Export performance of Indian cashewnut – An analysis

S. S. Guledgudda[1⊠], B. L. Patil[2] and B. C. Rajur[3]

[1]RARS, Bijapur-586 101, Karnataka, India.
[2,3]Department of Agricultural Economics, University of Agricultural Sciences, Dharwad -580 005, Karnataka, India

⊠Corresponding author: sguledgudda@gmail.com

Abstract

The Indian Cashew industry provides employment to more than 5 lakh people both directly and indirectly, particularly in the rural areas and it thus plays a very vital role in the economy. Today nuts constitute an important part of diet in several countries of the world. In Indian cashew processing factories, over 95% of the workers are women. The total export earnings from export of cashew kernel and cashew nut shell liquid has increased from ₹ 447.80 crores in 1990-91 to ₹ 4390.68 crores in 2011-12. India is facing tough competition from Vietnam and Brazil in the exports of Cashew Kernels. The NPC for the period 2004 under exportable hypothesis was 0.98, which also revealed that the domestic prices received by the farmers were lower than the international prices, which also implied that the domestic producers were disprotected or rather taxed compared to a situation prevailing under free trade condition. USA was one of the most stable countries among major importers of Indian cashew kernel as indicated by the high retention probability of 70.49%. India could not retain the previous export share to Singapore.The major competitors for India in the world market are Vietnam, Brazil, Indonesia and Tanzania. A dependency on one or two export market would increase the trade risk in the near future. Hence, appropriate export promotion strategies are to be evolved to diversify the geographical concentration.

Keywords: Nominal protection coefficient, export growth, cashew industry, export demand, free trade

Agricultural exports potential is quite high in India. Agricultural exports have been remained as backbone of India's export and continued to be the bacon for future export growth. Agricultural exports are contributing around 18.18% to India's total export earnings and also play a significant role in employment generation, particularly in the rural sector. The Indian Cashew industry is almost export oriented.

India does not produce sufficient quantities of raw cashew required for export demand and has to resort to import to the tune of 250 lakh tonnes of raw cashewnut annually. India is the major importer of raw cashewnut in the world, and import of raw cashewnut increased steadily to reach 5,78,884 metric tonnes valued at ₹ 1400.93 crores in 2004-05. It's import in 1990-91 was only 82,639 metric tones valued at ₹ 134.00 crores. Net foreign exchange earnings from cashew export was ₹ 313.80 crores in 1990-91, which increased to ₹ 410.52 crores in 2003-04. The total export earnings from export of cashew kernel and cashew nut shell liquid has increased from ₹ 447.80 crores in 1990-91 to ₹ 2905.82 crores in 2009-10. India is facing tough competition from Vietnam and Brazil in the exports of Cashew Kernels (Velavan, 2004). The present study was undertaken to analyse the Export competiveness and trade direction of Indian cashewnut.

Materials and Methods

Nominal Protection Coefficient (NPC)

Nominal Protection Coefficients were computed to determine the extent of competitive advantage enjoyed by the commodity in the context of free trade. The coefficients had highlight on whether a

country has comparative advantage in the export of that commodity in a free trade scenario or not.

The Nominal Protection Coefficient was worked out by dividing domestic price of cashew kernels by world reference price. Calculated domestic price could be considered as farm gate price or procurement price. International price adjusted for various costs involved in marketing of cashewnut like transportation cost, export charges, packing *etc.*

Symbolically, NPC = Pd / Pr

Where,

NPC = Nominal protection coefficient

Pd = Domestic price of the cashew in question

Pr = World reference price of the cashew in question *i.e.* what the farmer would have received in case of free trade.

The wholesale price was taken as the price of Mangalore market because it gives a better representation of the prices of export quality cashew as compared to the wholesale price of Karnataka. For the world reference price, the price of New York market was taken because New York is one of the major markets of cashew and also because of the unavailability of data of any other market. Estimation of world reference price entails adding freight charges, insurance charge, trading margins, transportation cost *etc.* from New York market/USA to Chennai port. The resulting international price is compared with domestic price.

If the nominal protection coefficient is greater than one, then the commodity is protected, compared to the situation that what would prevail under free trade and if it is less than one the commodity is disprotected.

NPC basically helps in measuring the divergence of domestic price from the international price and thus determines the degree of protection (incentive)/ disprotection (disincentive) of the commodities in question. NPC can be estimated under two main scenarios, *i.e.*, under importable scenario and under exportable scenario. If one is interested in knowing whether a particular commodity is an efficient import substitute, it is the importable scenario, which is more relevant. If the NPC under this scenario is less than the unity, the commodity is an

efficient import substitute. And, if one is interested in knowing whether a particular commodity is an efficient exportable commodity, it is the exportable scenario, which is more relevant.

