

INDIA'S EXPORT OF CEREALS AND CEREAL PREPARATIONS – A CONSTANT MARKET SHARE ANALYSIS

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ABSTRACT

From food grains importing country in 1950s and 60s there is a turn around and now India has become the exporter of food grains to the world. India, the third largest economy of Asia, is the leading producer for several agricultural products. Nearly 60 per cent of Indian population is dependent on the agriculture for their livelihood. In relation to the size of the Indian agriculture the presence of this sector in the international market is modest in size. After liberalisation policy was adopted in 1991 there is a shift in government of India's policy from import substitution of the agro products to the export promotion. Present paper explores the growth and performance of the export of one of the most important agricultural good i.e., cereals. Cereals are exported in raw, semi processed and fully processed form. The commodity group is one of the largest foreign exchange earners in the last two decades. The study explores at length the causes of lack of growth using the decomposition model of Constant Market Share Analysis.

Keywords: Cereals Export, Competitiveness, Constant Market Share Analysis

INTRODUCTION

Economic reforms and qualitative improvement in agriculture operation have enhanced the supply capacity of Indian agriculture. India has a unique opportunity to substantially increase its exports of agricultural products – particularly in the free trade regime under World Trade Organization. From a phase of gradual export orientation, the agricultural sector in India has entered into a new phase of globalisation with the implementation of the various provisions of WTO (as and when they are made applicable to India). India being a major negotiator on world agriculture trade, it can be expected that Indian agriculture trade will expand in the years to come. This process started with the India signing the Agreement on Agriculture (AOA) during the Uruguay Round.

Cereals and cereals preparations are one of the major foreign exchange earners for the country. Basmati and non-basmati rice are the major items of agricultural exports of India. India's cereals exports can be divided into two broad categories, i.e. export of a) unprocessed products, and b) processed products. Unprocessed products are essentially of low value high volume nature, while processed products are of high value but low volume nature. Among various agricultural commodities exported by India cereals and cereals preparations ranked fourth in 1991 in terms of its value of export earnings, whereas in the year 2009 it ranks first behind none. Export earnings from cereals and their preparations increased from 367.9 million USD in 1991 to 3116.3 million USD in 2009. The earnings from cereals and cereals preparations increased gradually till 1994, thereafter the rise is three fold from 408 million USD in 1994 it increased to 1213.4 million USD in 1995, then with a decline for next two years in 1998 the performance was good with export value at 1349.12 million USD.

Nearly 95 per cent of the total earnings were from the export of unprocessed cereals. Amongst the unprocessed cereals basmati rice and non-basmati rice form a larger percent of the total cereal exports from India. Unprocessed cereals have greater demand in the Asian countries. Asia is the largest stable and growing market. Asian countries such as Saudi Arabia, UAE, Kuwait, Malaysia, Bangladesh, Singapore, Oman and Sri Lanka are traditional markets and Pakistan, Iran, Vietnam, Nepal, Taiwan, Indonesia, Sudan, Kenya and Jordan have emerged as new market for cereals and cereal preparations.

With improved technology and world class quality standards in agro processing units India has the potential to penetrate in European and American markets. The value added export of processed cereals offer tremendous potential to India. Indian cereals and cereal preparations have experienced faster growth and higher instability as compared to that of world export during the period under observation.

LITERATURE REVIEW

Hosamane et al (2006) examine the export behavior of principal commodities during pre and post reform period using the Constant Market Share Analysis. **Hugar L B (2002)** uses the Markov Chain Approach to analyze Onion Export Markets and its Stability for increasing India's exports. **Rajagopal (2000)** the liberalised economic policies are helping the economy in a positive direction in global perspective. From export potential point of view he finds that rice has greater competitiveness. Sananse et al (2004) study basmati rice export. The existing research concentrates only on cash crops or the particular segment of cereals and cereals preparations. Further many studies like Nageshwara et al (2009), Shinoj P et al (2008), Sathe D and R S Deshpande (2006) Singh and Goyal (2004), Goyal S K et al (2000) Kaushik K K et al (2000) are either using revealed comparative advantage method or the instability indices for analyzing the advantage of agricultural products in the international market. Kehar Singh et al (2003) study the prospects of agricultural exports of India using composite index approach. Anjani Kumar (2004) has used Ordinary Least Square and Hugar L B (2002) uses the Markov Chain Approach to analyze Onion Export Markets and their Stability for increasing India's exports.

