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INDIA'S BURGEONING FOOD SUBSIDIES: HOW MUCH CAN WE BLAME THE FOOD CORPORATION OF INDIA?

ABSTRACT

The Food Subsidy Bill of the Government of India has increased manifold in the past decades. The Food Corporation of India (FCI) is responsible for ensuring that the subsidy reaches both the producers through the support prices and to the consumers through the Public Distribution System (PDS). The high economic costs of the Food Corporation, along with low PDS prices contributes to the rising food subsidy bill. Some parts of this economic costs are within the purview of the FCI while others are completely outside its domain. Hence this paper attempts to ascertain the factors leading to the increasing food subsidy and the extent to which these are attributable to the FCI. We find that, in fact, some of the major components of the economic costs, which are leading to rising food subsidy, are not within the control of the FCI and to that extent, the parastatal can be absolved of the blame. The villain of the piece appears to be the support price policy of the government and some components of the economic cost of FCI, which are outside the purview of the FCI. The paper also delves into analysing the cost components of FCI in an attempt to assess the performance of the parastatal itself.

Key Words: Food Subsidy, Economic Costs, Sales Realisation

JEL Classification: H23

RIASSUNTO

Sussidi alimentari crescenti in India: quanto possiamo ritenere responsabile la Food Corporation of India?

Il Food Subsidy Bill del governo indiano è cresciuto secondo molte modalità negli ultimi decenni. La Food Corporation of India (FCI) è responsabile della destinazione dei sussidi affinché siano assegnati ai produttori attraverso il sostegno ai prezzi ed ai consumatori tramite il Public Distribution System (PDS). Gli elevati costi della Food Corporation, insieme ai bassi prezzi del PDS, contribuiscono al sorgere del conto sussidi agli alimentari. Parte di questi costi

rientrano nelle competenze della Food Corporation, mentre altri sono completamente al di là del suo ambito di attività. A questo proposito questo lavoro cerca di individuare i fattori che portano ad un incremento dei sussidi alimentari e in che misura questi fattori siano attribuibili alla Food Corporation. Sono state riscontrate evidenze che alcune componenti dei costi che causano gli elevati sussidi non rientrano tra le competenze della Food Corporation e di conseguenza l'ente statale non ne può essere ritenuto responsabile. I responsabili sembrerebbero essere la politica di sostegno ai prezzi condotta dal governo e alcune componenti di costo che sono al di fuori delle competenze della Corporation stessa. Questo studio approfondisce anche l'analisi delle componenti di costo della Food Corporation nel tentativo di valutare l'efficienza dell'ente stesso.

1. INTRODUCTION

With the aim of providing food security, the Government of India has one of the largest food subsidy programs in the world (Sharma, 2012). This entails acquisition of grains from the farmers at an assured price and distribution of grains to the consumers at well below the market prices. The parastatal involved in this subsidy program is the Food Corporation of India (FCI). The subsidy bill for the government has almost doubled in the last four year period from Rs 68,697 crores in 2011-12 to a budgeted amount of Rs 1,34,835 crores as food subsidy for 2016-17.

In acquiring grains, the FCI pays the centrally determined support prices to the producers and distributes the same to the consumers at the Central Issue Prices (CIP) which is also determined by the Central government. The FCI, however, has to manage the grains by first procuring, then storing and finally distributing it. Accordingly the FCI incurs costs over and above the procurement prices which are called procurement incidentals and distribution costs. The several components of the cost are jointly called the economic costs of the FCI, which is much higher than the sales realization of the FCI. The Central government fills in this gap and provides it as subsidy to the FCI.

Thus, food subsidy is the difference between economic costs and the sales realization of the FCI. Hence analysing the economic costs of FCI and its components would help us ascertain which component of the economic cost of FCI is the culprit, leading to the burgeoning subsidy bill. This paper attempts to estimate a model which examines the determinants of food subsidy, which

include the various components of economic cost of FCI (some components of which are within the purview of FCI) and also the procurement price and central issue price (which are set by the Central government and entirely outside of the purview of FCI). Section 2 elaborates on the economic cost of FCI. In Section 3 we estimate three variants of our model identifying the various factors affecting food subsidy including variables both within and outside the purview of FCI. Section 4 delves further into the various cost components of FCI so as to assess the performance of the parastatal itself. These indicators also serve as a robustness check for the findings of our regression models. Section 5 looks at some additional indicators which throw light on the financial performance of FCI. Section 6 concludes.

2. ECONOMIC COST OF FCI

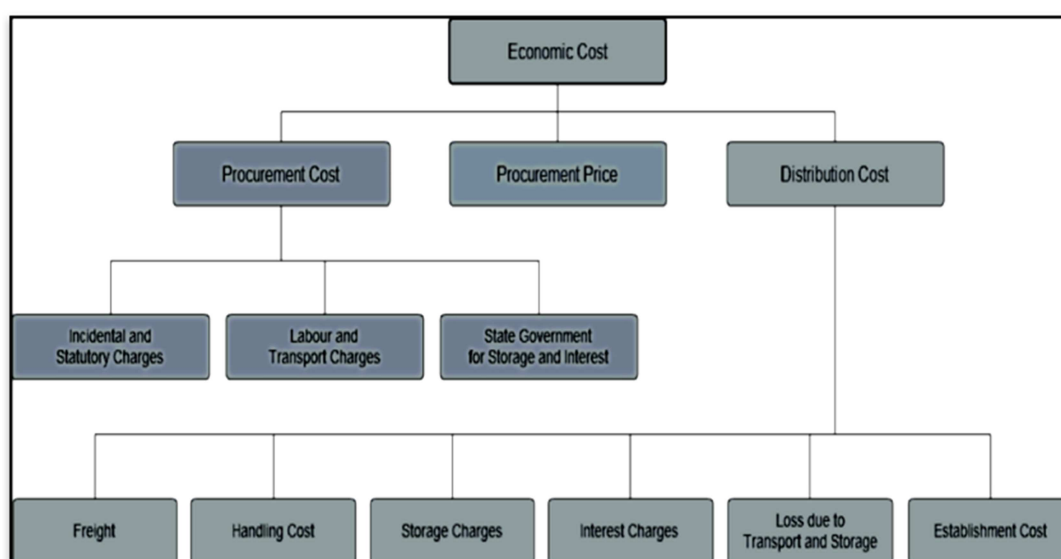
The Food Corporation of India (FCI) was set up in 1965, under the Food Corporation Act, 1964. In the mid-sixties, India witnessed a major shortfall in food grains, especially wheat. The country was importing around 6 to 7 million metric tonnes of wheat and the country's production was only 10 to 12 million metric tonnes. Forex reserves available were not sufficient for such high import volumes and self sufficiency in food grains became a primary objective of the Government. The Agricultural Prices Commission was set up in 1965 to recommend prices which would be remunerative to farmers and the FCI established in the same year was expected to be its counterpart in leading the country towards self sufficiency. FCI is an institution under control of the Ministry of Consumer Affairs, Food and Public Distribution, which is also responsible for implementation of the National Food Security System. In the fifty years since its inception, FCI has emerged as a primary establishment of the Government to implement all policies concerning food security in India. The main objectives of the Corporation are to provide producer subsidy by providing price support to the farmers, distribution of the food grains to the consumers through the Public Distribution System and ensuring national food security by maintaining adequate buffer stock of food grains. In fulfilling these objectives, the FCI was expected to operate competitively with private traders but also focus on social gains. The FCI has often come in for criticism for its operational inefficiencies leading to high costs, even though a large part of its costs are determined by Government policies.