Under the importable scenario, competition is deemed to take place at domestic port and therefore international transportation costs accord a natural protection to domestic commodity. While, under exportable scenario, competition is assumed to take place at foreign port and therefore domestic commodity has to be extra efficient to be in tune with the international transportation costs at least. The two hypotheses, therefore, yield different estimates of protection.

(a). The point of competition between domestic production and imports from US Gulf was taken for the importable hypothesis.

The international reference price under this hypothesis would thus be calculated by adjusted the FOB (Free On Board) price at Mumbai/Chennai port by adding insurance and maritime freight from US Gulf to the relevant Indian port (Mumbai/Chennai), then by adding domestic transport costs, marketing and trading margins to the Indian port to the specific region. The resulting international reference price is compared with the domestic price (domestic price were approximated by wholesale prices of the country), to derive the NPC of cashew kernel.

(b). under exportable hypothesis, the presumption is that Indian cashew kernel would compete with cashew kernel in USA. Since competition is assumed to taken place in US Gulf estimation of the international reference price calls for adding marketing margins, insurance, port clearing charges *etc.*, to CIF (Cost, Insurance and Freight) price at US Gulf.

(c). Freight and other adjustments for cashew kernel.

The first requirement of NPC calculation is the calculation of the reference price of relevant foreign cashew kernel under both importable and exportable hypotheses. Cashew kernel prices (international) published by 'The Cashew' journal were collected for the period 2004-05. Transportation costs and port clearing charges are approximated in line with Gulati *et al* (1990) and the information given by the cashew kernel exporters of Mangalore.

Markov chain analysis

The trade directions of Indian cashew exports was analysed using the first order Markov chain approach (Jayesh, 2001).

Markov chain analysis was used to find out transitional probability matrix P. The probability of starting of export from i to j country as time proceeds is indicated by the elements Pij of the matrix P. Probability of export share of a country is measured by diagonal elements of the matrix. However, six major importing countries along with other countries as a whole is considered. Since random variables depend exclusively on previous exports to particular country, an average export to a particular country is considered as random variable.

In order to estimate the transitional probability, Minimum Absolute Deviations (MAD) estimation procedure was employed. To satisfy the properties of transitional probabilities of non-negativity restrictions and row sum constraints in estimating the conventional linear programming technique was employed.

Table 1. NPC of raw cashew imports (2004-05)

Sl. No.	Particulars	Unit	Value
1	FOB Price (in US)	$ / Qtls	606.26
2	Plus freight from US to India	$ / Qtls	3.41
3	Plus insurance at 2% of price	$ / Qtls	12.13
4	Equals CIF price(1+2+3)	$ / Qtls	621.80
5	Exchange rate	1 $ = ₹	44.00
6	Equals CIF price (row4*row5)	₹/Qtls	27358.99
7	Plus port clearing charges (Chennai)	₹/Qtls	120.10
8	Equals landed cost(6+7)	₹/Qtls	27479.09
9	Plus transport cost (Mangalore)	₹/Qtls	51.10
10	Equals landed cost(8+9)	₹/Qtls	27530.19
11	Reference price (9+10)	₹/Qtls	27581.29
12	Whole sale price of C.K.	₹/Qtls	24314.00
13	NPC (row 12 / row 11)		0.88

Results and Discussion

Export competitiveness of Indian cashew kernel

The nominal protection coefficient explains the comparative advantage engaged by commodities in the context of free trade regime. The analysis of export competitiveness in general, indicated that all the commodities were found to be competitive for their export to other countries as was evident from NPCs of less than unity. The NPCs for cashew kernel have been estimated both under the importable and exportable hypothesis.