In light of the reviewed literature the present study uses Constant Market Share analyzing the competitiveness and decomposing the growth of cereals and cereals and cereals preparations export from India.

OBJECTIVE OF THE STUDY

To study growth and competitiveness of cereals and cereals export from India

METHODOLOGY

The study is based on the time series data from 1991 to 2009 of value of export (US \$) as per 2 digit Harmonised System (HS) classification related to Indian export of cereals and cereals preparations. The time series data was collected from electronic data base of Ministry of Commerce, Government of India, Commodity Trade Statistics (COMTRADE) of United Nations, Food and Agricultural Organization's TRADESTAT and Foreign Trade and Balance of payment published by Centre for Monitoring Indian Economy.

Constant Market Share Analysis

The method chosen in this study is based on Fredrik et al (2006) and Juswanto and Mulyanti (2003). This version of the CMS is also used by Lerner and Stern (1970) and Merkie and Van der Meer (1988) when they supported the theoretical foundation of CMS. The CMS analysis is always based on the assumption that a country's share of exports in world imports should be constant. If the share in world imports changes, there is a difference between the constant market share norm and the actual export performance. The actual export performance could then be decomposed into four components: (i) a market share effect, (ii) a commodity composition effect, (iii) a market distribution effect and (iv) a competitiveness effect.

In order to describe India's agricultural export decomposition, we need following variables:

V_i = Value of India's exports of cereals and cereal preparations in period 1.

V'_i = Value of India's exports of cereals and cereal preparations in period 2.

V_j = Value of India's agricultural exports to continent j in period 1.

V'_j = Value of India's agricultural exports to continent j in period 2.

V_{ij} = Value of India's exports of cereals and cereal preparations to continent j in period 1.

V'_{ij} = Value of India's exports of cereals and cereal preparations to continent j in period 2.

r = Percentage increase in world exports of agriculture from period 1 to period 2.

r_i = Percentage increase in world exports of cereals and cereal preparations from period 1 to period 2.

r_{ij} = Percentage increase in world exports of cereals and cereal preparations to continent j from period 1 to period 2.

ΔX_c = Absolute change in India's agricultural exports between period 1 and period 2.

It follows from the above definitions that for period 1 the value of India's agricultural exports is

$$\sum_j V_{ij} = V_i \quad (1)$$

$$\sum_i V_{ij} = V_j \quad (2)$$

Equations (1) and (2) respectively are the total export of cereals and cereal preparations and total export to continent j in period 1,

Where

V_{ij} is the value of India's export of cereals and cereal preparations to continent j in period 1

V_i is summation of value of India's export of cereals and cereal preparations to continent j in period 1 which can also be written as $\sum_j V_{ij}$

$V.j$ is the value of India's agricultural exports to continent j in period 1

Similarly we can find the value of India's agricultural export to continent j for period 2.

$$\sum_j V'_{ij} = V_i \quad (3)$$

$$\sum_i V'_{ij} = V'.j \quad (4)$$

Equations (3) and (4) respectively are the total export of cereals and cereal preparations and total export to continent j in period 2

Where

V'_{ij} is the value of India's exports of cereals and cereal preparations to continent j in period 2

V'_i is summation of value of India's exports of cereals and cereal preparations to continent j in period 2 which can also be written as $\sum_j V'_{ij}$

