

## GROWTH AND STABILITY IN CASTOR OIL EXPORT FROM INDIA

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### ABSTRACT

*The research study entitled "Growth and stability in castor oil export from India" was undertaken with the objective to analyze the growth and instability in export of castor oil from India. The secondary data for the 20 years was collected and different analytical tools like compound annual growth rate and instability index were used for the study purpose. The study revealed that export of castor oil from India was mainly focused on China, Netherland, France, USA, Japan, Thailand, Korea, UK, Italy, Turkey and Other country group. The growth rate for the quantity of castor oil exported was more than value obtain from export of castor oil. Quantity of castor oil exported was growing at 7.44 per cent per annum. All countries showed more than 8 per cent instability in castor oil export during study period. Italy remains the most unstable market and UK remains more stable markets in terms of export quantity and Korea remains more stable markets in terms of export value of Indian castor oil throughout the study period. Korea, UK and Turkey were the most preferable market for the export of castor oil.*

**Keywords:** Growth, Instability, Matrix of Association, Export, Secondary Data.

### Introduction

India is the world's largest producer and exporter of castor seed oil and exports around 80 per cent of its total castor oil production. India has a limited domestic consumption with less than 10 per cent production going for a value addition that too is limited to base levels. The main consuming segments are paints (45%), soaps (30%), and lubricants (20%). (Anon., 2020). Though, India is a dominant player in the world market, it is just a price taker and not a price setter due to its poor infrastructure. However, it has the capability to improve on the exports of the derivatives of castor and overcome this limitation (GowriShanker, 2013). Therefore a study on growth and stability of castor oil export from India will give the indication about the expansion or contraction in castor oil export and degree of risk involved in this business.

### Objective

To examine growth and instability in castor oil export from India

### Methodology

Secondary data related to the exports of castor oil over a period of time was collected from websites (www.apeda.gov.in, www.dgft.gov.in, www.commodities.com) etc. Twenty year's (2001 to 2020) castor oil export data of India was used to find out the factors influencing the export of castor oil. Ten year's (2011-12 to 2019-20) castor oil export data (country wise) of India was used to find out the predict the export of castor oil. According to requirement of the specific objectives of the study and based on

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nature and extent of availability of data, compound growth rate analysis, instability index, matrix of association between growth and instability, revealed comparative advantage, Markov chain analysis, Garrett's ranking technique and transitional probably matrix, were used.

### Compound Growth Rate

Growth of any economic variable signifies its past performance. The analysis of growth is usually used in economic studies to find out the trend of a particular variable over a period of time. It clearly indicates the performance of the variable under consideration and hence it can be very well used for making interpretations and to evolve policy decisions. (Devi and Jadav, 2018). The growth in the export of castor oil was estimated using the exponential growth function of the form:

$$Y = a b^t$$

Where,

Y = Dependent variable i.e. Quantity, Value and Unit value

a = Intercept

b = Regression coefficient

t = Time variable

The compound growth rate was computed by using the relationship

$$CGR = \{(b) - 1\} \times 100$$

The significance of the regression coefficient was tested using the students,  $t^*$  test.

### Instability Index

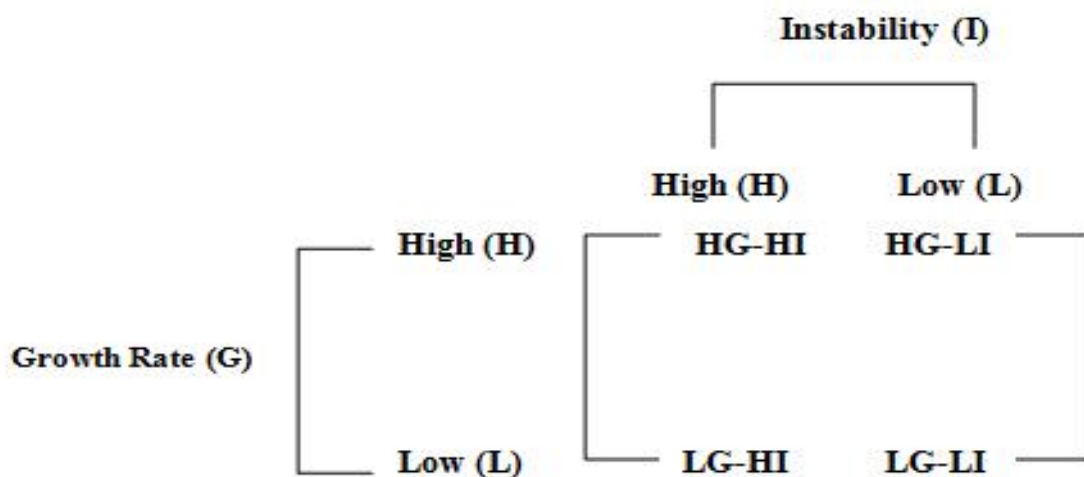
Instability index is a simple analytical technique to find out the fluctuation or instability in any time series data. The formula suggested by Cuddy-Della Valle was used to measure instability, which is used as measure of instability in time series data. This method corrects the coefficient of variation, if data are scattered around the negative or positive trend line. The Cuddy-Della Valle Index is given as follows (Siddeshwar *et al.* 2018):

