

# Wheat and Rice Competitiveness of Indian Agriculture

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## Abstract

*The objective of the present study is to analyze the wheat and rice competitiveness of Indian agriculture under WTO regime. It has been observed in the study that calculated values of NPC and EPC were in tandem with the actual export performance of wheat and rice. NPC and EPC's value higher than one indicated that domestic prices were higher than international market prices or world reference prices. It could have been because of government's protection policies and restriction on trading of a particular commodity. If the protection of the particular commodity is higher and effective, prices are most likely to get stabilize and remain above than average prices. Among different crop groups rice and wheat have enjoyed most favourable price environment because of strong government support in raising their support prices.*

**Keywords:** WTO, India, Agriculture, Competitiveness, Wheat, Rice

## I Introduction

India introduced radical policy reforms in various economic sectors, including trade. Economic reforms started in 1991 gave a major boost to agricultural exports. The main factor for this impressive export growth was that international prices of several agricultural commodities were well above the domestic prices and liberalization provided the opportunity to exploit this advantage. In 1991, Indian government devalued the rupee by 19 percent which also led to the competitiveness of agriculture sector. This led to the belief that Indian agriculture was highly competitive and

generated a favorable environment for free agriculture trade. This happened at a time, when the agreement on agriculture (AoA) under WTO came into effect from 1<sup>st</sup> January 1995, which marked the beginning of a new era of agricultural trade policy in India.

Bhalla (2003) measured the competitiveness of Indian agriculture sector in 1990s under import and export hypothesis. On the basis of import hypothesis, most of the crops except oilseeds, some coarse cereals, and sugar were competitive. In the case of these commodities also, the picture would change in case the developed countries agree to withdraw their domestic support to agriculture. Gulati and Kelley (1999) observed that in international trade, initiation of the Uruguay round of GATT, led to the inclusion of agriculture into world trading system. Since then, in every participating nation, many studies have been undertaken to study the impact of agricultural trade on liberalizations. These studies, on the basis of their findings, have paved the way for some useful changes in the domestic and foreign trade policies of these nations. In India too, slew of such studies have been undertaken and these studies have also suggested various strategies and changes in domestic policy to adjust the various provisions of "Agreement of Agriculture" incorporated into GATT. Base for most of these studies have been the export competitiveness on measures like nominal protection coefficient (NPC) and effective protection coefficient (EPC) to suggest whether the country has advantage in exporting and importing different agricultural commodities. As international price scenario

changed dramatically after 1996, it has seriously affected the trade and competitiveness of the agricultural commodities. In this study, an attempt is made to examine the most recent changes in export competitiveness of wheat and rice agricultural commodities in reference to domestic and global prices and market trends. Competitiveness is basically studied by choosing a fairly long period which covers full range of international prices from 1995 when international prices were at peak to the year 2014-15. This duration of the study has witnessed many peaks and downfalls in international prices and market trends. The focus of analysis will remain on major crops namely wheat, rice (basmati & non-basmati).

However, the import competitiveness is getting reduced overtime because of several factors. Bhalla (2003), Chand and Jha (2001), Vyas (2001) mentioned the following reasons for this trend. First, the price hike given to these commodities. Secondly, the productivity growth rates in these crops have decelerated during the recent years which are primarily due to inadequate investment and non-availability of new technology. Thirdly, competitiveness is also adversely affected due to huge export subsidy and domestic support being given by the developed nation which cause decline in international prices. As far as export competitiveness is concerned, some of the major crops like rice and wheat became non-competitive during some recent years because of fall of their international price combined with a big increase in their domestic price due to increase of MSP.

## II Objectives of the Study

The present paper is an attempt to examine the competitiveness of Indian agriculture under WTO regime. Thus, the objective of the study is to analyze the wheat and rice

competitiveness of Indian agriculture under WTO regime.

## III Methodology

Export competitiveness of wheat and rice have studied for a period of 20 years i.e. from 1995-96 to 2014-15. This study is based on the secondary data. The data has been collected from various sources i.e. DGCIS, FAO, Agriculture Statistics at a Glance etc. There are mainly two types of measures which have been widely used to reveal trade competitiveness.