$V'.j$ is the value of India's agricultural exports to continent j in period 2 In addition, the value of India's agricultural exports in period 1 is given by –

$$\sum_i \sum_j V_{ij} = \sum_i V_i = \sum_j V.j = V.. \quad (5)$$

Where $V..$ is total value of agricultural export of India which is arrived at by summation of value of India's exports of cereals and cereal preparations in period 1 or it is equal to the summation of value of India's agricultural exports to continent j in period 1. This can also be written as $\sum_i \sum_j V_{ij}$. Similarly, it can also be written for period 2.

$$\sum_i \sum_j V'_{ij} = \sum_i V'_i = \sum_j V'.j = V'.. \quad (6)$$

Where $V'..$ is total value of agricultural export of India which is arrived at by summation of value of India's exports of cereals and cereal preparations in period 2 or it is equal to the summation of value of India's agricultural exports to continent j in period 2. This can also be written as $\sum_i \sum_j V'_{ij}$. Assuming that exports are completely undifferentiated with respect to commodity and region of destination, when applying the constant share norm, we get equation (7)

$$V'.. - V.. \equiv \Delta X_c \equiv rV.. + (V'.. - V.. - rV..) \quad (7)$$

Where,

$(V'_{..} - V_{..} - rV_{..})$ is unexplained residual.

$V'_{..} - V_{..}$ is the difference in the total value of agricultural export of India between period 2 and period 1. This difference is approximately equal to ΔX_c which in turn is equal to $rV_{..} + (V'_{..} - V_{..} - rV_{..})$. That is, if India maintained its market share, then exports would increase by $rV_{..}$ and the growth in exports could be divided into one part associated with general increase (shown by $rV_{..}$) in world exports and an unexplained residual, which is called the competitiveness effect. A positive competitiveness could be attributed to a decrease in India's relative export price while a negative competitiveness likewise could be attributed to an increase in the India's relative export price.

With the definitions and identities given in equation 1 to 7, we can now proceed to the complete decomposition of identity as shown in equation (8), wherein we consider exports to differ not only with respect to commodities, but also with respect to destinations. The argument for the latter division is to take into account that India might have easy access to fast growing countries through historical patterns, geographic proximity or trade agreements while it may not have similar access to other countries. The identity presented in equation (5) can be presented in the following form -

$$V'_{ij} - V_{ij} \equiv r_{ij} V_{ij} + (V'_{ij} - V_{ij} - r_{ij} V_{ij}) \quad (8)$$

Where, $(V'_{ij} - V_{ij} - r_{ij} V_{ij})$ is unexplained residual.

In equation (8) above the difference between the value of India's exports of cereals and cereal preparations to continent j in period 2 and the value of India's export of cereals and cereal preparations to continent j in period one is approximately equal to percentage increase in world exports of cereals and cereal preparations to continent j from period 1 to period 2 multiplied by value of India's export of cereals and cereal preparations to continent j in period 1. The growth of India's export divided into a part associated with the general increase in world export and an unexplained residual, at an aggregated level, is equal to:

$$\Delta X_c \equiv \sum_i \sum_j (V'_{ij} - V_{ij}) \equiv \sum_i \sum_j r_{ij} V_{ij} + \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij}) \quad (9)$$

The total change in India's exports, ΔX_c in Equation (9) can be decomposed into four components:

$$\begin{aligned} &\equiv \sum_i \sum_j (r - r + r_i - r_i + r_{ij}) V_{ij} + \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij}) \\ &\equiv \sum_i \sum_j (rV_{ij} - rV_{ij} + r_i V_{ij} - r_i V_{ij} + r_{ij} V_{ij}) + \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij}) \\ &\equiv \sum_i \sum_j rV_{ij} + \sum_i \sum_j (r_i - r)V_{ij} + \sum_i \sum_j (r_{ij} - r_i)V_{ij} + \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij}) \\ &\equiv \sum_i rV_{i.} + \sum_i (r_i - r)V_{i.} + \sum_i \sum_j (r_{ij} - r_i)V_{ij} + \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij}) \\ &\equiv \underbrace{rV_{..}}_{(1)} + \underbrace{\sum_i (r_i - r)V_{i.}}_{(2)} + \underbrace{\sum_i \sum_j (r_{ij} - r_i)V_{ij}}_{(3)} + \underbrace{\sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij})}_{(4)} \quad (10) \end{aligned}$$