Table 2. NPC of cashew kernel exports (2004-05)

Sl. No.	Particulars	Place	Unit	Value
1	Wholesale price of cashew kernel	Mangalore	₹/ Qtls.	24314.00
2	Plus transport cost to	Chennai	₹/ Qtls.	51.10
3	Plus marketing margin (5%)		₹/ Qtls.	1215.70
4	Plus Port clearing and handling charges		₹/ Qtls.	120.10
5	Equal FOB Price(1+2+3+4)	Chennai	₹/ Qtls.	25700.90
6	Plus Freight charge		₹/ Qtls.	194.00
7	Plus insurance at 2% of price		₹/ Qtls.	486.28
8	Equals landed cost (5+6+7)	US	₹/Qtls	26381.18
9	Exchange rate		1$=Rs	44.00
10	CIF price (row 8 / row 9)		US $ / Qtl	599.57
11	Reference price	US	US $ / Qtl	606.26
12	NPC of cashew kernels (row 10/row 11)			0.98

The NPCs for cashew kernel under importable and exportable hypothesis were calculated for the period 2004-05 and results presented in Tables 1 and 2 respectively. It reveals that under importable hypothesis, if domestic price was lower than international price plus freight, insurance, transportation and other costs involved in taking the produce from foreign market to domestic market then the produce was import competitive. Table 1 revealed that the NPC value under importable hypothesis for the period 2004-05 worked out to be 0.88 implied that the domestic prices received by

Table 3. Transitional probability matrix of cashew kernel exports (1991-2003)

Country	U.S.A	Netherlands	Japan	Australia	U.K.	Singapore	Others
U.S.A	0.70498	0.00000	0.00000	0.00000	0.01582	0.00000	0.27920
Netherlands	0.46678	0.34813	0.00000	0.00000	0.18509	0.00000	0.00000
Japan	0.00000	0.58172	0.28088	0.00000	0.00000	0.13740	0.00000
Australia	0.00000	0.00000	0.33143	0.49546	0.00000	0.17310	0.00000
U.K.	0.34610	0.12243	0.32844	0.05166	0.15137	0.00000	0.00000
Singapore	0.00000	0.57329	0.13702	0.28969	0.00000	0.00000	0.00000
Others	0.17209	0.23244	0.07236	0.00000	0.05625	0.00000	0.46686

Table 4. Actual and estimated export shares of Indian cashew kernels to major importers

(₹ Crores)

Year	USA A	USA E	Netherlands A	Netherlands E	Japan A	Japan E	Australia A	Australia E	UK A	UK E	Singapore A	Singapore E	Others A	Others E
1991	199.8 (29.86)		196.7 (29.40)		64.03 (9.57)		35.50 (5.31)		23.50 (3.51)		23.70 (3.54)		125.87 (18.81)	
1992	199.80 (31.70)	255.79 (40.58)	196.7 (31.21)	142.43 (22.60)	64.03 (10.16)	47.02 (7.46)	35.5 (5.63)	25.67 (4.07)	23.5 (3.73)	48.02 (7.62)	23.7 (3.76)	14.94 (2.37)	87.1 (13.82)	96.45 (15.30)
1993	325.50 (43.66)	343.61 (46.09)	168.5 (22.60)	130.58 (17.52)	55.6 (7.46)	52.73 (7.07)	27.5 (3.69)	22.24 (2.98)	56.8 (7.62)	50.11 (6.72)	19.6 (2.63)	12.40 (1.66)	92 (12.34)	133.83 (17.95)
1994	431.40 (41.24)	461.38 (44.11)	217.3 (20.77)	183.72 (17.56)	81.2 (7.76)	76.67 (7.33)	45.9 (4.39)	31.27 (2.99)	70.3 (6.72)	67.98 (6.50)	16.9 (1.62)	19.10 (1.83)	183 (17.50)	205.88 (19.68)
1995	459.90 (36.90)	503.24 (40.38)	213.7 (17.15)	225.58 (18.10)	91.4 (7.33)	95.43 (7.66)	63.5 (5.10)	41.83 (3.36)	66.1 (5.30)	75.26 (6.04)	24 (1.93)	23.55 (1.89)	327.68 (26.29)	281.39 (22.58)
1996	350.80 (28.28)	439.76 (35.45)	209.8 (16.91)	257.85 (20.78)	100.5 (8.10)	95.65 (7.71)	50.1 (4.04)	33.85 (2.73)	42.9 (3.46)	76.92 (6.20)	23.5 (1.89)	22.48 (1.81)	463 (37.32)	314.10 (25.32)
1997	455.60 (35.45)	547.42 (42.59)	321.5 (25.01)	261.69 (20.36)	99.1 (7.71)	84.37 (6.56)	17.9 (1.39)	21.44 (1.67)	79.7 (6.20)	94.66 (7.36)	29.2 (2.27)	16.72 (1.30)	282.3 (21.96)	259.00 (20.15)
1998	536.00 (38.39)	614.74 (44.03)	332.8 (23.84)	259.82 (18.61)	97 (6.95)	93.16 (6.67)	35.1 (2.51)	27.61 (1.98)	95.7 (6.85)	100.38 (7.19)	18.2 (1.30)	19.40 (1.39)	281.3 (20.15)	280.98 (20.13)
1999	722.00 (44.28)	745.75 (45.74)	303.4 (18.61)	269.47 (16.53)	108.7 (6.67)	108.26 (6.64)	40.1 (2.46)	32.27 (1.98)	117.2 (7.19)	103.15 (6.33)	21.9 (1.34)	21.88 (1.34)	317.1 (19.45)	349.63 (21.44)
2000	1232.80 (47.98)	1244.99 (48.45)	502.6 (19.56)	394.11 (15.34)	137.5 (5.35)	152.85 (5.95)	45.9 (1.79)	40.88 (1.59)	195.8 (7.62)	166.19 (6.47)	27.7 (1.08)	26.84 (1.04)	427.2 (16.63)	543.64 (21.16)
2001	923.60 (45.06)	954.66 (46.58)	380.1 (18.54)	336.21 (16.40)	122 (4.95)	123.55 (6.03)	17.3 (0.84)	23.26 (1.13)	148.7 (7.25)	131.87 (6.43)	24.2 (1.18)	19.76 (0.96)	433.8 (21.16)	460.40 (22.46)
2002	887.50 (49.62)	857.72 (47.95)	255.6 (14.29)	257.51 (14.40)	78.7 (4.40)	100.66 (5.63)	14.7 (0.82)	20.75 (1.16)	125.6 (7.02)	103.00 (5.76)	24.1 (1.35)	13.36 (0.75)	402.5 (22.50)	435.70 (24.36)
2003	1015.89 (52.55)	944.33 (48.85)	244.69 (12.66)	256.49 (13.27)	80.34 (4.16)	97.62 (5.05)	22.42 (1.16)	19.06 (0.99)	100.73 (5.21)	102.45 (5.30)	9.48 (0.49)	14.92 (0.77)	459.48 (23.77)	498.15 (25.77)
2004		840.41 (46.57)		266.61 (14.78)		98.69 (5.47)		9.78 (0.54)		96.15 (5.33)		14.77 (0.82)		478.01 (26.49)
2005		832.47 (46.13)		281.57 (15.60)		99.16 (5.50)		14.09 (0.78)		104.08 (5.77)		15.25 (0.85)		457.81 (25.37)
2006		833.11 (46.17)		283.61 (15.72)		101.92 (5.65)		16.78 (0.93)		106.79 (5.92)		16.06 (0.89)		446.16 (24.73)

