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Trend and competitiveness of pomegranate in domestic and international prices

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Abstract

The present study was conducted to assess the trend and competitiveness in domestic and international of pomegranate. Trend and Competitiveness of pomegranate in domestic and international prices to analyse the time series data for 15 years collected from APEDA and Agmarknet. The lowest variation in export quantity and value was observed in UAE i.e. 34.99 per cent and 36.80 per cent respectively. Trend in domestic price and international price of pomegranate was increasing at increasing rate. There was no stability in export quantity and value of pomegranate from India throughout the study period. The NPC value of pomegranate showed that in period I with average NPC value as 0.91 and NPC value for the period II was 1.11, period III was 0.56 and for overall period it was 0.74 which indicate moderate export competitiveness in international market. Indian Pomegranate has better competitiveness in International market is accepted.

Keywords: Compound growth rate, coefficient of variation, trend analysis and nominal protection coefficient

Introduction

Pomegranate (*Punica granatum* L.) belongs to family *Punicaceae* and is a favorite table fruit of the tropical and sub-tropical regions of the world. Pomegranate cultivation was started since ancient time. The fruit is native of Iran and extensively cultivated in Mediterranean countries like Spain, Egypt, Iran, Burma, China and India. In India, pomegranate is cultivated in the states of Maharashtra, Gujarat, Karnataka, Tamil Nadu, Uttar Pradesh, Haryana and Andhra Pradesh. It is also cultivated in parts of Arizona and California.

The total production of pomegranate is concentrated mainly in the Western Maharashtra, Karnataka, Andhra Pradesh, Gujarat, Himachal Pradesh, Tamil Nadu and Rajasthan in India. The production of pomegranate in India during 2017-18 was 2670.67 ('000 MT). Maharashtra is the leading State with 151.5 thousand hector area under pomegranate cultivation, followed by Karnataka and Gujarat with 29.1 thousand ha and 22.2 thousand ha respectively, Andhra Pradesh and Rajasthan stood at fourth and fifth position with 7.71 and 2.5 thousand ha of pomegranate cultivation in India. India is the largest producer of pomegranates but export from India fresh fruit during 2017-18 was 1.85 per cent of the total share in world compared to Thailand and Vietnam soc rep which exports 28.37 and 23.73 per cent share in world, respectively of their production. To increase exports, it is necessary to improve the quality at various stages from production, post-harvest, processing and handling, storage and till it reaches the customers.

The fruit is exported to UAE, Saudi Arabia, Netherlands, Oman, Nepal, USA, Kuwait, UK, and Others country. India ranks first in area (220,000 ha) with a production of 2670.67 ('000 MT), but exports quantity 47.33 (MT), including 1.7 per cent export from India to rest of countries. The first season for harvesting pomegranates begins during July-September, while the second harvest season commences in January-February. The export season of the fruit starts in November every year and continues till March-end.

Methodology

The study is based on time series data on production and export of pomegranate from India obtained from various published issues of APEDA and other government publication for a period of 2003-04 to 2017-18. The total period (2003-04 to 2017-18) was split into three periods viz., period I (2003-04 to 2007-08), period II (2008-09 to 2012-13), period III (2013-14 to 2017-18). For the present study analytical tool Compound Growth Rate, Coefficient of Variation (CV), Trend Analysis and Nominal Protection Coefficient (NPC) was used.

Growth rates analysis

$$Y = a \cdot b^t$$

Where,

Y = Production/Export quantity/Export value of pomegranate

t = Time variable, b = Regression Coefficient

a = Intercept

The compound growth rates 'r' was computed by using the following formula.

$$CGR (r) = [\text{Antilog}(\log b) - 1] * 100$$

Where,

r = Compound growth rate

Coefficient of variation (CV)

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{X}} * 100$$

$$S = \frac{\sqrt{\sum(X - \bar{X})^2}}{n}$$

Where,

σ = Standard deviation, \bar{X} = Arithmetic means.

X = Variable, n = Number of observations

Trend analysis

$$Y_t = a + bt + ct^2$$

Where,

Y_t = Domestic / International Price, a = intercept, t = Time

b, c = Partial Regression Coefficient

Nominal protection coefficient (NPC)

$$NPC = P_d/P_r$$

Where,

P_d = Domestic price of commodity

P_r = World reference price of the commodity

Result**Country wise export performance of pomegranate during (2003-04 to 2017-18)**

Country wise export performance of Pomegranate during (2003-04 to 2017-18) was presented in the Table 1, it was revealed that, highest growth rate of pomegranate exported quantity to Kuwait from India was 42.22 per cent which is significant at 1 per cent level, whereas lowest growth rate for export of pomegranate was found in Netherland i.e. 3.54 per cent. Second highest growth rate of quantity of pomegranate exported to USA from India was 22.96 per cent which is significant at 1 per cent level. The highest growth rate in case of total value of pomegranate exported was found in USA i.e. 63.24 per cent, whereas lowest was found in UK i.e. 8.01 per cent which is significant 1 per cent level.