In equation (10), the four components are -

1. $rV_{..}$ is the general rise in world export or Market share effect (MS)

2. $\sum_i (r_i - r) V_i$ is the commodity composition of India's exports in period 1 (CC)
3. $\sum_i \sum_j (r_{ij} - r_i) V_{ij}$ is market distribution of India's export (MD) , and
4. $\sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij})$ is the residual reflecting the difference between actual export

growth and growth that would have occurred if India would have maintained its share of export of each commodity to each continent (CE).

a) Market Share effect or World Trade Effect (MS): The change in exports attributable to the general change in world exports. It is the hypothetical growth that would have occurred if India had increased its exports at the same pace as world imports have increased.

b) Commodity Composition effect (CC): Measures whether India in period 1 has focused on commodities that grew relatively fast, or slowly, between period 1 and period 2. The value is positive if India has concentrated its exports on commodities with growth rates that are higher than the world average. Similarly, the value is negative if India has focused on slowly growing commodity markets.

c) Market Distribution effect (MD): Measures whether India in period 1 concentrated on destination markets that experienced relatively rapid, or slow, growth between period 1 and period 2. The value is positive if India has concentrated its exports to markets that are growing relatively fast and negative if they are growing relatively slowly.

d) Competitiveness Effect (CE): The residual reflects the difference between the actual export growth and the export that would have occurred had India maintained her share in all markets for all commodities. A negative value implies that India has failed to maintain market shares in all markets for all commodities, i.e. its competitiveness has decreased. A positive value means it has increased her market shares in all markets for all commodities, i.e. competitiveness has increased.

The first three effects i.e., MS, CC and MD represent the growth of exports which would result if the country maintains constant market share in each market. These three effects are jointly referred to as structural term. The fourth effect, the competitiveness effect, may be considered as an unexplained residual. It captures the effect of changing market shares. If the value of CC is negative, then the country grows slower than it should have given the constant market share norm. If the value of CC is positive, the country grows faster than it would have given the constant market share norm. This implies that although the market share effect might imply that the country grows faster than the world and that it is increasing its market shares, it might still grow slower than it should have had it maintained its market shares in all markets for all commodities. Thus, a country might display a negative competitiveness despite having increased its world market shares.

Beside the absolute values that are calculated by using the variables shown in equation 10, relative values could facilitate interpretation as well as comparison between the commodities. The relative values are calculated by dividing the absolute effects by the actual changes in exports of commodities. This kind of relative values clarify to what extent the different effects contribute to the total change in exports. The relative values create some complications, when the actual export change is negative. In such situations, in order to get the correct sign (negative or positive) on the relative value and interpret the relative value correctly, absolute values of the changes may have to be used in the calculations.

Taking the relative market share effect MS% as an example, the absolute value is always positive if the country's export to the world exports has increased over the period. If $\Delta X_c > 0$, and $MS\% > 100$ implies that the change in country exports is smaller than the increase would have been had it followed the increase of world exports. Likewise, if $\Delta X_c > 0$, and $MS\% < 100$ it implies that the change in country exports is larger than the increase would have been had it followed the increase of world exports. Essentially, the smaller the value of MS%, the more the country increases its exports relative to the world. If, on the other hand, ΔX_c is < 0 , then the absolute value is used in order to get the correct sign (positive or negative) on the relative effect. As the change in exports is negative, it is obvious that the country is loosing share in world markets but further information cannot be revealed.