Year													
2007	833.45 (46.19)	284.01 (15.74)	103.75 (5.75)	18.48 (1.02)	106.93 (5.93)	16.91 (0.94)	440.90 (24.43)
2008	833.02 (46.17)	284.49 (15.77)	104.61 (5.80)	19.58 (1.09)	106.73 (5.92)	17.45 (0.97)	438.54 (24.30)
2009	832.47 (46.13)	284.90 (15.79)	105.05 (5.82)	20.27 (1.12)	106.66 (5.91)	17.76 (0.98)	437.32 (24.24)
2010	832.03 (46.11)	285.19 (15.80)	105.33 (5.84)	20.70 (1.15)	106.64 (5.91)	17.94 (0.99)	436.59 (24.20)

Note: Figures in the parentheses indicate percentages. A- Actual, E-Estimated

the farmers were below the international prices and cashew cultivators in Karnataka were disprotected to the extent or in effect taxed in the pricing front compared to the free trade situation. Revealing the fact that cashew kernel was a good import substitute. The findings thus were implied that domestic prices received by farmers were below the international prices and the cashew cultivators of Karnataka were net taxed on the pricing front compared to the free trade situation. Similar results were obtained by Mahesh (2000) for tea production in Karnataka.

The NPC for the period 2004 under exportable hypothesis was 0.98, which also revealed that the domestic prices received by the farmers were lower than the international prices, which also implied that the domestic producers were disprotected or rather taxed compared to a situation prevailing under free trade condition. It also revealed that cashew kernel export had a high degree of comparative advantage in the world market, but for the trade barriers delinking the domestic and world market. The barriers included the various policy measures pertaining to cashew implemented by the government such as tax on raw cashew nut while importing and on cashew kernel export. Thus, India had a great advantage to specialize the production of raw cashew nut and to export the surplus production to earn valuable foreign exchange. India needs to capitalize this advantageous position by ensuring its position in the international market as a stable and dependable source of exportable quality cashew. There is also an urgent need to enhance the productivity levels of cashew so that cost of production can be minimized and thereby the comparative advantage could be increased. Similar results were obtained by Mruthyunjaya and Chauhan (2003). It is worth noting that the growth rates in exports of cashew kernel were increasing over a period of time on one hand and they were also export competitive on the other. Thus, the country had a comparative advantage in the export of cashew products too and this can be achieved by concerted efforts of government by providing incentives to the cashew producers as export graded variety of cashew and infrastructure facilities to export the cashew.