**1. Nominal Protection Coefficient (NPC):** NPC is the simplest indicator of domestic protection and export competitiveness. The measure is given by:

$$NPC_i = P_{id} / P_{iw}$$

Where,

$NPC_i$  = Nominal Protection Coefficient of the Commodity i

$P_{id}$  = Domestic Price of Commodity i

$P_{iw}$  = World reference price (border price equivalent) of commodity i, adjusted for transportation, handling and marketing expenses.

NPC less than 1 indicates that the commodity is exportable and NPC greater than 1 indicates that the commodity is importable.

**2. Effective Protection Coefficient (EPC):** EPC is an improvement over NPC to the extent that it takes care of variation in domestic and international prices of tradable inputs. It is defined as the ratio of value added at domestic prices to the value added at border prices expressed in local currency and is given by:

$$EPC_i = V_i^d / V_i^w$$

Where,

$EPC_i$  = Efficient Protection Coefficient of the Commodity i,

$V_i^d$  = Value added at domestic Prices

$V_i^w$  = Value added at world reference prices (border price equivalents).

Like NPC, EPC greater than 1 indicates effective incentives to producers compared to free trade scenario and vice-versa.

In calculating EPC, fertilizers, seeds, insecticides, pesticides and fuel used in agricultural machinery have been treated as tradable inputs while land, labour and capital have been treated as primary non-tradable inputs. Cost of cultivation data as reported by economic and statistics advisor to government of India has been used as available for this study to estimate various indicators of competitiveness. While measuring NPC and EPC, care should be taken to use appropriate world reference prices.

#### **IV Wheat Competitiveness of Indian Agriculture**

NPC for wheat has been estimated under both exportable as well as importable scenarios. Haryana and Madhya Pradesh were selected to represent surplus regions of the country. International prices of US HRW No. 2 wheat has been used as world reference price. Accordingly ninety percent of US HRW wheat was considered as FOB price for wheat export. This price was further adjusted for domestic transportation and marketing cost between ports and producing region. Under importable hypothesis, international oceanic freight charges were added to US HRW wheat FOB price at US gulf Ports. It was assumed that wheat produced in surplus state would complete with imported wheat in coastal states. Thus, the imported wheat would have

advantage over the wheat production in Haryana and Madhya Pradesh to the extent of transportation charges between these states and coastal states. Accordingly, domestic transportation costs were deducted and port clearance charges were added to the imported reference prices. Like wheat, other commodities are also treated as exportable as well as importable commodity with one set world reference price.

Wheat being the most widely consumed commodity in Indian continent, especially northern part of the nation and neighboring Asian countries is being traded in large volumes. Along with rice, wheat trading leads the Indian agriculture trading. There have been the instances in the years 1997-98, 1998-99, 1999-2000, 2006-07 and 2007-08 where India had to import the wheat for meeting the domestic demand. In rest of the years from 1995-96 to 2014-15, India has either exported the wheat and was comfortably able to meet the domestic requirement. India's wheat exports have been considerably high in the recent years. To quote, India's wheat exports were 740776 MT in 2011-12, 6514810.60 MT in 2012-13 and 5562374.74 in 2013-14. Though there have been imports too of the wheat in these years but they have been much lesser when compared to total exports. For example, total imports of the wheat in the year 2012-13 were 2943.89 MT as against exports of 6514810.60 MT. The comparison of domestic and world reference price gives us the NPC and EPC for the analysis of export competitiveness of wheat. It can be seen from table 1:

**Table 1**  
**Domestic and International Price of Wheat**

(Rs/Quintal)