FINDINGS AND RESULTS

Cereals and cereals preparation are one of the most important foreign exchange earning groups amongst the agricultural commodities. The absolute values of change in export in Figure 1 shows that Indian cereals and cereals preparations have increased for most of the years except the poor performance in four periods i.e., 1996-1997, 1999-2000, 2005-2006 and 2008-09. For these four years there was a decline in the export value. The negative values of change in export indicate the decline in the export value. During these four years India lost its share in the world market.

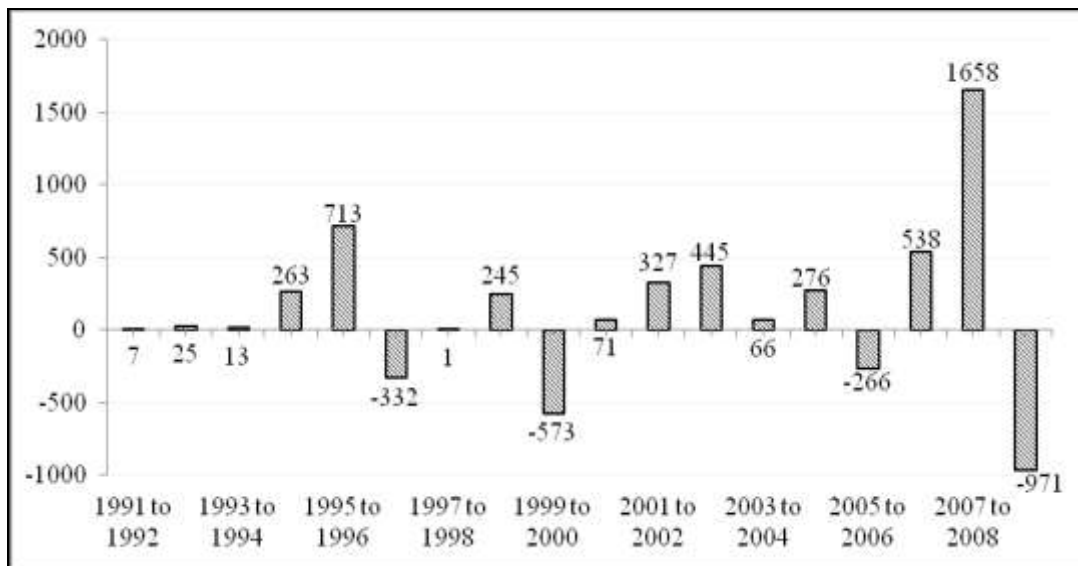


Fig. 1. Change in India's export of Cereals and Cereals Preparations (Value in Million USD)

Competitiveness effect reveals that only for the 1992-1993, 1997-1998, 1998-1999 and 2000-2001 it was positive and the corresponding data related to CE% for the same years is greater than 0 depicting that during these years Indian cereals group have greater increase in its competitiveness. Rest of the years when CE% is less than 0 indicate that there has been a reduction in the competitiveness of Indian cereals. Thus we may conclude that despite having the highest share in agricultural export of India, cereals and cereals preparations have not kept pace with the growth rate experienced by the world export of cereals and cereals preparations.

The lack of growth between 2005 and 2006 is serious since total world exports as well as the cereal import of the world have increased. Hence during the study period 14 years have positive export growth of this group. In 1991-1992, 1994-1995 and 2003-04 the values of market share, commodity composition and market distribution for cereals and cereals preparations export from India are positive. This means the growth in these years is due to increasing market share with focus on faster growing commodities as well as markets.

Table 1. Constant Market Share Analysis result for Cereals and Cereal Preparations

