EXPORT PERFORMANCE OF INDIAN WHEAT DURING POST REFORMS PERIOD

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ABSTRACT

Wheat is an important food crop in India in terms of area, production and consumer preference and is an important source of global food security. Emerging world demand for wheat offers a great opportunity for a producer like India to grab the world wheat market. The objective of the study is to find the impact of economic reforms on export performance of wheat in India. Present study explores the growth performance of wheat export of India for the time period 1991 to 2016 by using trend analysis, compound annual growth rate, percentage share in total agricultural exports/imports, percentage share in total merchandise exports/imports and Balassa's Index of comparative advantage.

KEYWORDS:

Wheat, Export performance, Comparative advantage, Merchandise, Compound growth rate.

INTRODUCTION

Economic reforms and trade liberalization policies have been widely adopted by developing countries to improve their position in world trade. More than two decades ago India also adopted economic reforms in 1991 to overcome its debt crisis, food shortage and budget deficit type of problems. In this liberalized world more focus is given on export performance and export competitiveness of agricultural commodities. Economic reforms started in 1991 gave a major boost to Indian agricultural exports. With the emergence of WTO in 1994, it was expected that India would be benefited due to comparative advantage in the production of many agricultural commodities including wheat. A number of studies have investigated the effects of trade liberalization on export performance of agricultural commodities in India. Many studies have identified positive effects of trade liberalization on export performance of these commodities. But there are very few studies that covered the effects of such reforms on export performance of wheat in India and for recent time-series data. The main focus of the study is to find the affects of economic reforms on the export performance on particular agricultural commodity wheat for the time period 1991-2016.

REVIEW OF LITERATURE

Wheat is one of the world's major food staples and one of the most traded foodgrain due to its inherent storability. World wheat consumption is increasing by time due to rise in world population. International trade will have a crucial role in fulfilling this increase in demand Nagarajan, (2004). The export of wheat from India largely depends on the domestic consumption of the cereal. It can be exported to other countries only if the production exceeds the consumption. But the main problem for Indian wheat export is price. The price of a tonne of wheat in India is \$10-\$20 more than the international price, which make it less competitive in the world market (Wheat Business in India, 2014), Export performance of different agricultural commodities has been found by many authors using different methodology. Thomas (2011), Suresh & Mathur (2016) analyzed the growth performance of agricultural exports in India by using trend growth, percentage share, compound annual growth rate (CAGR) and revealed comparative advantage (RCA) index. The author found that there was an improvement in the growth rate of export of agricultural commodities. The comparative advantage improved for some plantation crops but declined for rice and wheat. Ansari & Khan, (2015) also employed compound annual growth rate and Balassa's revealed comparative advantage index to find export performance of agricultural commodities. The results revealed that India has comparative advantage in export of some agricultural commodities such as meat and edible meat, oilseed, coffee, wheat, rice and tea. The impact of trade liberalization on export performance of agriculture in Pakistan had been also examined by using export diversification, export competitiveness and openness of agricultural trade. Empirical studies shows that export performance can be evaluated by analyzing relative export growth, the change in market share of agricultural exports and the change in commodity composition (Malik, 2010). India found to be competitive in export of meat products except poultry and milk products. Kumar (2010) analyzed the growth

performance of livestock exports with the help of percentage share of livestock exports/imports in total/agricultural and livestock GDP. The author suggested that strengthening of export supply capacity domestically hold the key for enhancing export of livestock and other agricultural products rather than expanding world market.

SPECIFIC OBJECTIVES OF THE STUDY

1. To examine the export performance of wheat in India
2. To analyze the comparative advantage of wheat in India

METHODOLOGY

To analyze the export performance and comparative advantage of wheat three parameters of export performance have been considered in the present study. These parameters are defined as under:

➢ Growth rate of wheat export- CAGR
➢ Share of wheat exports/ imports in Merchandise & Agricultural exports/ imports- Percentage Method
➢ Comparative advantage- RCA index

I.Model Estimation / Technique

The study used following estimation techniques to find the export performance and comparative advantage of wheat

• Compound Annual Growth Rate

To analyze the export performance during 1991-2016, Annual Compound Growth Rate (ACGR) has been calculated. The following formula has been used for the calculation Annual Compound Growth rate:

Y= A $(1+r)^t$ …………………………………………(i)

Log Y= Log A+ t log (1+r)……………………….. (ii)

Or Y*= a + bt

The ACGR (r) thus obtained as

1+r = Antilog b

r=Antilog b-1…………………………………………(iii)

In percentage term r = (Antilog b-1) X100

Here, r = Annual Compound Growth Rate

Y= Dependent Variable (i.e.; Production, Domestic Consumption, Exports, Imports)

t = time period

•Percentage Share Method

To analyze the export performance of wheat during 1991-2016, Percentage share of Wheat exports in Merchandise Exports/ Agricultural Exports & Percentage Share of Wheat imports in Merchandise Imports/ agricultural Imports have been calculated.