Year	Domestic Price	World Price	NPC	Value Added Domestic Price	Border Price	EPC
1995-96	404.56	670.65	0.68	440.97	745.97	0.59
1996-97	515.98	542.02	1.14	562.42	602.43	0.93
1997-98	562.84	481.32	1.47	613.50	534.65	1.15
1998-99	568.97	454.89	1.63	620.18	506.74	1.22
1999-00	676.82	492.09	1.81	737.73	547.76	1.35
2000-01	564.91	473.33	1.61	615.75	547.00	1.13
2001-02	666.59	846.57	1.32	726.59	524.87	1.38
2002-03	694.65	1280.98	0.54	757.17	1319.41	0.57
2003-04	639.70	876.98	0.73	697.27	903.29	0.77
2004-05	691.83	956.87	0.72	754.09	985.58	0.77
2005-06	700.55	1176.98	0.60	763.60	1212.29	0.63
2006-07	712.93	1009.56	0.71	777.09	1039.85	0.75
2007-08	772.84	1004.65	0.77	842.40	1034.79	0.81
2008-09	873.45	1368.98	0.64	952.06	1410.05	0.68
2009-10	912.45	1290.09	0.71	994.57	1328.79	0.75
2010-11	951.98	1284.87	0.74	1037.66	1323.42	0.78
2011-12	1001.52	1106.78	0.90	1091.66	1139.98	0.96
2012-13	1071.43	1254.45	0.85	1167.86	1292.08	0.90
2013-14	1204.75	1378.95	0.87	1313.18	1420.32	0.92
2014-15	1284.41	1369.40	0.94	1400.01	1410.48	0.99

**Source:** 1. Director General of Commercial Intelligence and Statistics, Kolkata, *Various Issues*.

2. [www.fao.org](http://www.fao.org).

3. Agriculture Statistics at a Glance, *Various Issues*.

It is cleared from table 1 that the NPC gives a vivid indication of the price differences. Years having NPC value less than 1 were the years when world reference prices were higher than domestic prices and producers should have exported more to gain from the trading. On the other hand, years having NPC value equal to or higher than 1 were the years when domestic prices were higher than world reference prices indicating that producers should have sold the stocks in domestic markets as selling in the international market

was not going to fetch them any premium or surplus value.

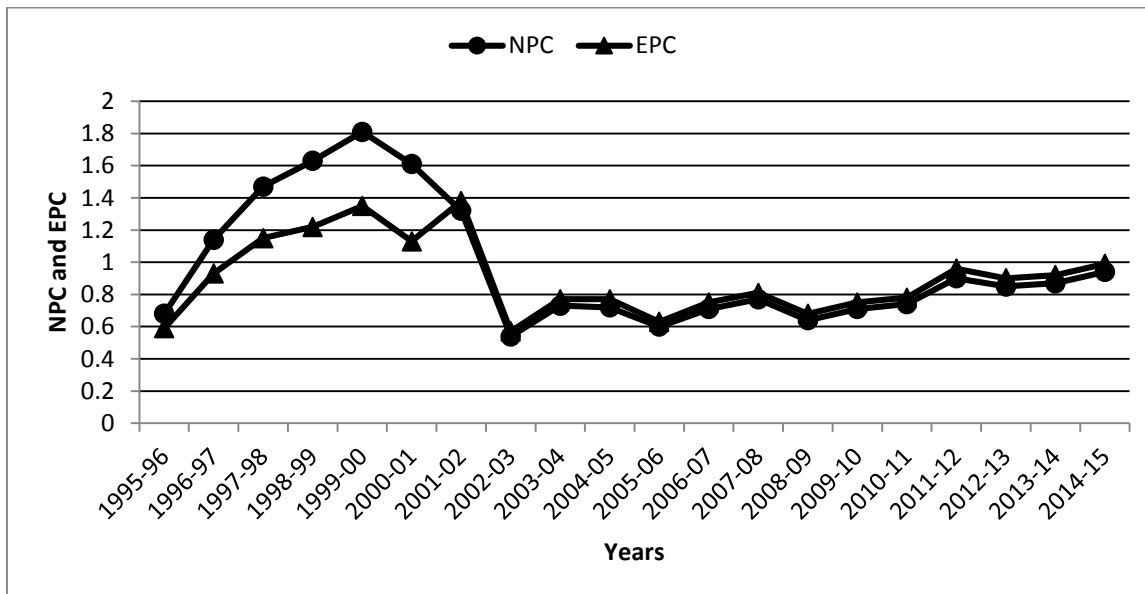
Starting from 1995-96, NPC value was 0.68 indicating that world reference prices, were higher than domestic prices. The world reference price of the wheat was Rs. 266 higher than the domestic price. But the coming three years from 1997-98 onwards had an unfavorable NPC. It was 1.47 in 1997-98, 1.63 in 1998-99, 1.81 in 1999-2000. International prices were lower than the domestic prices and thus the industries which are large consumers of wheat preferred to

import the wheat than buying from domestic markets. This resulted into imports exceeding the exports in these years. In 1997-98, total imports exceeded the exports by Rs. 988.58 crore by value, and in 1998-99, imports were Rs. 1163.42 crore higher than exports and in year 1999-2000, exports were short of imports by Rs. 773.35 crore.