$$I = CV \cdot (1 - R^2)^{0.5}$$

Where, CV is coefficient of variation defined as the ratio of sample standard deviation to its mean and  $R^2$  is the corrected coefficient of determination of the log linear trend function that fits the time series. If the F-test is significant at 5 per cent level of significance, then the index is calculated by using  $R^2$ . When test statistics is not significant or  $R^2 < 0$ , then CV is chosen to measure instability index.

### Matrix of Association between Growth and Instability

Based on analysis of growth rates and instability index the markets under consideration was classified into four categories (Rabadiya, 2019).



- **High Growth / High Instability (HG-HI):** The market whose growth rate and instability are greater than the average;
- **High Growth / Low Instability (HG-LI):** The market whose growth rate is higher than the average but the instability is lower;
- **Low Growth / High Instability (LG-HI):** The market whose growth rate is below average and instability is above average; and
- **Low Growth / Low Instability (LG-LI):** The market whose growth rate and instability are below average.

### Results and Discussion

In this section an attempt has been made to analyze the compound growth rate (CGR), instability and matrix of association between growth and instability in export quantity and export value of castor oil. The data pertaining to it was accessed from the secondary source for a period of 20 years (2000-01 to 2019-20) for castor oil by using an exponential growth model. The annual compound growth rate in export quantity and export value of castor oil with standard error are presented in table 1, the results revealed that during the study period, the export of castor oil was mainly focused on China, Netherland, France, USA, Japan, Thailand, Korea, UK, Italy, and Turkey. The compound growth rates of export in terms of quantity and value were found positive and highly significant. Quantity of castor oil exported was growing at 7.44 per cent per annum whereas value gained by castor oil export was growing at 12.04 per cent per annum. It indicates that export of castor oil generates better returns. Among all the countries, the highest growth rate (21.81%) in export quantity was noticed for China, followed by Turkey(12.62%), Italy (9.88%), Korea (8.78%), UK (8.77%), Netherland (5.73%), Thailand (5.60%), USA (4.66%), France(4.55%), and other countries group (2.99%) but negative growth rate was noticed for Japan (-0.77%). The highest growth rate (26.83%) in export value was also recorded for China, followed by Turkey (15.29%), Italy (14.40%), Korea (13.31%), UK (13.00%), Netherland (10.57%), Thailand (9.80%), USA (9.54%), other countries group (7.70%), France (7.43%) and Japan (3.54%).

China, Turkey, Italy, Korea, UK, Netherland and other countries group registered positive and significant growth rate in terms of export quantity and China, Turkey, Italy, Korea, UK, Netherland, Thailand, USA and other countries group registered positive and significant growth rate in terms of export value. While USA and France registered positive but non-significant growth rate in terms of export quantity. Growth rates for export quantity registered positive and significant which increase in export of castor oil from India and growth rate for export value registered positive but non-significant which decrease in export value of castor oil from India. The export quantity was highly significant than export value of castor oil from India. This may be due to increase in quantity and decline export value.

**Table 1: Market wise Growth analysis of Castor Oil Export from India**

Export Market	Export Quantity	Export value
	CGR (%)	CGR (%)
China	21.81*	26.84*
Netherland	5.73*	10.57*
France	4.56*	7.43**
USA	4.66	9.54
Japan	-0.77*	3.54*
Thailand	5.60	9.80
Korea	8.78**	13.31**
U K	8.77**	13.00**
Italy	9.88	14.00**
Turkey	12.62*	15.29*
Other country	2.99	7.70**
Total	7.44**	12.04*

CGR = Compound growth rate, CV = Coefficient of variation, \*\* Significant at 1 per cent level, \* Significant at 5 per cent probability level

The Cuddy-Della Valle Index (CDV) with coefficient of variation of castor oil export in terms of quantity and value are depicted in table 2. The results revealed that among all the countries, the highest instability for both in terms of quantity (42.07 %) and value (38.90 %) was found in Italy. The lowest instability in terms of quantity (7.72 %) was found in UK and value (9.40 %) was found in Korea. In China instability was in quantity (16.31 %) and in value (21.70 %), but the co-efficient of variance in terms of export quantity (73.56 %) and value (80.42 %) was highest in China. Similarly, the co-efficient of variation

of castor oil export in quantity (17.19 %) and value term (29.14 %) were found lowest in Japan. All countries showed instability in castor oil export during study period. Italy remains most unstable market throughout the study period followed by France, China, other countries group, Thailand and USA. Netherlands remains more stable markets in terms of export quantity and value of Indian castor oil throughout the study period.