Direction of Trade and Changing pattern of cashew exports

The global demand for cashew has been on the increasing trend over the years. Indian cashew is very popular in the world market for the table purpose, due to its delicious, pleasant taste and nutritive value. It is an ideal appetizing snack and a complete food in harmony with a modern diet. It contains good source of protein, vitamin and minerals. All parts of the cashew tree are made use of in one way or the other. Since India is a major exporter of cashew kernel, it becomes necessary that India meats international quality requirements of cashew not only to retain the export market but also to increase its export earnings in terms of quantity at the desired quality in coming years. Moreover, consumers worldwide are linking purchase of food items to greater awareness of health. Therefore, with the growing consumer taste the world over for organically produced food with natural flavour; Indian cashew has better export opportunity. The major competitors for India in the world market are Vietnam, Brazil, Indonesia and Tanzania.

The dynamics of changes in the export trade of Indian cashew products were analyzed using Markov transitional probability matrix. Estimation of transitional probability matrix is central to the Markov chain analysis. The probability of

retaining the previous market shares and gain or loss is interpreted by studying the diagonal and off-diagonal elements of the matrix. Making use of Markov Chain Analysis, the direction of trade in cashew exports from India was studied through the probability of market share retention, gain / loss which is presented in transitional probability matrices furnished in Tables 2 and 4.

Direction of Trade of cashew kernel export

It is evident from Table 3 that the USA was one of the most stable countries among major importers of Indian cashew kernel as indicated by the high retention probability of 70.49%. India could not retain the previous export share to Singapore. Similar interpretation can be made for Australia, with probability of retention of 49.54 per cent, other countries with the retention probability of 46.6 per cent, Netherlands with the retention probability of 34.81 per cent, Japan with the retention probability of 28.08% and United Kingdom with the retention probability of 15.13%. On the contrary, Singapore was having probability retention of zero indicating that it was unstable importer of Indian cashew kernel. This might be due to lowered import demand for Indian cashew due to tough competition in the world market from other exporters like Vietnam and Brazil, which reveals ample scope to improve the productivity and quality of raw cashewnut in our country. In addition to this, the concerned authorities need to take initiatives to popularize our products in other importing countries, not only by concentrating on a few countries, but by participating in International trade fairs and projecting the higher quality of our produce, over other countries, especially in case of

USA, as there was higher preference for the good quality of Indian cashew. This is reflected in the fact that India's share in total import of cashew by USA is around 48.85% during 2003-04. A dependency on one or two export market would increase the trade risk in the near future. Hence, appropriate export promotion strategies are to be evolved to diversify the geographical concentration.

References

Ashalatha, 2000. Export Trade Performance of Indian Cashew. *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Bangalore.

Gulati, A., Sharma, A. and Sharma, C., 1994. Export Competitiveness of Selected Agricultural Commodities. *Unpublished NCAER Report*, New Delhi, pp. 84- 238.

Jayesh, T., 2001, Production and Export Performance of Selected Spices in South India: An Economic Analysis. *M. Sc. (Agri.) Thesis,* University of Agricultural Sciences, Dharwad.

Mahesh, N., Keshava Reddy, T. R. and Lalitha Achoth, 2000. An Empirical Analysis of Growth and Instability of Indian Tea Industry. *Agricultural Banker* **24**(2): 25-27.

Mamatha, B.G., 1996. Techniques for measuring export competitiveness of agricultural commodities. *Seminar Report,* Department of Agricultural Economics, University of Agricultural Sciences, Bangalore.

Miruthyunjaya and Chauhan, S. 2003. Competitiveness of Indian Farm Produce in Global Market. *Paper Presented in National Seminar on Competitiveness of Indian Farm produce in Global Market*, National Institute of Rural Development, Rajendranagar, Hyderabad.

Nirban, A. J. and Sawant, P.A., 2000. Constraint Analysis of Cashew nut Growers. *The Cashew* **14**(1): 45-49.

Velavan, C., 2004. Performance of Cashew – A Growth Rate Analysis. *The Cashew* **18**(3): 27-31.