For the next two years, NPC was not favorable, but afterward NPC has been less than 1 throughout the years till 2014-15. NPC

less than 1 indicated the export friendly prices in international trade and vice-versa. NPC value in 2002-03, 2005-06 and 2008-09 had been lower than 0.70 which indicates the significant margin in prices for exports. For example, world reference prices were Rs. 376 higher than domestic prices in 2005-06 and India could earn Rs. 557.53 crore because of this price difference in this particular year in trading of wheat. The following figure illustrates NPC and EPC:

**Figure 1**  
**NPC and EPC of Wheat**



Source: Table 1.

While observing the EPC, it was highest for the year 2002-03 at 1.38 as against NPC of 0.54. This happened because of government's check and restrictions on the trade as the year had seen a steep increases in the international prices and government had imposed restrictions on large volume of exports. A year before, international prices were much lower than domestic prices and NPC was at 1.32. Such sharp increase and decrease in the international as well as domestic prices brings in swings of exports and imports. EPC had

been most favorable for wheat trading in the year 2003-04 when its value was 0.57.

Year 2003-04 onward, it had been lower than 1 which indicates that international prices remained comparatively higher than domestic prices.

The interpretations of NPC and EPC are supported by export figures of wheat in the years 2003-04 onwards. Total exports of the wheat were 4093080.52 MT in 2003-04 and in 2012-13, total exports were 6514810.60 MT valued at Rs. 10529 crore. It was the year



which recorded highest export surplus value in the last 20 years i.e. from 1995-96 to 2014-15. The total imports during this year stood at 2943.89 MT and valued at Rs. 1.11 crore, thus resulting in export surplus of Rs. 10527.89 crore. Next year 2013-14 also recorded an impressive increase but was slightly less than the previous year. Year 2013-14 recorded total exports of 5562374.74 MT valued at 9261.61 crore while imports were 11271.39 MT valued at 4.42 crore. It resulted into export surplus of Rs. 9257.19 crore. Provisional figures of the wheat exports indicated a similar trend with total export surplus of Rs. 4982.31 crore in wheat trading till December 2014. Wheat exports have been mainstay of the total exports of agricultural commodities from India and helps in bring volume of foreign exchange to the government's reserve.

## V Rice Competitiveness of Indian Agriculture

Export competitiveness of rice has been studied for two states namely Punjab and Andhra Pradesh. For Punjab Rice, price of

Parmal variety in Delhi Market has been considered as representing domestic price. For Andhra Pradesh rice, price of Misuri variety was considered. Further, For Punjab rice, world reference price has been adjusted for domestic marketing and transportation cost between ports viz. Mumbai and Delhi.

Export competitiveness of rice have studied for a period of 20 years i.e. from 1995-96 to 2014-15. Rice being the most traded commodity from India provides some additional advantage to the nation when it is about exports of basmati rice. Though government keeps tracking the exports of basmati rice from India to rein in the domestic prices of basmati rice, overseas and international demand for basmati remains constantly high. Non-basmati also constitute a major chunk of Indian rice exports but demand for non-basmati rice have seen sharp up and downs because of stiff competition from neighboring nations. For analysis purpose, domestic and international prices of basmati rice have taken into calculation of NPC and EPC. The results are as below:

**Table 2**  
**Domestic and International Prices of Basmati Rice**

Year	Domestic Price	World Price	NPC	(Rs/Quintal)		
				Value Added Domestic Price	Border Price	EPC
1995-96	748.77	1080.87	0.69	816.16	1113.30	0.73
1996-97	824.92	1011.53	0.82	899.16	1041.88	0.86
1997-98	1099.79	1156.94	0.95	1198.77	1191.65	1.01
1998-99	1083.71	1067.83	1.01	1181.24	1099.86	1.07
1999-00	1082.39	993.55	1.09	1179.81	1023.36	1.15
2000-01	923.66	829.49	1.11	1006.79	854.37	1.18
2001-02	1089.92	1384.20	0.79	1188.01	1425.72	0.83
2002-03	978.54	1280.98	0.76	1066.61	1319.41	0.81
2003-04	950.52	876.98	1.08	1036.07	903.29	1.15
2004-05	1001.63	956.87	1.05	1091.78	985.58	1.11
2005-06	1065.76	1176.98	0.91	1161.68	1212.29	0.96

2006-07	969.98	1009.56	0.96	1057.28	1039.85	1.02
2007-08	991.65	1004.65	0.99	1080.90	1034.79	1.04
2008-09	1056.76	1368.98	0.77	1151.87	1410.05	0.82
2009-10	1102.54	1290.09	0.85	1201.77	1328.79	0.90
2010-11	1082.66	1284.87	0.84	1180.10	1323.42	0.89
2011-12	980.74	1106.78	0.89	1069.01	1139.98	0.94
2012-13	1000.69	1254.45	0.80	1090.75	1292.08	0.84
2013-14	1163.91	1378.95	0.84	1268.66	1420.32	0.89
2014-15	1187.71	1369.40	0.87	1294.60	1410.48	0.92

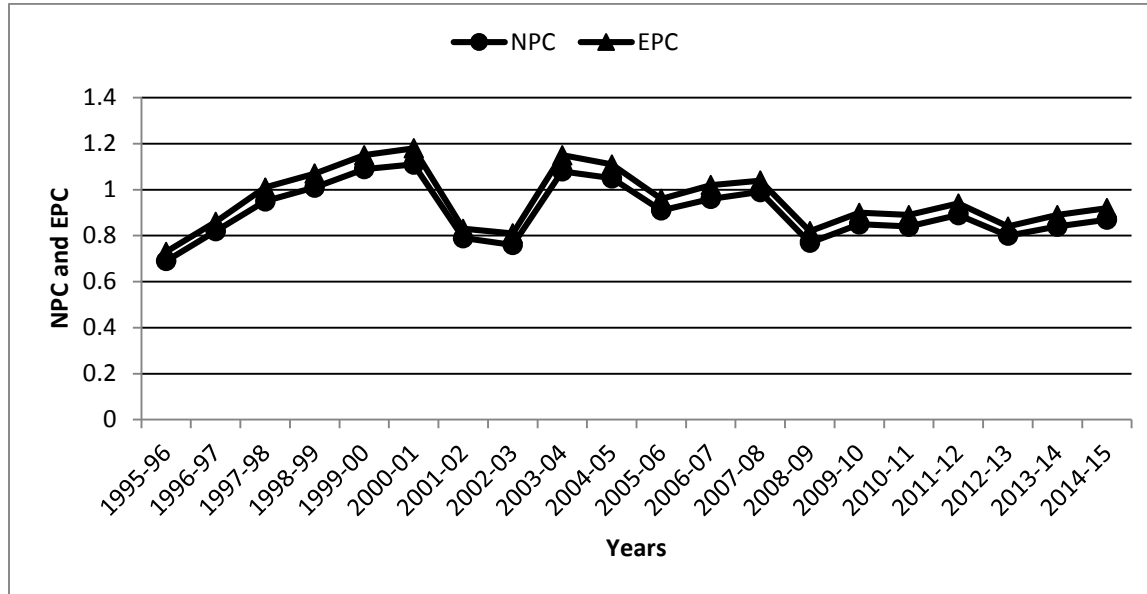
**Source:** Same as table 1.

It is cleared from table 2 that the analysis of export competitiveness from 1995-96, we observe that the difference between world reference price and domestic price for the rice was more than Rs. 300 per quintal which led NPC to 0.69 indicating that rice in the particular year was exportable commodity as the international market had been offering better price than the domestic price. But local consumptions and quota imposed by the government, at times, discourages the exports despite attractive prices in international market. Years having NPC value between 0.70 to 1.00 had no considerable difference in the world reference prices and domestic price thus the producing countries would find it difficult to decide whether to sell the stocks or keep it for local markets or wait for price correction in international markets.