•Balassa's Revealed Comparative Advantage (RCA) Index:

The study employed time series data in which export performance and comparative advantage was analyzed by using Balassa's Reveled Comparative Advantage Index which was earlier used by Athanasoglou et al. (2010), Mukherjee (2012), Erkan & Saricoban (2014) and Suresh & Mathur (2016).

The study therefore used the following formula given by Balassa to compute RCA Index of wheat.

$$RCA = \frac{Xij/Xj}{Xiw/Xw}$$

Where,
Xij = India's export of ith commodity
Xj = Total merchandise exports of India
Xiw = World's export of ith commodity
Xw = World's merchandise exports
On the basis of results four fields of RCA values can be defined:

0 <RCA d 1 - No Comparative Advantage
1 <RCA d 2 - Weak Comparative Advantage
2 < RCA d 4 - Moderate Comparative Advantage
& if RCA > 4 - Strong Comparative Advantage

II. Data Base & Variables

The study has been conducted on Export performance of India for the time period of 1991-2016. The data has been collected from various sources. Annual Data on production, domestic consumption, exports & imports in 000'MT were collected from the United State Department of Agriculture (USDA) website. For further analysis data on export and import of wheat, agricultural export and import, merchandise exports and import, world export of wheat, agricultural commodities and merchandise goods were compiled from Food and Agricultural organization (FAO), APEDA, WITS, DGCIS Kolkata, website India.

Variable Specification

Variables	Purpose
Production, Domestic Consumption, Exports, Imports (000,MT)	Compound Annual Growth Rate
Wheat Exports/ Imports (India/World), Merchandise Exports/ Imports (India/ World), Agricultural Exports/ Imports (India/World) (US$ Million)	Percentage Share, Revealed Comparative Advantage

RESULTS AND DISCUSSION

The furnished results related to export performance and comparative advantage of wheat during post reforms period have been analyzed and presented through following heads:

•Trends & Growth Rate- CAGR

Wheat is an important crop in terms of both production and consumption. India is the second largest producer and consumer of wheat in the world. Although, India is self sufficient in wheat, it also imports wheat occasionally. Indian wheat has also been demanded by other countries of the world. Despite the second largest wheat producer India exported wheat occasionally. Data in table1 depicts the trends in production, consumption, export and import of wheat in India during 1991-2016. Data reveals that there has been slow rate growth in wheat production and consumption. For the time span of 26 years wheat production and consumption get double which is a low increase for these years. Slow pace rise in wheat production posed a challenge to the food security system. The data also reveals the trends in exports and imports of wheat over the study period. Indian wheat trade was very inconsistent and variable over the study

period. Wheat was occasionally exported and imported by India. Overall the trend data in table 1 show wheat as an important crop in terms of production and consumption but poor crop in terms of wheat trade.

To compare the recent and past growth trends annual compound growth rate has been calculated for production, consumption, exports and imports for the time period 1991-2016. The time period has been divided into three equal phases namely, 1991-1999, 2000-2008, 2009-2016. The results of the calculations are presented in Table 2.

