6.85
1996	9.12	4.74	6.08	7.28	5.64	6.51	10.03	10.28	10.72	6.31
1997	8.70	4.41	4.97	7.97	4.44	7.20	10.85	13.35	11.81	5.89
1998	7.48	3.74	5.04	7.45	3.98	6.35	6.75	10.54	9.32	6.86
1999	7.41	3.62	5.17	6.45	3.89	6.17	8.42	9.03	9.63	7.82
2000	7.54	4.00	4.18	7.96	3.26	6.98	9.05	12.13	10.81	9.75
2001	6.09	4.29	3.77	6.34	2.86	5.74	7.69	11.06	8.69	6.73
2002	4.78	4.60	3.61	5.51	2.50	5.34	7.05	11.11	8.14	5.97
2003	8.09	4.68	3.91	5.22	2.77	5.13	6.43	11.39	7.40	6.13
2004	7.78	4.71	3.73	4.83	2.72	5.00	6.49	11.30	6.95	6.17
2005	12.13*	4.87	3.95	4.98	2.70	4.87	6.33	11.59	6.30	6.24
2006	9.48	4.96	4.00	5.01	2.73	5.44	6.72	9.59	6.60	6.19
2007	6.43	4.93	4.88	4.80	2.94	6.06	6.66	9.65	6.65	6.48
2008	8.86	5.73	5.84	5.46	3.50	5.97	7.01	9.86	7.05	6.71
2009	6.21	6.02	4.94	4.88	3.04	*5.68*	6.78	8.09	6.99	6.86

Source: FAO

* The value seems to be an outlier with the export quantity being 6,955 t valued at US$84338

Table 8. Growth in unit value of shrimp (1991-2009)

Year	1991-2000	2000-2009	1991-2009
Argentina	0.78^{NS}	2.08_{NS}	0.24^{NS}
China	-5.45*	3.86*	-0.48^{NS}
Denmark	-3.09**	5.60*	-2.12*
Ecuador	2.09^{NS}	-2.20^{NS}	-2.04*
Greenland	-5.25*	2.46^{NS}	-5.07*
India	1.43^{NS}	1.25^{NS}	-0.97**
Indonesia	0.08^{NS}	-0.78^{NS}	-2.25*
Mexico	-0.87^{NS}	-3.15*	-1.14**
Thailand	1.79^{NS}	-2.88**	-2.33*
Vietnam	9.23*	0.93^{NS}	1.44^{NS}

Source: FAO

*and ** : Significant at p = 0.01 and p = 0.05 respectively

NS : not significant

leading to lower supplies and recovered its exports in the later years. Economic concerns in EU and US markets affected the demand for shrimp, since shrimp is a high value commodity.

The general slump in the shrimp prices happened due to increased supply of cultured shrimp to the world leading to lower unit value realisation by the exporters. The trade related issues such as antidumping duties by USA against India, Ecuador, Vietnam and China, presence of unapproved chemical contaminations in the exports from China as reported by FDA in 2007, EU decision to tighten the imports from India, US ban of wild caught Mexican shrimp imports demanding seaturtle protection and antibiotics scare in the exports from Vietnam and Indonesia in 2007 also plagued the shrimp industry in the decade 2000-2010 (Globefish, 2010). On the whole, unit value of shrimp exports decreased during 2001-2010, which could be attributed to the global economic slowdown, imposition of antidumping duties by USA and increased global supply triggered by the increase in the supply of cultured shrimp which is cheaper than the wild caught shrimp, whereas the increase in the volume of trade has led to overall rise in the value of trade.

Export competitiveness of Indian shrimp exports

The export competitiveness index for Indian shrimp shows that the major exporters have seen both gains and losses in the world shrimp market. The exports of Vietnam seem to be more stable as compared to other countries (Table 9).

Revealed competitiveness index of shrimp exports

For India, the years 2006, 2007 and 2008 have found to be less competitive with lower index values. However the value has moved up in 2009 owing to higher exports. India's seafood exports performed well from 1991-2000 as compared to 2001-2009. The RCI takes into account both the imports and exports of shrimp and the values show that India is fairly competitive in its shrimp exports as compared to Argentina, China and Denmark. However Ecuador, Indonesia, Thailand, Vietnam and Indonesia appear to be more competitive in the shrimp market. In 2008 and 2009, the revealed competitiveness index for India declined. Fathima *et al.* (2006) also highlighted a decline in the export competitiveness in Indian shrimp exports and emphasised on export market research, diversification of fishing area and market destinations and products in order to sustain the shrimp exports. Similar trend was also noticed in the case of China, Denmark, Greenland and Indonesia (Table 10).