The increasing subsidy burden and the role of FCI as a parastatal institution has been the subject of discussion of several studies. Sharma (2012), Sharma and Alagh (2013) have studied the

factors affecting the food subsidy and claimed that procurement prices affect food subsidy significantly. George (1996) claims that the total consumer subsidy in the country depends on procurement prices, handling charges and the issue prices. Hence, in order to reduce the subsidy burden, the procurement price policy as well as the issue prices need to be reviewed. The role of FCI in the increasing subsidy bill has also been widely discussed. Increased procurement by FCI has led to higher food stocks, higher inflation for food grains and a higher food subsidy (Virmani and Rajeev, 2001). Research Papers by Gulati *et al.* (2000), ASCI(2001), Swaminathan (1999), Jha and Srinivasan (2004) also examine major issues related to this institution. The major focus of these studies has been to analyse the costs of the FCI along with suggestions for increasing its efficiency. They also do a comparison of FCI's functioning with that of the private traders and provide alternative policy suggestions and discuss the possibility of liberalised international trade to ensure availability.

The performance of FCI in terms of its operational costs has been analysed by several authors (Gulati *et al.*, 1996 and Jha and Srinivasan, 1999) etc. The main elements in the costs of FCI are procurement costs, distribution costs and buffer costs. Section 2 below elaborates on the components of the Economic Cost of FCI. Figure 1 shows the various components of Economic Costs of FCI.

FIGURE 1 - Cost Components of FCI



Source: Swaminathan (1999).

The economic cost of the FCI broadly comprises of procurement costs, procurement price and the distribution costs. Procurement price is the Minimum Support Price (MSP) paid to the farmer. Procurement costs or procurement incidentals include the statutory charges like mandi charges, purchase tax, and non-statutory charges like mandi labour and carry over charges. Procurement incidentals also include the payments made to State Governments for custody and interest. The distribution costs include the costs involved in allocation and distribution of grain to various states and union territories. These include freight charges, handling and storage losses, interest and administrative charges. The FCI issues the grains through the public distribution network of fair price shops at the Central Issue Prices (CIP) fixed by the Government. Procurement price and procurement incidentals are outside the domain of FCI while distribution costs is the only component of economic cost, which is under the control of FCI. In Section 3 below we estimate models which ascertain the determinants of food subsidy.

3. DETERMINANTS OF FOOD SUBSIDY

In this section, we attempt to analyse and ascertain the major determinants of food subsidy by estimating three variants of our model. The first variant is the base model following the methodology outlined by Sharma (2012) and Sharma and Alagh (2013). The model has been estimated for an extended period of time i.e.1992-93 to 2014-15. Another modification that we introduce to this base model is the introduction of a dummy variable for the period after 2006-07 to take care of an accounting change¹. The second variant of the model takes care of the technical aspect of unit roots and hence requires us to estimate the model in first differences. The third variant of the model is a more detailed model where we incorporate the various components of procurement incidentals and distribution costs in order to ascertain which specific components are impacting food subsidy.

The base model being estimated is:

$$FSUB_t = a_0 + a_1 PROC_t + a_2 MSP_T + a_3 PI_t + a_4 DC_t + a_5 CIP_t + a_6 Dummy + u_t \quad (1)$$

Where,

FSUB_t = Total Food subsidy (Rs crore) at current prices in year t.

PROC_t = Procurement Volume (million tonnes).

¹ A new accounting practice of including weightage of levy rice in the procurement incidentals was introduced from 2006-07 onwards.

MSP_t = weighted average of Minimum Support Prices of paddy and wheat (Rs per quintal) based on procurement volumes. Since paddy is a kharif crop, and is harvested in the months of October–December, the support prices of the same year has been considered. Wheat however is a rabi crop and harvested in February–May. Hence the support prices of the earlier crop year have been included.

PI_t = weighted average of procurement incidentals of wheat and rice ((Rs per quintal) based on procurement volumes

DC_t = weighted average of distribution costs of wheat and rice (Rs per quintal) based on procurement volumes

CIP_t = weighted average of Central Issue Price of Rice and wheat (Rs per quintal)

The above variables are as suggested by Sharma (2012). We have, however, chosen to include the following dummy variable

DUMMY =1 from 2006-07 onwards to 2014-15 and zero otherwise.

The dummy variable was introduced to reflect the sharp increase in Procurement Incidentals from 2006-07 onwards due to the new accounting practice of including weightage of levy rice in the procurement incidentals from 2006-07 onwards.

The regression was estimated by Ordinary Least Squares (OLS) and the estimates are reported in the table 1 below.

The finding of our base model (Model I) corroborates the major finding of Sharma (2012) viz., procurement price (or Minimum Support Price, MSP) has a significant role to play in determining food subsidy. The other major finding of ours, which also finds resonance in Sharma's model is that distribution costs (DC), which are largely within the purview of FCI continues to be statistically insignificant. Unlike Sharma, our model, however, suggests that procurement incidentals (PI) are statistically significant in determining food subsidy. Procurement incidentals include (i) statutory costs which cover mandi charges, gunny costs and sales tax and (ii) labour and transport costs and (iii) charges paid to the State which include interest paid to state agencies, custody and maintenance charges and administrative charges paid to States. However, like procurement price these payments too are determined by the Central government and not under the purview of FCI, hence it would appear that it is not the FCI *per se* which is responsible for the mounting food subsidy bill, but the Central government policies relating to procurement. The Central Issue Price (CIP) is seen to be negative and

statistically significant thus implying that raising the CIP would help bring food subsidies under check, but this too is outside the domain of the FCI and the prerogative of the central government. Thus the message which clearly surfaces from our model is that it is Central government policies, more than the FCI *per se*, that need to be addressed on a priority basis if the food subsidy bill is to be brought under check.