Year From - To	Absolute Effect (Values in Mn USD)					Relative Effect (Percentage)				
	Δ Xc	MS	CC	MD	CE	Δ Xc	MS	CC	MD	CE
1991-1992	6.6	2865.5	3368.0	943.6	-7170.5	100	43538.6	51174.4	14337.5	-108950.4
1992 - 1993	24.7	-3060.3	-1660.2	788.5	3956.7	100	-12373.6	-6712.6	3188.3	15998.0
1993 - 1994	13.1	4543.9	-3266.6	1041.3	-2305.6	100	34791.9	-25011.8	7973.4	-17653.5
1994 - 1995	263.3	4837.7	1872.7	2088.7	-8535.8	100	1837.4	711.3	793.3	-3242.0
1995 - 1996	712.6	3070.0	5962.8	-247.1	-8073.1	100	430.8	836.8	-34.7	-1132.9
1996 - 1997	-331.5	-3944.2	-15495.2	-3898.5	23006.3	100	1189.7	4674.0	1175.9	-6939.7
1997 - 1998	0.8	-3389.7	-3237.8	-3258.9	9887.2	100	-418483.3	-399727.3	-402331.9	1220642.5
1998 - 1999	244.9	-2219.9	701.7	813.6	949.4	100	-906.5	286.6	332.2	387.7
1999 - 2000	-573.3	-1260.7	-598.6	1019.4	266.6	100	219.9	104.4	-177.8	-46.5
2000 - 2001	70.7	1529.9	-1514.2	-3308.5	3363.5	100	2163.6	-2141.4	-4679.0	4756.8
2001 - 2002	326.7	2505.4	2560.0	-2327.6	-2411.1	100	767.0	783.7	-712.6	-738.1
2002 - 2003	445.2	16187.0	-3104.6	-5027.4	-7609.7	100	3635.5	-697.3	-1129.1	-1709.1
2003 - 2004	66.4	20015.7	4232.3	5938.4	-30119.9	100	30136.1	6372.2	8941.0	-45349.4
2004 - 2005	275.8	10006.6	-8926.2	-374.7	-430.0	100	3628.9	-3237.0	-135.9	-155.9
2005 - 2006	-265.6	16500.4	2310.7	-2776.7	-16300.0	100	-6211.7	-869.9	1045.3	6136.3
2006 - 2007	538.0	27886.8	14373.5	-1258.5	-40463.7	100	5183.2	2671.5	-233.9	-7520.9
2007 - 2008	1658.0	73633.9	-16424.1	7241.6	-62793.4	100	4441.1	-990.6	436.8	-3787.3
2008 - 2009	-970.5	-50669.6	-47689.3	-6656.5	104044.9	100	5221.0	4913.9	685.9	-10720.8

Note: MS - Market share Effect, CC - Commodity Composition Effect, MD - Market Distribution Effect, CE – Competitiveness Effect.

Source: Researcher’s calculation based on the data collected from various issues of CMIE’s publication on Foreign Trade and Balance of Payments and FAO’s TRADESTAT.

Out of 14 years there is positive market share effect for 12 years. Moreover this trend is continuous from 2000 to 2008. The corresponding values of relative market share (MS%) are positive for all the years except for 2005-06. The positive values of relative market share are greater than 100% indicating that for the years 1995-96 and 2001-02 there has been a lesser decline in the market share of Indian cereals and cereals preparations as compared to that of other years during observation. For the years 1992-93, 1997-98 and 1998-99 the MS% values are negative which means India lost its market share.

CONCLUSION

Asia is the largest market, importing unprocessed cereals from India. The growth in the cereals and cereals preparation export is largely due to markets share effect. Demand from European, American and Oceanic markets is mainly of the processed and semi processed cereals. The lack of growth is due to commodity composition. Market distribution effect reveals that Indian cereals did not gain much on account of growing world markets. The relative values of competitiveness effect are negative for large number of years for the period under observation. Indian cereals export has lack of competitiveness largely due to market distribution followed by commodity composition. It is necessary that India focuses on export of cereal preparations and value added products.

FUTURE SCOPE OF THE STUDY

The study can be taken further by exploring area concerning different determinants of export such as increase in productivity, standardization, value addition, supply chain management, processing, packaging, and marketing and brand development. A study related to sanitary and phyto-sanitary measures can also be taken up. On the policy front the impact of policy measures on cereals agricultural export of India can be studied. The effectiveness of the formulation of focus market policy of Government of India can be further examined.

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