RESEARCH PAPER

Trends in export performance of wheat from India

UDHAYAN N[1] AND NAIK A D[2]

[1&2]Department of Agribusiness Management
College of Agriculture, University of Agricultural Sciences, Dharwad - 580 005, India
E-mail: udhay.iabm@gmail.com

Abstract: Wheat is globally the leading source of carbohydrate in human food, with the content of about 71 per cent, apart from this, it also contains 13 per cent proteins which is very high as considered to cereals and hence is also a major source of proteins around the world. Globally, India is the second-largest producer of rice, wheat and other cereals. The huge demand for cereals in the global market is creating an excellent environment for the export of Indian cereal products. The present study aimed to analyze the growth and instability index of wheat export from India. The study depends on secondary data which was collected from APEDA website for the year 2011-12 to 2022-23. The compound annual growth rate analysis and Cuddy Della Valle Instability Index was employed for analysis of growth rate and instability index of wheat exported from India. The results revealed that the growth rate of quantity and value of export of wheat from India showed negative growth of -0.87 per cent and positive growth of 3.44 per cent, respectively. The instability indices for export of wheat from India were found positive in both quantity (98.67) and value (99.86) terms and in the range of above 30 which inferred high instability.

Key words: Compound annual growth rate, Instability index, Trends, Wheat export

Introduction

Cereals are a rich source of vitamins, minerals, carbohydrates, fats, oils and protein. When refined by the removal of the bran and germ, the remaining endosperm is mostly carbohydrate. In some developing nations, grain in the form of rice, wheat, millet or maize constitutes a majority of daily sustenance. Wheat is a cereal grain that belongs to the grass family of the genus '*Triticum*'. The origin of the durum wheat was probably in the region of Abyssinia, whereas the whole group of soft wheat, which includes the bread wheats, probably originated in the region of Pakistan, South Western and the Southern parts of mountainous Bokhara. It is cultivated mainly in the temperate and sub temperate regions of the world. Although a number of species of wheat are recognized in the world, only three species of wheat namely; *Triticum aestivum* (Bread wheat), *T. durum* (Macaroni wheat) and *T. dicoccum* (Emmer wheat) are commercially cultivated in India. Wheat is globally the leading source of carbohydrate in human food, with the content of about 71 per cent, apart from this, it also contains 13 per cent proteins which is very high as considered to cereals and hence is also a major source of proteins around the world.

The health benefits of wheat greatly depend upon the form in which it is consumed. While whole wheat is extremely nutritious, the benefits of wheat are reduced if it is eaten as white flour which is obtained by processing after only 90% extraction from the grain in Indian condition. Various studies and researches showed that wheat and wheat flour play an increasingly important role in the management of India's food economy. Being the second largest in population, it is also the second largest in wheat consumption after China, with a huge and growing wheat demand. Uttar Pradesh is the largest producer of wheat contributing for about 32 per cent. Madhya Pradesh accounting for about 18 per cent followed by Punjab for about 16 per cent, Haryana for about 11 per cent and Rajasthan for about 10 per cent of the total wheat output in the country.

Globally, India is the second-largest producer of rice, wheat and other cereals. Huge demand for cereals in the global market is creating an excellent environment for the export of Indian cereal products. In 2008, India imposed a ban on the export of rice and wheat, *etc*., to meet domestic needs. At present, considering the huge demand in the global market and the country's surplus production, India has lifted the ban, but only a limited amount of export of the commodity is allowed. The allowed marginal quantity of exported cereals could not make any significant impact either on domestic prices or the storage conditions. The important cereals are - wheat, paddy, sorghum, barley and maize.

According to the third advance estimates 2022-23 by the Ministry of Agriculture of India, the production of major cereals like rice, maize and sorghum stood at 135.54 million tonnes, 35.91 million tonnes and 4.00 million tonnes respectively. The latest data of wheat production is available for the periods of 2022-23 and it is estimated to be 112.74 million tonnes (Third advance estimates). India is the largest producer as well as the largest exporter of cereal products in the world.

India's export of cereals stood at ₹ 96,011.42 Crore / 12,872.64 USD Millions during the year 2021-22 rice (including Basmati and Non- Basmati) occupy the major share in India's total cereals export with 75 per cent (in value terms) during the same period. Whereas, other cereals including wheat represent only a 25 per cent share of total cereals exported from India during this period. With this backdrop, in the present paper an attempt has been

made to analyze the trends in export performance of wheat from India.

Material and methods

The research is based on secondary data obtained from the APEDA database. Due to a significant fall in production during 2002-03, Government restricted wheat exports from the central pool of India from 2003. Exports from the private traders were also totally banned by 2007. The export ban was lifted only after four years in 2011. Unrestricted wheat exports were allowed by the beginning of 2011-12. So, the data gathered pertained to export quantity and export value of wheat for twelve years that is, from 2011-12 to 2022-23. The export of wheat from India is studied using the compound annual growth rate, co-efficient of variation and instability index.

Compound annual growth rate analysis

For computing compound annual growth rates of wheat export from India, the exponential function of the following form was used.

$$Y_t = a\, b^t U_t \text{——————————————} (1)$$

Where,

Y = Dependent variable (Export quantity or value) in the year 't'

a = Intercept termindicating Y in the base period (t=0)

b = Regression coefficient

t = Time period

U^t = error term

The equation (1) was transformed into log linear form and written as;

$$Log\ Y = log\ a + t\ log\ b + Ut \text{———————————} (2)$$

Equation (2) was estimated by using Ordinary Least Squares (OLS) technique.