On the regression diagnostics we find that the model shows high goodness of fit with the adjusted $R^2 = 0.989$ and the probability $>F$ as 0.000. To check autocorrelation, both Durbin Watson d statistic and the Breusch -Godfrey LM test was conducted. The d statistic value was 1.82 and since it is between the lower and upper critical values of 0.804 and 2.061 respectively, no conclusion can be made regarding the presence of autocorrelation. However, the LM Test showed that the null hypothesis of zero autocorrelation cannot be rejected. The Breusch- Pagan test shows absence of heteroscedasticity as the null hypothesis of constant variance could not be rejected.

Following Sharma (2012), we also ranked the coefficients based on the standardised coefficients based on absolute values (Table 1). The standardised coefficients are measured in standard deviations, instead of units of the concerned variable, and thus they are comparable. Considering only absolute values, we see that MSP has the highest importance followed by CIP and PI. The PROC and DC are lower in ranking and not significant in the estimation. These results justify our claim that the acquisition costs of FCI which include the procurement prices as well as procurement incidentals are responsible for a high economic costs and since Central Issue Prices have hardly changed in the past years, the burden of subsidy on the financial exchequer continues to rise.

A modification which we considered for the above model was to test for unit roots and consider the variables in their stationary form. We used the Phillips Perron (1988) test for testing the presence of unit roots and observed the log transformation of the variables to be I(1). The details of unit root tests are seen in the Table 2 below.

Hence the model was re-estimated (Model II) with the variables in first difference of the log form, which were all stationary, as specified in (2) below:

$$\Delta LFSUB_t = A + a_1 \Delta LProc_t + a_2 \Delta LMSP_T + a_3 \Delta LPI_t + a_4 \Delta LDI_t + a_5 \Delta LCIP_t + a_6 \text{Dummy} + u_t \quad (2)$$

The results of the estimation are shown in the Table 3 below.

Model II where the variables are stationary form also shows that only MSP and CIP significantly affect food subsidy. Thus the findings of Sharma (2012) and our estimation in Model I is further vindicated in Model II, i.e. food subsidies have increased primarily due to factors which are determined by the Central government and not on account of FCI's own policies.

TABLE 1 - *Factors Affecting Food Subsidy (Model I)*

Independent Variables	Dependent Variable FSUB		
	Coefficients	Standardised Coefficients	Rank ^(b)
MSP	66.72*** (0.004)	.699	1
PROC	92.05 (0.66)	0.044	4
PI	124.66*** (0.005)	0.456	2
DC	5.65 (0.727)	.015	5
CIP	-50.32*** (0.001)	-.105	3
DUMMY	-14354.7*** (0.00)	-0.219	-
Intercept	-8176.8 (0.16)	-	
<i>R²(Adj)</i>	<i>0.989</i>		
<i>F</i>	<i>362.13</i>		
<i>Prob>F</i>	<i>0.000</i>		
<i>Durbin Watson</i>	<i>1.82</i>		
<i>LM Test (Prob>chi2)</i>	<i>0.71</i>		
<i>Breusch Pagan Test (Prob>Chi2)</i>	<i>0.91</i>		
<i>Notes:</i>			
(a) Figures in parentheses are p values			
(b) Rankings on basis of standardised coefficients (beta)			
Standardised coefficient =estimated coefficient multiplied by (standard deviation of the predictor variable/ standard deviation of the dependent variable)			
(c) *** denotes significance of 1%			

TABLE 2 - Unit Root Test

Variable	Description	Units	Test Statistic		Unit root (Phillips Perron)
			Level	First Diff.	
LFSUB	Total Food Subsidy	Rs crores	-0.73 (0.788)	-22.39*** (0.00)	I(1)
LPROC	Total procurement	Million Tonnes	-1.9 (0.653)	-19.76*** (0.000)	I(1)
LMSP	Minimum support prices	Rs per qtl	-0.41 (0.878)	-12.51** (0.047)	I(1)
LPI	Procurement incidentals	Rs per qtl	-0.14 (0.951)	-31.41*** (0.000)	I(1)
LDI	Distribution cost	Rs per qtl	-1.43 (0.882)	-15.00** (0.017)	I(1)
LCIP	Central Issue Prices	Rs per qtl	-8.79 (0.029)	-19.95*** (0.002)	I(1)

Notes:
 (a) All variables are log transformed
 (b) *** denotes significance of 1% and ** significance at 5%
 (c) Z(rho) Test statistic is considered
 (d) MacKinnon approximate p-value for z(t) are given in parenthesis
 (e) 5% Critical value is -12.5 and 1% critical value is -17.2

On the regression diagnostics front our model shows no autocorrelation or heteroscedasticity as seen by the LM test and the Breusch Pagan Test.

To further the analysis, we estimated yet another variant viz., Model III where we considered the components of the procurement incidentals and distribution costs so as to zero in some specific component of procurement incidentals or distribution costs which may be impacting food subsidies. Procurement incidentals include (i) statutory costs which cover mandi charges, gunny costs and sales tax (ii) labour and transport costs which include mandi labour, forwarding charges and internal movement and (iii) the charges paid to the State which include interest paid to state agencies, custody and maintenance charges and administrative charges paid to States. The distribution costs include (i) freight (ii) storage (iii) handling (iv) interest and (v) establishment charges. The distribution costs also include the (vi) storage and transit losses. The list of the variables and the results from Phillips-Perron test for unit roots is given in Table 4 below.