In the first phase 1991-1999, CGR was 3.3 for production and 2.8 for domestic consumption that was positive but low. But exports CGR found negative by 41.2 percent. For imports it was positive by 31.6 percent that was very high. During this period there was a rise in production but there was negative growth of wheat export. The reason behind negative export growth was a ban on wheat exports from 1997 to 1999. In the second phase 2000-08, there was a little rise in production and domestic consumption of wheat by CGR 0.5 & 1.1 respectively. One of the reason for above result was wheat crisis in 2006, for a decade yields remained stagnant, by that time domestic prices in India spiked to a record high. Here CGR for exports was negative by large percentage that is 47.9 percent. Although India opened the door for wheat exports in 2001 but again it started falls between 2003 and 2007. For this time, CGR of imports were 14.2 percent which was high. Hence India again becomes a net importer of wheat in the second phase. In the third phase 2009-2016, CGR for production and domestic consumption was 1.3 and 3.0 percent respectively that was again very low. CGR for exports was 45.1 percent that shows a positive growth in export of wheat for India. But this time imports CGR was also very high at 42.2 percent. A comparison of CGR values for all variables between three time period viz. 1991 to 1999, 2000 to 2008 and 2009 to 2017 shows that all variables depicts a fluctuating trend growth rate over the whole time period. CGR value for wheat production for the entire period under observation was 1.9 percent that was very low and showing stagnation in wheat production over the time. CGR for domestic consumption for the entire period was 2.0 percent that was also very low. Export growth was quite high with CGR value 12.3 percent. It shows that export performance of wheat over the 26 years time span remained fluctuating but positive. There was a negative CGR for wheat imports by 4.6 percent during the study period of 1991-2016. Overall, it shows the fluctuating growth rate of wheat trade during the time period of 1991-2016.

II.Share of Wheat Exports − Percentage Method

Table 3 presents the share of wheat in Merchandise and Agricultural Exports & Imports of India for the time period 1991-2016. During the post reform period export share of wheat in agricultural exports and merchandise exports remained very low from 1991 to 1999. A higher and rising trend of wheat share in Agricultural Exports has been observed between 2000 to 2005 with relatively low share in 2004 & 2005. It was due to excessive wheat storage by the end of 1999 which was further due to high procurement of wheat by FCI between 1998 & 1999.

A declining trend of share of wheat exports in total agricultural exports of India was observed for the time period 2006 to 2011. There was a wheat crisis in 2006 and exports of wheat were banned for the time period 2007 -2011 that

was the basic reason for lowest export share of wheat in total agricultural exports. Following the same pattern, it again shows a fluctuating trend and start rising during 2012-2015. The factor behind this rising share of wheat exports in total agricultural exports was free trade policy of 2011-12. The same pattern has been also observed in the share of wheat exports in total merchandise exports. A glance of table reveals that this share was very low throughout the study period. It shows the poor performance of wheat exports in total merchandise exports. Before the emergence of WTO, this share is in a fluctuating manner between1991 to 1995. From 1996 to 1999 it shows a significant value with low fluctuations. One thing which is truly revealed by the data is that import share of wheat in total agricultural imports is low in those years for which exports share is high. Only 2008 and 2011 are the two years in which imports share and exports share both are very low. The wheat crisis of 1989-90 and 1990-91 put pressure on the Government to increase wheat imports in 1991-92. Wheat crisis has again observed in 2005-06 due to low procurement of wheat by FCI, low rise in MSP and shifting of cropping pattern to other crops in major wheat producing states viz. Punjab & Haryana. It puts pressure on the country to import wheat in 2007. In 1996-97, successive low yield years cause a shortage in wheat stocks and domestic prices started to rise and India became a net importer of wheat between 1997 & 1999 (Shenoy,2008). In 2006 and 2007 import share in total agricultural imports was high at 18.27 percent and 11.88 percent respectively. But again the share started decline from 2008 till 2014. The share of wheat imports in total agricultural imports was 17.16 percent in 2016. Since October 2015 imports were high due to hike in domestic prices coupled with relatively weak international prices (Commodity Profile of Wheat, 2017). The overall results show that share of wheat imports in total merchandise imports was also very low during the study period.

III. Comparative Advantage − RCA Index

Table 3 shows that whether India's wheat share in merchandise exports & agricultural exports was very low but it does not mean that India has no comparative advantage in wheat exports. To analyze the export performance of wheat in more detail the revealed comparative advantage has been computed using Agricultural Trade Measure (ACA). Revealed comparative advantage has also been computed using Total Merchandise Trade Measure (TCA) because wheat is also a commodity included in total merchandise exports. To find the comparative advantage of India's wheat exports Balassa's revealed comparative advantage index has been computed on the basis of both ACA measure and TCA measure. The Table 4 shows the RCA index value on the basis of ACA measure and TCA measure. RCA Index has been computed for the time period 1991-2016. RCA values here are classified on the basis of given methodology. These values are defined as strong for RCA>4, Moderate for 2<RCA<4 Weak for 1<RCA< 2 & No for 0<RCA<1, that shows that product has no comparative advantage. The index value varies from 0 to 2.60 on ACA basis and varies between 0 to 3.80 on TCA basis. On the basis of merchandise exports weak revealed comparative advantage has been observed in 1995 and 1996 whereas there was no comparative advantage on the basis of agricultural exports. During the period 2001-2004, RCA index is quite a good figure which increases from 2.80 to 3.84 and 1.90 in 2004 due to government policies. In July 2001, government lifted all the restrictions on the wheat exports. Under the