In the year 1998-99, NPC was above unity i.e. 1, an indication of higher domestic prices than world reference prices. Such scenario is not export friendly and producers should remain away from large volume exports as it won't fetch any considerable advantage.

Price being received into international market place is almost available in local markets. Whereas exports in such a case will only add to the transportation and other cost which will directly bear upon the net profitability of the trade. In the year 1999-2000 also, the domestic prices remained higher than world reference price and NPC pegged to 1.09. Simultaneously, the EPC of this year was 1.15, clearly representing the additional costs to exports and narrowing the difference of price gap. The price gap grew from Rs. 16 in 1998-99 to Rs. 89 per quintal in the year 1999-2000. This difference continued to increase to Rs. 94 per quintal of basmati rice in the year 2000-01 and NPC remained high at 1.11. This indicates the downward trend in international prices and comparatively higher prices at domestic market. Reduction in international prices may happen for a slew of reason like bumper production in producing countries, reduced demand as compared to earlier years, quality distortions, war and recessions in economies. The following figure illustrates NPC and EPC:

**Figure 2**  
**NPC and EPC of Rice**



Source: Table 2.

A sudden correction in the international prices was observed in the year 2001-02 with the NPC posing a pleasant figure of 0.79 indicating the increase of world reference prices and it was construed as export friendly year. Further, the coming year 2002-03 also posed NPC at 0.76, again indicating that world reference prices remained higher than the domestic prices. The export rally had a break in the coming year 2003-04, when world reference price again came down and domestic prices remained high. NPC was alarming 1.08. Though there has been a correction in the world reference prices in the coming 4 years in a row, but it was not as considerable as it was in 2001-02 and 2002-03. Year 2004-05 had NPC of 1.05, again discouraging figure for exporters, and year 2005-06 had NPC of 0.91, giving little comfort to the exporters and they could offload their stock holdings now through exports for a little higher prices than domestic market. Year 2006-07 and 2007-08 witnessed the erosion of price difference by posing the NPC 0.96 and 0.99 respectively.

NPC ranging from 0.95 to 0.99 brings prices almost at par and it is advisable to sell stocks in local markets than scouting for export orders.

Since 2007-08, world reference prices for the rice are on correction and NPC also posing export favorable figures. Year 2008-09 had NPC at 0.77, much better than its previous year and indicated the export times. Further the NPC for the year 2009-10, 2010-11, 2011-12, 2012-13, 2013-14 and 2014-15 had been 0.85, 0.84, 0.89, 0.80, 0.84 and 0.87 respectively. All these years have been export friendly and it is supported by the statistics of the exports of the basmati rice in these years. Total exports of basmati rice in 2009-10 was 2016775.33 metric ton (MT), in 2010-11 exports were 2370658.39 MT, in 2011-12 exports were 3178174.43 MT, in 2012-13 exports were 3459898.93 MT, in 2013-14 exports were 3757271.42 MT and in last year 2014-15, exports were 3702260.07 MT.

Effective protection coefficient moved almost in tandem with NPC with slight upward or downward movement in some



years, but it was marginal only. No considerable or out of trend movement was noticed. For calculation of EPC, value added in domestic prices and border prices have been taken into consideration.

## VI Conclusion

To conclude, it has been observed that calculated values of NPC and EPC were in tandem with the actual export performance of wheat and rice. NPC and EPC's value higher than one indicated that domestic prices were higher than international market prices or world reference prices. It could have been because of government's protection policies and restriction on trading of a particular commodity. If the protection of the particular commodity is higher and effective, prices are most likely to get stabilize and remain above than average prices. Among different crop groups rice and wheat have enjoyed most favourable price environment because of strong government support in raising their support prices.

In total, it is concluded that Indian agriculture is getting competitive advantage in international trade provided it needs more structured and sophisticated information sharing system in place and improved infrastructure for handling of surplus stocks. It is suggested that special campaign is required to create awareness about quality aspects of farm produce among the farming community, traders, consumers and exporters. This process will go a long way in making Indian agricultural products competitive in the international market.

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