TABLE 3 - Regression Results (Model II)

Dependent Variable Δ LFSUB			
Independent Variables	Coefficients	Standardized Coefficients	Rank ^(c)
Δ LMSP	2.2655*** (0.009)	0.73	1
Δ LPROC	-0.47 (0.145)	-0.397	3
Δ LPI	-0.16 (0.34)	-0.211	5
Δ LDI	-0.29 (0.22)	-0.279	4
Δ LCIP	-0.66* (0.07)	-0.399	2
DUMMY	-.078 (-0.33)	0.225	-
Intercept	0.101 (0.13)		
R^2 (Adj)	0.47		
F	2.23		
Prob>F	0.09		
Durbin Watson	1.86		
LM Test (Prob>chi2)	0.45		
Breusch Pagan Test (Prob>Chi2)	0.31		
<p>Notes:</p> <p>(a) Figures in parentheses are p values</p> <p>(b) All variables are log transformed and the regression is estimated with first difference of log variables</p> <p>(c) Ranked on basis of standardised coefficients (beta). Standardised coefficient =estimated coefficient multiplied by (standard deviation of the predictor variable/ standard deviation of the dependent variable)</p> <p>(d) *** denotes significance of 1% ** significance at 5% and * significance at 10%</p>			

TABLE 4 - Unit Root Tests

Variable	Description	Units	Test Statistic		Unit Root (Phillips Perron)
			Level	First Difference	
LFSUB	Total subsidy	Rs crores	-0.73 (0.788)	-22.39*** (0.00)	I(1)
LPROC	Total procurement	Million Tonnes	-1.89 (0.653)	-19.76*** (0.000)	I(1)
LMSP	Minimum support prices	Rs per qtl	-0.41 (0.878)	-12.51** (0.0475)	I(1)
LSTAT	Statutory Costs	Rs per qtl	-0.51 (0.922)	-18.66*** (0.001)	I(1)
LLABTRANSP	Labour & transport Charges	Rs per qtl	-0.14 (0.951)	-21.55*** (0.003)	I(1)
LSTATETOT	Charges paid to State	Rs per qtl	-0.04 (0.957)	-17.07** (0.001)	I(1)
LFREIGHT	Freight charges	Rs per qtl	-3.64 (0.684)	-19.16*** (0.000)	I(1)
LHANDLING	Handling charges	Rs per qtl	-0.65 (0.890)	-19.107*** (0.001)	I(1)
LSTORAGE	Storage charges	Rs per qtl	-1.84 (0.827)	-18.09*** (0.001)	I(1)
LINTEREST	Interest costs	Rs per qtl	-6.41 (0.518)	-18.08*** (0.002)	I(1)
LESTBMT	Establishment Charges	Rs per qtl	-3.76 (0.625)	-26.79*** (0.000)	I(1)
LTRANSIT	Transit shortages	Rs per qtl	-4.81 (0.624)	-10.39 * (0.110)	I(1)
LSTORSHRT	Storage shortages	Rs per qtl	-21.88*** (0.002)	-	I(0)
LCIP	Central Issue Prices	Rs per qtl	-8.79 (0.029)	-19.95*** (0.002)	I(1)

Notes:

(a) All variables are log transformed

(b) *** denotes significance of 1%, ** significance at 5% and * significance at 10%

(c) Z(rho) Test statistic is considered

(d) MacKinnon approximate p-value for z(t) are given in parenthesis

(e) 10% Critical Value is -10.2, 5% Critical value is -12.5 and 1% critical value is -17.2

The Phillips Perron test showed that the log transformed variables are I(1) except the storage losses. For the purpose of our analysis we are considering the cost elements only and not the losses. The equation estimated (Model III) is:

$$\begin{aligned} \Delta\text{LFSUB}_t = & A + a1\Delta\text{LPROC}_t + a2\Delta\text{LMSP}_t + a3\Delta\text{LSTAT}_t + a4\Delta\text{LSTATETOT}_t + a5\Delta\text{LLABTRANSP}_t + \\ & a6\Delta\text{LFREIGHT}_t + a7\Delta\text{LHANDLING}_t + a8\Delta\text{LINTEREST}_t + a9\Delta\text{LSTORAGE}_t + \\ & a10\Delta\text{LESTABLISHMENT}_t + a11\Delta\text{LCIP}_t + a12\text{DUMMY} + u_t \end{aligned} \quad (3)$$

The above results once again show that growth of MSP and CIP are the only two significant factors behind the growth of food subsidy. While ranking the variables, the MSP once again emerges as having the first rank.

The Breusch-Pagan test showed absence of heteroscedasticity as the null hypothesis of constant variance could not be rejected. There is no autocorrelation as seen by the LM test results.

All three variants of our model point to the fact that it is policies of the Central government pertaining to procurement price and Central Issue Price which affects the food subsidy bill. In Model I, where the unit root test of the variables were not performed and estimation was done with variables in level terms, procurement incidentals too showed up as a significant variable. However, these procurement incidentals are also largely out of the purview of FCI. None of the variants of our model show distribution costs, which is the only component of economic cost, largely under purview of FCI, to be the major factor behind the increasing food subsidy bill.

Although our models clearly point to the fact that it is not the FCI *per se* but Central government policies related to procurement and Central Issue Price which are solely responsible for the rising food subsidy, we thought it would be interesting to look at the trend pattern of the cost components so as to assess the performance of this parastatal itself over time. Such an analysis would also allow us to check the robustness of the results obtained from the three variants of the model which we have estimated. It is to this that we turn in Section 4 below.

TABLE 5 - Regression Results (Model III)

Independent Variables	Dependent Variable Δ LFSUB		
	Coefficients	Standardised Coefficients	Rank ^(c)
Δ LMSP	2.63** (0.04)	0.85	1
Δ LPROC	-0.64 (0.20)	-0.54	2
Δ LSTAT	-0.40 (0.53)	-0.51	3
Δ LLABTRANSP	0.39 (0.59)	0.336	6
Δ LSTATETOT	0.25 (0.34)	-0.396	5
Δ LFREIGHT	0.04 (0.85)	0.057	10
Δ LHANDLING	-0.31 (0.65)	-0.253	7
Δ LINTEREST	0.002 (0.98)	0.005	11
Δ LSTORAGE	-0.06 (0.91)	-0.07	9
Δ LESTBMT	-0.09 (0.75)	-0.122	8
Δ LCIP	-0.795* (-0.08)	-0.48	4
DUMMY	-0.05 (0.54)		
Intercept	0.11 (0.35)		
R^2	0.65		
F	1.42		
$Prob > F$	0.30		
<i>Durbin Watson</i>	2.19		
<i>LM Test (Prob > chi2)</i>	0.18		
<i>Breusch Pagan Test (Prob > Chi2)</i>	0.39		
<p>Notes:</p> <p>(a) Figures in parenthesis are p values</p> <p>(b) All variables are log transformed and the regression is estimated with difference of log variables</p> <p>(c) Ranked on basis of standardised coefficients (beta). Standardised coefficient = estimated coefficient multiplied by (standard deviation of the predictor variable/ standard deviation of the dependent variable)</p> <p>(d) ** denotes significance of 5% , * denotes significance at 10%</p>			

4. ANALYSING THE COSTS COMPONENTS OF THE FCI

In this section we further the analysis undertaken by Swaminathan (1999) who analysed these costs for the period 1990-91 to 1998-99. Our study extends the analysis to 2014-15 and for the purpose of analysis we divide the sample into two periods: period I which has been studied by Swaminathan which extends from 1990-91 to 1998-99 and period II, the extended period, which stretches from 1999-2000 to 2014-15.