Compound growth rate (g) was then computed

$$g = (b-1) \times 100 \text{————————————————} (3)$$

Table 1. Growth and instability index of wheat export from India

Year	Quantity (MT)	Value (₹ in Lakhs)
2011-12	749625	102319
2012-13	6514815	1052900
2013-14	5572025	927765
2014-15	2914743	497461
2015-16	614096	97232
2016-17	262462	44429
2017-18	229989	43174
2018-19	183161	36917
2019-20	217010	43839
2020-21	2086369	403380
2021-22	7234673	1582904
2022-23	4693292	1182690
MEAN	2606021.67	501250.83
CAGR (%)	- 0.87[NS]	3.44[NS]
CDVI	98.67	99.86

Note: NS-Non-significant

Where,

g = Compound growth rate in per cent per annum

b = Antilog of log b

The standard error of the growth rate was estimated and tested for its significance with 't' test statistic.

Instability analysis

In order to study stability of wheat crop with respect to area, production and productivity instability techniques were employed.

Co-efficient of Variation (C.V.)

The co-efficient of variation was estimated using the expression given below.

$$C.V. = \frac{Standard\ Deviation}{Mean}\ x\ 100$$

Cuddy Della Valle Instability Index

The instability in export performance of wheat crop from India were measured by using Cuddy-Della Valle Index. This method is being used by number of researchers as a measure of variability in time series data. CDI corrects the deficiencies of CV method. The divisions were classified as low (< 15%), medium (15 to 20%) and high instability (> 20%) based on CDI values. CDI is expressed as follows

$$CDVI = \sqrt{CV\ 1 - Adj\ R^2}$$

Where,

CV = Coefficient of variation (in percent)

$AdjR^2$ = Coefficient of determination from a time trend regression adjusted by the numberof degrees of freedom

Results and discussion

Growth and instability index of wheat export from India

Over the last few decades, the government's policy on food security and agriculture has increased wheat production in the country. As a result, the existing wheat surplus has given India a position to export the excess wheat into the global wheat market. As furnished in the Table 1, Fig. 1 and Fig. 2, it was observed that the growth and instability index of export of wheat from India. The export data taken for the period of twelve years from 2011-12 to 2022-23. The results revealed that over a period of twelve years the quantity of wheat export experienced marginally a negative growth rate *i.e.*, Compound Annual
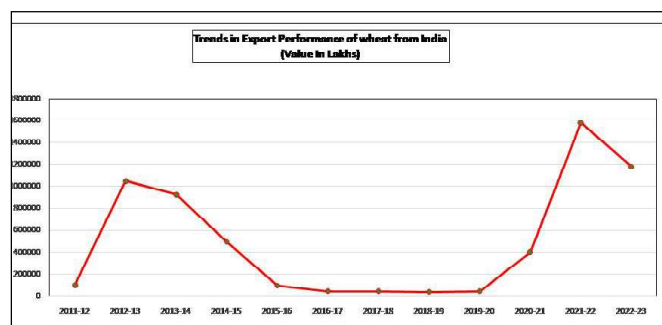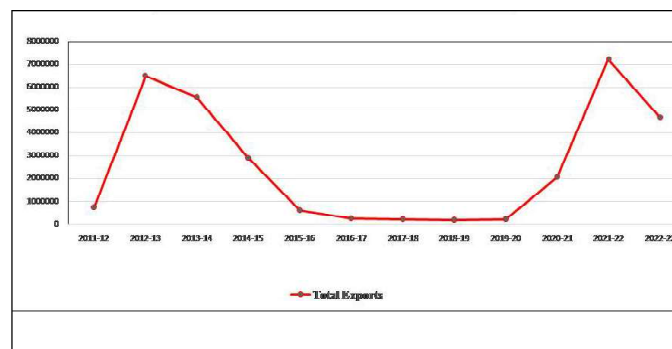
Growth Rate (CAGR) of -0.87 per cent which was found non-significant. In contrast, the value in terms of rupees in lakhs was positive *i.e.*, Compound Annual Growth Rate (CAGR) of 3.44 per cent which was also non-significant. Because, India's wheat exports depend mainly on the domestic demand-supply scenario and relative domestic prices to international prices. A country has an export advantage when the international prices are high relative to domestic prices. However, stiff competition in the international market and higher domestic prices resulted in a steady decline of wheat exports after 2015-16 as shown in Fig. 1 and 2.

The Cuddy-Della Valle Index (CDVI) also analyzed to know the instability index which is also presented in the Table 1. The result revealed that the CDVI of the quantity and value of wheat exportsto be 98.67 and 99.86 respectively, which showed high instability in quantity and value over the period of twelve years which indicated high risk in export of wheat from India.

Conclusion

This study has analyzed the trend in export of wheat from India and the instability by Cuddy Della Valle Index. The growth rate of quantity and value of export of wheat from India showed negative (- 0.87%) as well as positive (3.44%) growth trend. As domestic wheat prices were relativelyhigh compared to internationalwheat prices in global market during the study period, instability indices for export of wheat from India was positive in both quantity and value terms *i.e.* in the range of above 30, which indicated high risk in export of wheat from India in future.

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