open wheat market environment RCA index for this time period shows that India has comparative advantage in the wheat exports. In 2003 the RCA value is highest at 3.84 on merchandise basis and 2.60 on agricultural exports basis. Revealed comparative advantage for wheat exports has been also observed for the time period 2012 to 2015. There was an export ban on wheat from February 2007 that continued until September 2011. Exports of wheat become free from wheat trade policy 2011-12 (Tripathi & Mishra, 2017). All these policy changes caused revealed comparative advantage for the time period 2012-2015. It shows that India has potential for wheat in the export market. Overall there is a need to maintain a sustainable and growing wheat sector so as to maintain the comparative advantage of wheat in India.

CONCLUSION

The present study has analyzed the trends in export of wheat from India during the post reform period and examines the export performance of wheat with the help of different analyzing techniques. The study finds that there was not any significant improvement in wheat exports due to economic reforms. Though there was a bit improvement in the wheat production in the country but export performance was showing very poor results. The percentage share of wheat exports in agricultural exports and merchandise exports was very low which shows a poor share of wheat exports in its total exports and was a symbol of poor export performance. CAGR calculation in the study shows a drastic ups and down in the export growth of wheat. There was a lack of trend and secular growth of wheat exports by India. The study reveals that India has comparative advantage in the export of wheat but it does not hold good for all years under the study. The wheat production, consumption, imports and exports of India were inconsistent and variable over the past year which has challenged the soundness of its food security system. Over the last two and half decades, export performance of wheat in India was dismal and inconsistent.

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Table: 1
Trends of Production, Domestic Consumption, Export and Imports during the Time period of 1991-2016

(In thousands MT)

Market Year	Production	Domestic Consumption	Export	Imports
1991	55134	58009	680.00	100.0
1992	55690	57515	50.000	2500.0
1993	57210	53377	28.000	500.00
1994	59840	58330	100.00	30.000
1995	65470	64978	1500.0	50.000
1996	62097	66064	2000.0	1445.0
1997	69350	69246	0.0000	1731.0
1998	66350	63707	0.0000	2203.0
1999	70780	68793	200.00	1372.0
2000	76369	66821	1569.0	441.00
2001	69680	65125	3087.0	32.000
2002	72770	75254	4850.0	34.000
2003	65760	68918	5650.0	8.0000
2004	72150	72838	2120.0	8.0000
2005	68640	69980	801.00	41.000
2006	69350	73477	94.000	6721.0
2007	75810	76423	49.000	1962.0
2008	78570	70924	23.000	7.0000
2009	80680	78150	58.000	218.00
2010	80800	81760	72.000	272.00
2011	86870	81404	891.00	15.000
2012	94880	83822	6824.0	16.000
2013	93510	93852	6053.0	25.000
2014	93850	93725	3500.0	45.000
2015	86530	88551	1130.0	471.00
2016	87000	97500	400.00	5896.0
2017	96000	99000	500.00	4000.0

Source: United State Department of Agriculture, (www.usda.gov)

Table: 2
Growth Performance of Wheat Production, Domestic Consumption, Exports and Imports of India during the Time Period of 1991-2016

Variables	B. Value	C.G.R. (Percentage)
Time Period 1991-1999		
Production	1.033 (237.61)*	3.3
Domestic consumption	1.028 (139.06)*	2.8
Exports	0.588 (1.70)**	-41.2
Imports	1.316 (4.61)*	31.6
Time Period 2000-2008		
Production	1.005 (129.05)*	0.5
Domestic consumption	1.011 (167.16)*	1.1
Exports	0.521 (6.69)*	-47.9
Imports	1.142 (2.89)*	14.2
Time Period 2009-2016		
Production	1.013 (107.41)*	1.3
Domestic consumption	1.030 (166.95)*	3.0
Exports	1.451 (3.70)*	45.1
Imports	1.422 (3.20)*	42.2
Time Period 1991-2016		
Production	1.020 (645.50)*	2.0
Domestic consumption	1.020 (725.67)*	2.0
Exports	1.123 (11.31)*	12.3
Imports	0.954 (17.22)*	-4.6

Author's calculation based on USDA data. * Significant at 1 per cent, ** significant at 5 per cent.