Table 6 tabulates economic costs, sales realization and subsidy per quintal in real terms and Figures 2 to 4 trace the trend pattern of these variables. The economic costs of FCI (per quintal in real terms) for wheat and rice show an increasing trend as seen in Table 6. The average economic cost (in real terms per quintal) has risen from Rs. 973.4 in period I to Rs. 1054.26 in period II for wheat and from Rs. 1226.9 to Rs. 1362.85 for rice. The increase in economic costs could be due to increase in the procurement prices also known as the pooled cost of grain and/or due to increase in distribution costs.

The trend in per quintal real economic costs is seen in Figure 2 below.

FIGURE 2 - *Economic Cost Per Quintal in Real Terms*

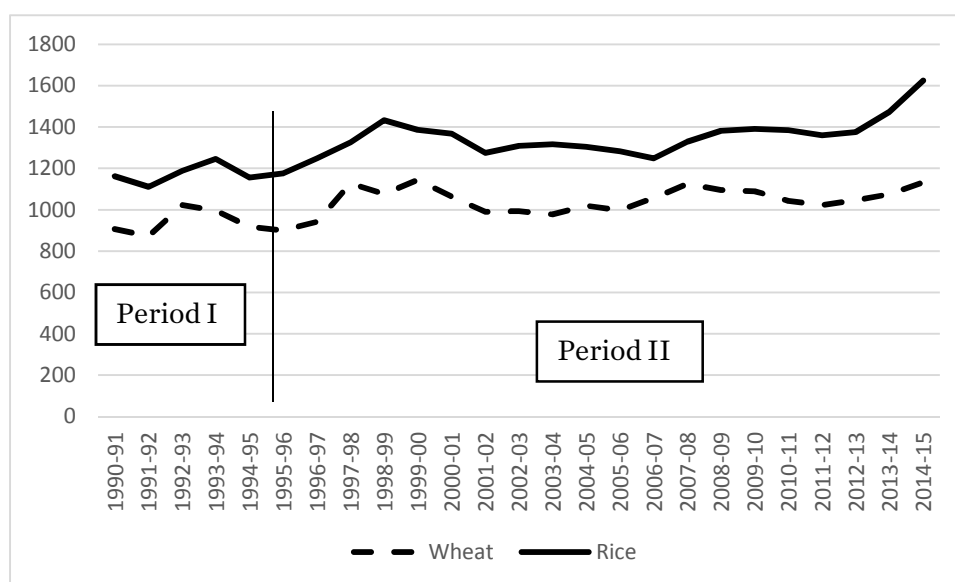


TABLE 6 - Economic Subsidy on Rice and Wheat (in Real terms) (Rs per Qtl)

Year	Eco Cost	Sales Realizn	Subsidy	Eco Cost	Sales Realizn	Subsidy
	(1)	(2)	(3) = (2) - (1)	(1)	(2)	(3) = (2) - (1)
	Wheat			Rice		
Period I						
1990-91	905.65	608.43	296.08	1162.29	838.38	323.90
1991-92	872.85	562.10	310.75	1110.16	816.54	293.62
1992-93	1023.04	566.94	456.10	1187.77	897.82	289.95
1993-94	996.49	666.56	329.93	1245.73	937.29	308.45
1994-95	916.82	678.49	238.33	1155.59	999.31	156.28
1995-96	899.46	634.51	264.95	1174.97	944.73	230.24
1996-97	942.63	637.88	304.75	1248.21	899.05	349.16
1997-98	1128.31	558.52	569.80	1325.77	860.34	465.43
1998-99	1075.61	516.51	559.10	1432.37	800.05	632.32
Average	973.43	603.33	369.98	1226.98	888.17	338.82
Growth rate (%)	1.98	-0.8	5.6	2.35	-0.03	6.89
Period II						
1999-00	1144.05	777.96	366.09	1385.48	954.48	431.00
2000-01	1062.79	588.44	474.35	1367.84	859.43	508.42
2001-02	990.43	595.59	394.84	1274.94	728.87	546.07
2002-03	992.65	603.89	388.76	1308.21	782.85	525.36
2003-04	978.23	607.39	370.84	1316.20	816.00	500.20
2004-05	1019.01	555.38	463.63	1303.59	728.04	575.55
2005-06	996.99	525.85	471.14	1282.00	662.90	619.10
2006-07	1057.25	409.16	648.10	1248.82	576.91	671.90
2007-08	1125.00	392.30	732.70	1329.21	523.83	805.38
2008-09	1095.70	414.52	681.18	1381.53	470.56	910.98
2009-10	1089.15	447.52	641.64	1391.49	505.84	885.65
2010-11	1042.81	385.04	657.77	1383.89	427.07	956.82
2011-12	1021.94	342.08	679.87	1359.99	370.05	989.94
2012-13	1045.69	481.66	564.03	1375.22	351.02	1024.20
2013-14	1074.50	466.68	607.82	1472.70	339.87	1132.83
2014-15	1132.03	348.72	783.31	1624.49	304.64	1319.85
Average	1054.26	496.38	557.88	1362.85	587.65	775.20
Growth Rate (%)	0.28	-4.04	4.47	0.8	-7.56	7.03
<p>Source: Calculated using data taken from http://fciweb.nic.in</p> <p>Notes:</p> <p>(a) Data from 2006-07 for rice includes incidentals of levy rice</p> <p>(b) Data has been converted to real terms using WPI with base 2004-05</p> <p>(c) Growth rate is obtained by estimating a semi logarithmic regression of the variable over time ($\ln Y = a + bt$)</p>						

Figure 3 below graphs the sales realisation (per quintal in real terms). The average has fallen for wheat from Rs. 603 in period I to Rs. 496 in period II and for rice from Rs. 603 in period I to Rs. 496 in period II and for rice from Rs. 888 to Rs. 587. The growth rate was negative for both rice and wheat in periods I and II with a greater reduction in period II for both (see Table 6).