Second highest and lowest growth rate of total value of pomegranate exported was Kuwait i.e. 61.25 per cent and Netherland i.e. 13.43 per cent, respectively which is significant 1 per cent level. Followed by growth rate of total value of pomegranate exported was found in Nepal, Oman, U.A.E. and Saudi Arab i.e. 31.24, 30.57, 28.04 and 27.03, respectively. The highest and lowest variation in case of quantity of pomegranate export was found in Netherland and U.A.E. i.e. 107.35 and 34.99 per cent, respectively. The second highest and lowest variation in quantity of pomegranate export was found in Nepal i.e. 98.35 per cent and Saudi Arab i.e. 49.44 per cent, respectively. The second highest and lowest variation in quantity of pomegranate

export was found in Nepal i.e. 98.35 per cent and Saudi Arab i.e. 49.44 per cent, respectively. Followed by in case of highest variation of quantity of pomegranate export was in Kuwait, Oman and UK i.e. 92.87, 90.45 and 60.81 per cent, respectively.

It was also showed that, the highest variation in case of total value of pomegranate export was found in Oman i.e. 152.56 per cent, where was lowest in UK i.e. 36.80 per cent. Followed by variation of total value of pomegranate export was in U.S.A, Nepal, Kuwait, Saudi Arab, U.A.E. and Netherland i.e. 144.21, 126.83, 125.04, 96.11, 92.75 and 82.73 per cent, respectively. Growth rate of India for pomegranate export was found i.e. 8.12 per cent which is statistically Significant at 1 per cent level and variation was i.e. 40.53 per cent.

Trend in domestic and international prices of pomegranate

The trend in international prices was studied for Pomegranate by regressing domestic price and international price with time as the variable. The quadratic function is fitted to the data and sign and significant of the quadratic coefficient 'c' indicate the magnitude and direction of the change in trade in international price. The results of the quadratic function are presented in Table 2. The analysis of trends in international prices of Pomegranate shows that, the quadratic function fitted for Pomegranate for domestic price and international price.

The R² value (0.83) was statistically significant for Domestic price. However, sign of 'b' was positive (0.04) and sign of quadratic term 'c' was positive (0.002) this indicates that, trend in domestic price of Pomegranate was increasing at increasing rate. Also, for international price value of R² (0.71) was statistically significant and the sign of 'b' was positive (0.08) and sign of quadratic term 'c' was positive (0.0072) this showed that, trends in international price of Pomegranate was increasing at increasing rate.

Export competitiveness of pomegranate in India

The competitiveness of market depends upon NPC ratio. NPC shows that the divergence of domestic price from international price and thus determines the degree of export competitiveness of commodity was presented in Table 3. When NPC ratio is less than 0.5, market is highly competitive, when NPC ratio is in between 0.5 to 1, the market is moderately competitive and when NPC ratio is greater than one, then market is non- competitive at an overall level, the NPC values of Pomegranate export was worked out to 0.74, it is indicating moderately export competitiveness of Pomegranate in international level and proves commodity is protected in international market but when it was analyzed for the four different periods in period I, period II period III and overall period. It was observed that, the crop was during the period I, period II period III and overall period average NPC values was 0.91, 1.11, 0.56 and 0.74, respectively which indicates highly export competitiveness for period III. Hence, the hypothesis i.e. Indian Pomegranate has better competitiveness in International market is accepted.

Trend in domestic price and international price of pomegranate was increasing at increasing rate. The crop during the period I, II, III and overall period average NPC values was 0.91, 1.11, 0.56 and 0.74, respectively which indicates moderate export competitiveness for period III.

Table 1: Country wise export performance of Pomegranate during (2003-04 to 2017-18)

Sr. No	Country	Quantity		Value	
		CGR	CV	CGR	CV
1	U.A.E	7.85*	34.99	28.04*	92.75
2	Saudi Arab	9.68*	49.44	27.03*	96.11
3	Netherland	3.54	107.35	13.43*	82.73
4	Oman	11.07*	90.45	30.57*	152.56
5	Nepal	13.65*	98.35	31.24*	126.83
6	USA	22.96*	96.61	63.24*	144.21
7	Kuwait	42.22*	92.87	61.25*	125.04
8	UK	-10.29	60.81	8.01*	36.80
9	Other	10.29*	6.36	25.30*	81.79
10	India (Total)	8.12*	40.53	24.21*	85.72

Note- (*, ** - denotes significant at 1%, 5% level, respectively)

Table 2: Trend in Domestic and International prices of Pomegranate

Sr. No.	Trend	Intercept (a)	X (b)	X ² (c)	R ²	F value
1.	Domestic Price	5.21	0.04	0.002	0.83*	68.06
2.	International Price	4.94	0.08	0.0072	0.71*	32.01

Table 3: Export Competitiveness of Pomegranate

Sr. No.	Particulars	NPC (Pd/ Pr)
1	Period I (2003-04 to 2007-08)	0.91
2	Period II (2008-09 to 2012-13)	1.11
3	Period III (2013-14 to 2017-18)	0.56
4	Overall Period (2003-04 to 2017-18)	0.74

Conclusion

1. The lowest variation in export quantity and value was observed in UAE i.e. 34.99 per cent and 36.80 per cent, respectively.
2. Trend in domestic price and international price of pomegranate was increasing at increasing rate.
3. There was no stability in export quantity and value of pomegranate from India throughout the study period.
4. The NPC value of pomegranate showed that in period I with average NPC value as 0.91 and NPC value for the period II was 1.11, period III was 0.56 and for overall period it was 0.74 which indicate moderate export competitiveness in international market.
5. Indian Pomegranate has better competitiveness in International market is accepted

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