**Table 2 Market wise instability analysis of castor oil export from India**

Export Market	Export Quantity		Export value	
	CV (%)	CDV (%)	CV (%)	CDV (%)
China	73.56	16.31	80.42	21.70
Netherland	33.38	9.70	53.70	13.64
France	38.91	17.99	50.36	19.79
USA	32.01	10.32	52.20	13.29
Japan	17.19	9.32	29.14	10.72
Thailand	41.57	13.64	59.00	18.90
Korea	44.13	8.95	58.43	9.40
U K	42.28	7.72	57.30	11.70
Italy	81.94	42.07	88.70	38.90
Turkey	60.41	9.86	66.16	12.67
Other country	35.04	14.79	50.34	14.73
<b>Total</b>	<b>41.35</b>	<b>8.43</b>	<b>58.70</b>	<b>12.86</b>

CV=Coefficient of variance; CDV=Cuddy-Della Valle

#### Matrix of Association between Growth and Instability

Based on analysis of growth rate and instability index the market under consideration was classified in four categories. The average value of growth rate and instability index of castor oil export is presented in table 3. The average growth value in terms of export quantity and export value are 7.70 and 11.95 per cent respectively, if the growth rate is greater than the average value it shows high growth and less than the average value it shows low growth. The average instability index value in terms of export quantity and export value are 14.61 and 16.86 per cent respectively, if the instability is greater than the average value it shows high instability and less than the average value it shows low instability.

**Table 3: Growth and instability Analysis of Castor Oil Export from India**

Country	CGR (%)		Instability (%)	
	Export Quantity	Export value	Export Quantity	Export value
China	21.81	26.84	16.31	21.70
Netherland	5.73	10.57	9.70	13.64
France	4.56	7.43	17.99	19.79
USA	4.66	9.54	10.32	13.29
Japan	-0.77	3.54	9.32	10.72
Thailand	5.60	9.80	13.64	18.90
Korea	8.78	13.31	8.95	9.40
UK	8.77	13.00	7.72	11.70
Italy	9.88	14.00	42.07	38.90
Turkey	12.62	15.29	9.86	12.67
Other country	2.99	7.70	14.79	14.73
<b>Average</b>	<b>7.70</b>	<b>11.95</b>	<b>14.61</b>	<b>16.86</b>

- **High growth and low instability (Highly Preferable):** Korea, UK and Turkey were recorded in this category in castor oil in terms of quantity and value of export. These three countries were found under most desirable category. Korea, UK and Turkey were the loyal toward the Indian castor oil export; their efforts should be more concentrated towards the falling under highly preferable category which has high growth and low instability.
- **High growth and high instability (This category is preferable based on the greatness of growth over instability index):** China and Italy in terms of quantity and value of export placed in this category. In this category, both growth rate and instability were high. This necessitates primary concern to export stabilization because higher growth in export along with high instability will not be much useful to farmers. So, to reduce risk, trade diversification is required in China and Italy because of ever fluctuating demand of castor oil due to domestic production.

- **Low growth and low instability (Less Preferable):** Netherland, USA, Thailand and other countries group in terms of export quantity and value were reported under this classification. This country was the less desirable for Indian castor oil export.
- **Low growth rate and high instability (Not Preferable):** France and Japan in terms of both quantity and value of export fall under this category. So, strategies to increase growth rate and reduce instability are required to overcome this unusual situation.

#### Matrix of association between growth and instability in export of castor oil from India

Risk Assessment	High Instability	Low Instability
High Growth	China, Italy	Korea, UK, Turkey
Low Growth	France, Japan	Netherland, USA, Thailand, Other country

#### Conclusion

Export of castor oil from India was mainly focused on China, Netherland, France, USA, Japan, Thailand, Korea, UK, Italy, Turkey and Other country group. The growth rate for the quantity of castor oil exported was more than value obtain from export of castor oil. Quantity of castor oil exported was growing at 7.44 per cent per annum. All countries showed more than 8 per cent instability in castor oil export during study period. Italy remains the most unstable market and UK remains more stable markets in terms of export quantity and Korea remains more stable markets in terms of export value of Indian castor oil throughout the study period. Korea, UK and Turkey were the most preferable market for the export of castor oil.

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