FIGURE 3 - Sales Realisation Per Quintal in Real Terms

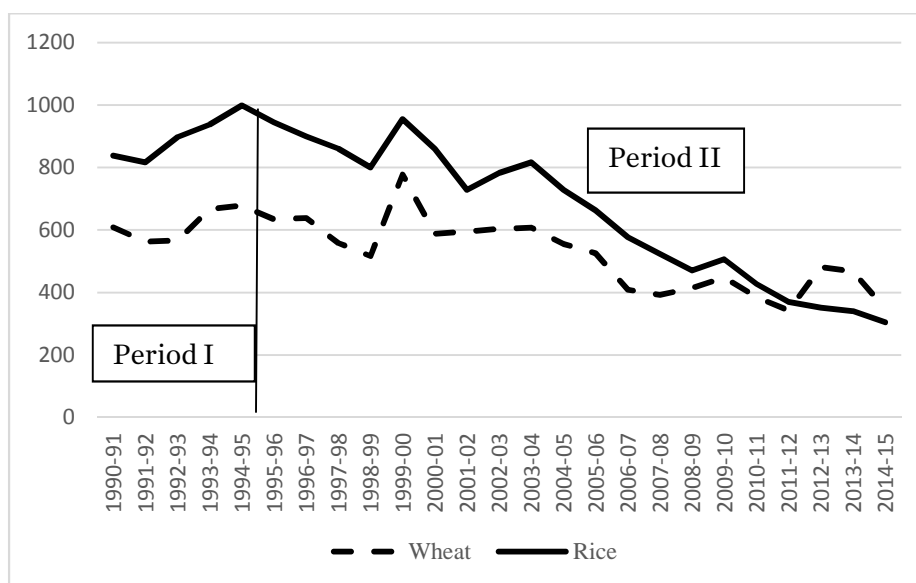
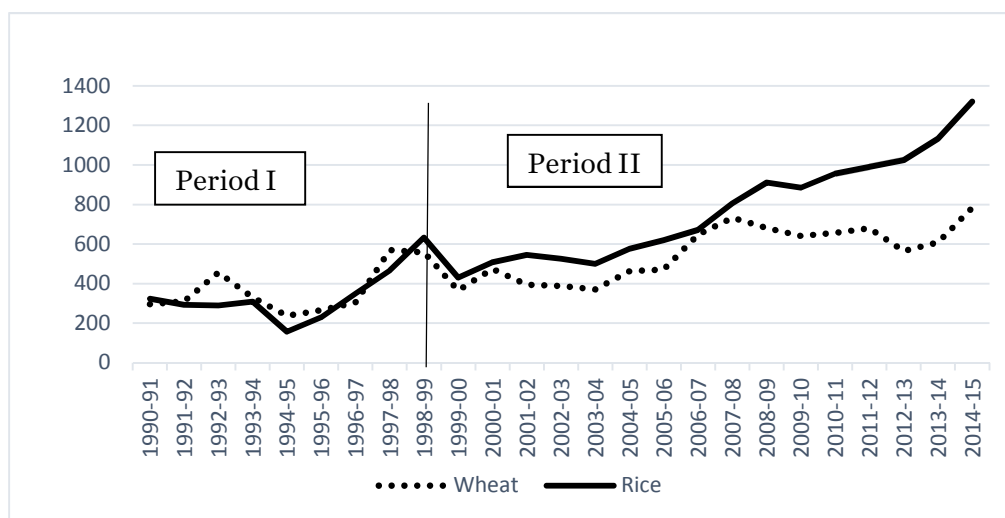


Figure 4 below graphs the gap between economic cost and sales realization i.e. the subsidy. The average subsidy (per quintal in real terms) for wheat has risen from Rs.369.9 in period I to Rs. 557.8 in period II. For rice it has risen from Rs. 338.8 in period I to Rs. 775.2 in period II (see Table 6). The growth rate (as calculated by estimating a semi logarithmic regression over time) for wheat shows a fall from 5.6% in period I to 4.47% in period II. For rice it has increased from 6.89% in period I to 7% in period II. However, the numbers for rice are not strictly comparable over periods I and II as there has been a definitional change with levy rice being included from 2006-07.

FIGURE 4 - Subsidy Per Quintal in Real Terms



Thus, increasing economic costs and falling sales realization, both put together have resulted in increasing subsidies.

We now turn our attention to the two components of economic costs of FCI viz., the acquisition costs and distribution cost. Broadly, acquisition costs constitute pooled cost (i.e. procurement costs of FCI), which is determined by the Central government and procurement incidentals. The share of acquisition costs and distribution costs in economic costs incurred by FCI for wheat and rice are seen in Table 7 below.

Table 7 shows that on an average acquisition costs constitute about 78% of total costs and distribution costs about 20.7% for wheat in period I and 81.8 % and 18% for rice in period I. Of the acquisition costs, pooled costs constitute over 59.9% for wheat and over 75% for rice. These pooled costs are procurement costs which are based on procurement prices, which are completely outside of the purview of FCI and directly under the control of the Central government. In period II, the acquisition costs constitute 81.8 % of total costs for wheat and 84.46% for rice. The distribution costs on the other hand comprise 17.8% and 15% for wheat and rice respectively. Of the acquisition costs, pooled costs comprise 66.3% and 73.2% for wheat and rice respectively. Hence, broadly speaking the FCI has within its purview only 15-17% of economic costs incurred on distribution.