Table: 3

Share of Wheat Exports and Imports in Agricultural Exports / Imports and Merchandise Exports/Imports

Years	Wheat Exports (Million USS)	Wheat Imports (Million USS)	Trade Balance	Share of Wheat Exports (In percentage)		Share of Wheat Imports (In Percentage)	
				Merchandise Exports	Agricultural Exports	Merchandise Exports	Agricultural Exports
1991	59.00	0.00	59.000	0.33	2.11	0.000	0.000
1992	4.000	270	-266.00	0.02	0.14	1.120	19.94
1993	0.060	40.0	-40.000	0.00	0.00	0.170	3.830
1994	14.00	0.10	14.000	0.053	0.43	0.0003	0.000
1995	114.0	3.00	111.00	0.35	2.07	0.0070	0.130
1996	196.0	113	83.000	0.58	3.35	0.290	5.110
1997	0.000	267	-267.00	0.00	0.00	0.630	10.36
1998	0.330	280	-280.00	0.00	0.00	0.650	7.310
1999	0.001	180	-180.00	0.00	0.00	0.360	4.530
2000	92.00	0.64	92.000	0.20	1.86	0.001	0.020
2001	296.0	0.19	296.00	0.67	5.66	0.0003	0.004
2002	362.0	6.00	356.00	0.68	6.56	0.010	0.150
2003	514.0	5.00	509.00	0.82	7.90	0.006	0.100
2004	322.0	16.0	306.00	0.40	4.56	0.010	0.310
2005	126.0	6.00	120.00	0.12	1.40	0.004	0.110
2006	8.000	1291	-1282.0	0.006	0.07	0.710	18.27
2007	0.060	961.0	-961.00	0.00	0.00	0.440	11.88
2008	0.300	0.003	0.0000	0.00	0.00	0.000	0.000
2009	0.010	48.00	-48.000	0.00	0.00	0.020	0.370
2010	0.130	56.00	-56.000	0.00	0.00	0.020	0.530
2011	145.0	0.007	145.00	0.05	0.47	0.015	0.000
2012	1350	0.540	1350.0	0.45	3.53	0.0001	0.003
2013	1912	5.000	1907.0	0.61	4.50	0.001	0.030
2014	828.0	9.530	1556.47	0.49	7.30	0.002	0.200
2015	151.0	135.06	692.940	0.27	5.10	0.030	2.320
2016	67.00	1268.64	-1104.64	0.06	1.00	0.330	17.16

Source: Author's calculations based on FAO data.

Table: 4

Revealed Comparative Advantage Index (RCA) of Wheat during the Post Reform Period (1991-2016)

Year	RCA Index (Merchandise Exports)	Comparative Advantage (Merchandise Exports)	RCA (Agricultural Exports)	Comparative Advantage (Agricultural Exports)
1991	0.81	NO	0.49	NO
1992	0.04	NO	0.03	NO
1993	0	NO	0	NO
1994	0.16	NO	0.12	NO
1995	1.05	WEAK	0.55	NO
1996	1.57	WEAK	0.78	NO
1997	0	NO	0	NO
1998	0.003	NO	0	NO
1999	0	NO	0	NO
2000	0.92	NO	0.54	NO
2001	2.80	MODERATE	1.60	WEAK
2002	2.85	MODERATE	1.90	WEAK
2003	3.84	MODERATE	2.60	MODERATE
2004	1.90	WEAK	1.44	WEAK
2005	0.72	NO	0.52	NO
2006	0.037	NO	0.025	NO
2007	0	NO	0	NO
2008	0	NO	0	NO
2009	0	NO	0	NO
2010	0	NO	0	NO
2011	0.18	NO	0.13	NO
2012	1.71	WEAK	0.97	NO
2013	2.33	MODERATE	1.27	WEAK
2014	2.21	MODERATE	2.57	MODERATE
2015	1.18	WEAK	1.82	WEAK
2016	0.30	NO	0.57	NO

Source: Author's calculations based on FAO data