Shrimp dominates the seafood trade of India and Indian shrimp exports have proved to be competitive in the world export market. The export competitiveness

index indicates that there is a need for policy measures to sustain the exports over the years. Seafood being highly perishable in nature and prone to contaminations, there is a need to keep the industry in sync with the changing quality regulations in the world market, especially in respect of the key markets like EU and USA. Issues like antidumping duties imposed by USA as well as stagnant demand due to global slowdown have affected the net gains of the exporters. Dynamic market changes have been noticed in terms of increasing share of Middle East countries in Indian exports. However, the exports are further processed in these countries for reexporting the same. Since, the major exporting firms have already invested a huge amount on upgradation of facilities to meet the safety requirements; India can also take up high end processing and value addition, which will help to enhance the opportunities of import and reexport of shrimp as done in countries like China and Thailand. This will also help in effective utilisation of processing facilities to realise higher unit value. The Food Safety Monitoring Act of FDA approved on January 2011, has proposed increased testing of shipments, foreign food safety testing equivalence, facility testing and federal state partnership for inspection. In the wake of widening markets and integration of economies, these challenges have to be met through appropriate policy measures to sustain the competitiveness of Indian shrimp exports.

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Table 9. Export competitiveness index for shrimp in major shrimp exporting countries

Year	Argentina	China	Denmark	Ecuador	Greenland	India	Indonesia	Mexico	Thailand	Vietnam
1991	1.17	0.66	0.94	1.20	0.83	1.21	1.01	1.00	1.19	1.39
1992	2.06	1.13	0.91	1.01	0.92	0.95	0.95	0.74	1.15	1.19
1993	0.97	0.64	0.82	0.82	0.90	1.24	1.08	1.62	1.14	1.18
1994	0.67	0.80	0.85	1.00	0.73	1.11	0.94	0.93	1.09	1.03
1995	0.53	0.17	0.19	0.12	0.31	0.81	0.07	0.20	0.03	0.20
1996	1.23	3.24	6.37	9.60	4.10	1.11	12.98	6.00	37.70	4.02
1997	0.53	1.25	0.85	1.33	0.68	1.05	0.99	1.20	0.97	1.43
1998	3.84	0.84	1.04	1.00	0.92	0.96	1.00	1.02	0.94	1.17
1999	0.73	1.09	0.92	0.74	1.07	1.08	0.91	0.90	1.03	1.11
2000	1.86	1.40	1.10	0.40	0.84	1.02	1.11	0.96	1.05	1.22
2001	1.59	1.27	0.87	1.09	0.93	0.94	0.98	1.01	0.86	1.10
2002	0.70	1.40	1.17	0.94	1.03	1.18	0.93	0.70	0.81	1.08
2003	1.35	1.28	1.04	0.97	1.18	0.88	0.89	0.93	0.89	1.20
2004	0.54	1.13	1.20	1.11	0.95	0.90	1.03	1.07	0.92	1.09
2005	0.36	0.96	1.04	1.28	1.05	1.06	1.00	0.88	0.98	1.11
2006	4.02	1.12	0.96	1.20	0.83	0.94	1.08	0.96	1.17	0.95
2007	0.77	0.94	0.99	1.00	0.70	0.91	0.85	1.12	1.02	1.10
2008	1.28	1.05	1.07	1.09	1.29	0.89	1.12	0.85	1.03	0.99
2009	0.87	1.11	0.81	1.00	1.06	1.00	0.93	1.07	1.11	1.07

Source: FAO

Table 10. Revealed competitiveness index for shrimp exports by major countries

Year	Argentina	China	Denmark	Ecuador	Greenland	India	Indonesia	Mexico	Thailand	Vietnam
1991	1.51	4.38	-0.69	2.07	0.80	1.90	5.15	3.44	2.07	2.24
1992	1.99	3.86	-0.65	2.29	0.61	1.76	2.82	1.59	2.59	2.25
1993	1.39	3.54	-0.47	5.17	2.03	1.85	4.96	1.83	2.86	2.30
1994	0.26	2.18	-0.25	6.02	0.28	3.63	6.33	2.20	2.64	2.36
1995	-0.44	1.99	-0.39	5.28	1.57	1.79	4.16	1.81	2.58	4.70
1996	-0.35	1.59	-0.32	4.45	0.16	5.23	3.81	1.59	2.59	3.33
1997	-1.00	2.00	-0.16	4.74	0.03	4.53	2.58	1.46	2.11	4.60
1998	0.51	1.46	-0.04	4.03	2.42	1.78	2.26	0.15	2.05	2.07
1999	0.00	1.33	-0.09	5.61	2.33	1.74	2.10	1.74	2.26	3.36
2000	1.01	1.05	0.11	5.25	2.32	3.99	2.84	1.64	2.11	0.50
2001	2.48	0.67	0.05	5.10	3.13	3.41	3.18	0.81	1.97	1.03
2002	3.24	0.88	0.11	5.22	1.74	2.81	2.29	0.09	1.62	0.48
2003	3.24	1.10	0.23	4.37	1.84	3.79	1.62	0.14	1.64	1.10
2004	2.69	1.53	0.20	4.47	3.45	3.26	0.38	1.21	2.14	0.93
2005	0.43	1.60	0.15	4.68	2.05	2.77	2.71	0.74	2.31	1.77
2006	1.17	1.49	0.11	5.65	0.30	2.47	3.39	0.62	2.51	1.90
2007	1.87	1.69	0.26	5.43	2.24	2.08	2.00	0.55	2.74	2.06
2008	1.51	2.05	0.15	6.03	2.29	1.77	2.67	0.01	2.69	1.66
2009	1.77	1.90	0.10	6.76	2.21	1.65	2.29	0.16	2.83	2.25

Source: FAO

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