TABLE 7- Acquisition and Distribution Costs as Per Cent of Economic Costs (in %)

Wheat					Rice			
Year	Acqn Costs	Pooled Cost	Proc. Incident al	Distn Costs	Acqn Costs	Pooled Cost	Proc Incident al	Distn Costs
	(1) = (2)+(3)	(2)	(3)	(4)	(5) = (6)+(7)	(6)	(7)	(8)
Period I								
1990-91	78.68	60.31	18.37	21.04	80.81	74.77	6.03	19.19
1991-92	71.96	54.04	17.91	23.03	83.48	78.65	4.83	16.70
1992-93	76.19	58.62	17.57	23.81	79.49	74.11	5.39	20.54
1993-94	77.93	61.15	16.78	22.07	81.29	75.24	6.05	18.72
1994-95	80.78	60.69	20.09	19.12	85.78	77.41	8.37	14.22
1995-96	80.72	60.11	20.60	19.28	83.31	76.21	7.09	16.69
1996-97	82.13	56.66	25.47	17.87	81.12	73.26	7.86	18.88
1997-98	78.92	62.47	16.46	21.08	80.62	74.83	5.79	19.38
1998-99	80.09	65.88	14.21	19.91	80.75	75.12	5.63	19.25
Average (Geometric Mean)	78.55	59.91	18.38	20.72	81.83	75.49	6.24	18.08
Period II								
1999-00	77.24	58.37	18.87	22.76	82.55	77.34	5.22	17.45
2000-01	83.49	67.66	15.83	16.51	85.90	78.82	7.08	14.10
2001-02	85.15	69.36	15.79	14.84	89.11	83.02	6.08	10.89
2002-03	83.54	67.97	15.57	16.46	86.46	81.17	5.29	13.54
2003-04	81.53	66.49	15.04	18.47	82.65	80.16	2.48	17.35
2004-05	78.14	60.20	17.93	21.86	80.32	75.84	4.49	19.68
2005-06	77.49	61.06	16.43	22.51	79.67	76.75	2.92	20.33
2006-07	77.13	61.83	15.30	22.87	79.18	65.26	13.92	20.82
2007-08	81.37	68.86	12.50	18.63	80.78	66.92	13.87	19.22
2008-09	82.22	69.21	13.01	17.78	83.87	70.84	13.03	16.13
2009-10	85.94	71.41	14.52	14.06	89.84	73.98	15.86	10.16
2010-11	85.44	71.22	14.21	14.56	88.73	72.94	15.79	11.27
2011-12	84.93	70.16	14.77	15.07	87.72	71.23	16.49	12.28
2012-13	84.60	69.58	15.03	15.40	87.54	70.89	16.65	12.46
2013-14	81.62	66.61	15.01	18.38	85.09	67.37	17.72	14.91
2014-15	81.14	64.25	16.90	18.86	83.10	62.90	20.20	16.90
Average (Geometric Mean)	81.88	66.39	15.34	17.83	84.46	73.23	9.14	15.08

Table 8 below tabulates the growth rate of the major components of economic costs. The growth rate, as earlier, has been obtained by estimating a semi logarithmic regression. We find that procurement prices or pooled cost is the fastest growing component of economic cost. It has increased faster for wheat than rice in both periods I and II. However, the growth rate of procurement prices for both rice and wheat were slower in period II compared to period I. This component of economic cost is clearly outside the purview of the FCI.

Procurement incidentals are also by and large outside the purview of FCI. We find that the growth rate of procurement incidentals as a whole has fallen from 8.5 % to 6.2% for wheat in periods I and II. For rice, however, this growth rate has increased sharply from around 8.8% in period I to 18% in period II. As stated earlier, however, due to the inclusion of levy rice in period II, the numbers of period II are not strictly comparable with period I for rice.

By and large FCI has control over distribution costs. However, even here not all components are within the purview of the FCI, but we will address this aspect a bit a later. The growth rate of distribution costs as a whole was marginally lower in period II than in period I for wheat (6.01% in period I and 5.24% in period II) and for rice (9.5% in period I and 5.7% in period II), which would seem to suggest that the FCI's overall efficiency in this respect has improved in case of wheat and rice. However, here we are considering distribution costs as a whole (Table 8). Greater insight into this would be evident when we analyse sub-components of procurement incidentals and distribution costs.

4.1 Sub-Components of Procurement Incidentals

We now turn to analysing specific sub-components of procurement incidentals (Table 9). A major part of procurement incidentals are statutory charges which include the mandi charges, Arthiya charges, gunny costs, sales tax and milling and driage charges. These are decided by the Government and are not under the direct control of FCI. The additional charges shown in the Table 9 include administration charges and guarantee fees which are not under the control of FCI. Table 9 below shows the percentage share of each of these components for the two periods under discussion. As we are evaluating cost shares, we compute the geometric mean to compute period average for each of the variables.

TABLE 8 - Growth Rate of the Components of Economic Costs (%)

	Wheat	Rice
Period I		
Procurement Price of grain	9.6	8.8
Total Procurement Incidentals	8.5	8.82
Total Distribution Costs	6.01	9.47
Period II:		
Procurement Price of grain	6.7	5.26
Total Procurement Incidentals	6.27	17.96
Total Distribution costs	5.24	5.68
<i>Source:</i> Calculated from FCI Annual Reports at: < http://fci.gov.in/finances.php?view=5 > <i>Notes:</i> (a) For rice, procurement incidentals from 2006-07 include levy rice incidentals (b) Growth rate has been calculated using semi logarithmic regression ($\ln Y = a + bt$)		

We find statutory charges are the most important component of procurement incidentals constituting on an average more than 56% for wheat and 65% for rice in period I. In period II, its share has increased sharply for both and reached an average of 71% for wheat and 73% for rice. The average share of labour and transport charges in both periods has remained more or less constant for wheat at around 13%. In case of rice, its share has fallen from 15.9% in period I to 8.6% in period II. The share of all other components viz, storage and interest charges and additional charges, have shown a reduction in period II for both wheat and rice. An important observation we can make at this juncture is that apart from the pooled cost, statutory costs too are a component of procurement incidentals over which once again the FCI has little control.. Hence any reduction in expenditure on procurement incidentals requires that these statutory costs imposed by the government be reduced.

4.2 Sub-Components of Distribution Costs

We now turn our attention to sub-components of distribution costs incurred by FCI in Table 10 below. It is only this component of economic cost which is by and large within the domain of FCI and for which the FCI can be held responsible. In the early 1990s the distribution costs reported were combined for rice and wheat (Annual Reports of FCI). Since 1993-94 they were reported separately for rice and wheat. However, once again from 1999-00 onwards, the components of distribution costs were reported jointly for rice and wheat. Table 10 below shows that share of various components of distribution costs for the two periods.

TABLE 9 - Percentage Share of Sub-Components of Total Procurement Incidental Costs (%)

Year	Statutory Charge	Labour & Transport Charges	Storage & Interest Charges	Addl. Charges	Total Charges to State Govts	Statutory Charge	Labour & Transp Charge	Storage & Interest Charge	Addl. Charge	Total Charges to State Govts
Period I										
Wheat					Rice					
1990-91	56.81	13.16	20.84	9.19	30.04	71.96	15.85	4.38	7.81	12.19
1991-92	47.16	13.47	20.20	19.16	39.36	68.37	16.37	4.77	10.5	15.26
1992-93	49.53	16.37	25.49	7.82	33.31	67.30	17.79	7.36	7.5	14.91
1993-94	56.91	15.48	20.95	6.41	27.35	70.53	16.45	6.41	6.6	13.02
1994-95	57.72	12.51	21.18	6.55	27.72	57.29	14.30	6.64	21.8	28.42
1995-96	58.97	12.43	20.71	7.18	27.89	67.23	14.64	8.00	10.1	18.13
1996-97	59.03	13.20	19.85	7.56	27.41	58.59	13.61	6.71	21.1	27.80
1997-98	61.16	11.87	18.50	7.06	25.55	63.68	16.76	7.22	12.4	19.56
1998-99	58.65	11.92	22.23	5.99	28.22	62.73	17.94	7.21	12.1	19.33
Average (Geometric mean)	56.03	13.30	21.03	7.99	29.41	65.12	15.90	6.41	11.23	17.97
Period II										
Wheat					Rice					
1999-00	67.38	13.81	9.41	8.77	17.89	77.12	15.72	0.43	4.23	4.66
2000-01	69.04	13.76	7.01	8.92	15.70	75.89	14.68	0.07	4.21	4.28
2001-02	68.64	14.72	6.96	8.92	15.88	76.47	14.39	0.02	4.14	4.17
2002-03	68.21	14.02	8.15	9.85	18.00	85.39	12.14	0.00	2.63	2.63
2003-04	68.05	11.95	9.09	9.90	18.99	73.42	17.92	0.00	3.97	3.97
2004-05	58.13	11.35	3.39	7.85	11.23	22.12	6.62	0.00	1.84	1.84
2005-06	68.45	14.04	1.80	8.67	10.48	83.29	9.58	0.00	2.44	2.44
2006-07	68.17	13.56	1.65	8.53	10.18	83.57	8.36	6.44	0.81	7.19
2007-08	79.91	15.70	2.30	5.53	7.83	80.45	7.87	6.79	4.32	11.06
2008-09	76.00	14.88	3.09	5.94	9.03	76.47	7.79	6.31	4.63	10.59
2009-10	79.43	13.19	3.00	4.34	7.34	81.04	6.64	6.62	5.63	12.24
2010-11	77.15	14.82	2.71	5.91	8.62	81.40	6.00	6.19	4.97	11.05
2011-12	76.60	14.78	2.35	6.52	8.86	81.16	6.01	6.48	5.71	12.15
2012-13	71.68	13.48	6.06	7.62	13.69	81.20	5.53	7.95	6.69	14.77
2013-14	72.03	13.07	6.30	5.88	12.18	79.82	4.89	7.92	7.42	15.34
2014-15	70.86	10.17	5.09	5.85	10.94	71.71	6.16	7.40	5.97	12.62
Average (Geometric mean)	71.02	13.51	4.19	7.24	11.75	73.08	8.62	-	3.88	6.67
<i>Notes:</i>										
(a) ** In 2004-05, arrears relating to previous years were very high thus increasing procurement incidentals significantly. Calculated from FCI Annual Reports At: < http://fci.gov.in/finances.php?view=5 >										

TABLE 10 - Share of various Components of Total Distribution Costs (in %)

Year	Freight	Handling	Storage Charge	Interest	Transit shortage	Storage shortage	Transit & storage shortages	Estab. charge
Rice and Wheat								
1990-91	41.24	9.57	7.84	23.88	7.04	1.22	8.26	9.2
1991-92	31.94	10.4	8.5	31.88	7.29	1.94	9.23	8.05
1992-93	26.86	9.31	10.44	33.29	6.61	1.85	8.46	11.65
Wheat								
1993-94	42.76	9.11	6.91	28.15	4.28	-0.54	3.75	9.32
1994-95	44.95	11.03	7.53	23.91	4.2	-0.35	3.85	8.73
1995-96	39.26	12.58	9.74	23.87	4.11	-0.29	3.82	10.72
1996-97	38.3	15.01	9.94	21.71	4.91	-0.31	4.6	10.44
1997-98	37.93	15.66	9.96	23.63	3.06	-0.35	2.7	10.11
1998-99	39.92	15.09	10.47	21.81	2.74	-0.26	2.43	10.28
Rice								
1993-94	33.6	8.59	6.48	34.52	5.42	2.6	8.01	8.79
1994-95	29.25	11.78	8.04	34.18	4.99	2.45	7.44	9.32
1995-96	33.49	11.13	8.61	28.18	5.78	3.33	9.11	9.48
1996-97	35.26	11.51	9.13	26.66	5.81	3.63	9.44	8
1997-98	35.2	14.51	9.29	26.33	3.27	2.01	5.28	9.39
1998-99	36.24	13.67	9.46	26.08	3.32	1.97	5.29	9.27
Wheat and Rice								
1999-00	38.0	14.7	7.7	24.6	5.3	1.3	6.6	8.4
2000-01	33.1	15.1	7.0	30.8	3.7	0.9	4.7	9.2
2001-02	27.8	16.9	10.0	33.7	1.4	0.6	2.0	9.6
2002-03	30.7	14.9	11	33.8	0.6	1.6	2.2	7.4
2003-04	35.2	15	12.5	27.2	0.7	2	2.7	7.4
2004-05	32.1	15.6	13.7	29.3	-0.3	1.2	0.9	8.3
2005-06	31.7	14.8	11.7	32.6	1.1	1.1	2.2	6.9
2006-07	31.1	14	10.6	34.5	0.8	1	1.9	8
2007-08	33.8	14.2	10	31.6	0.7	1.1	1.8	8.2
2008-09	26.4	19.6	12.4	27.6	0.9	0	1	13.1
2009-10	37.3	22.4	12.8	13.5	1.6	0.7	2.3	12.1
2010-11	34.3	21.2	13.1	16.5	1.8	1.1	2.9	12
2011-12	31.5	19.5	11.4	25.7	2.1	0.1	2.2	9.6

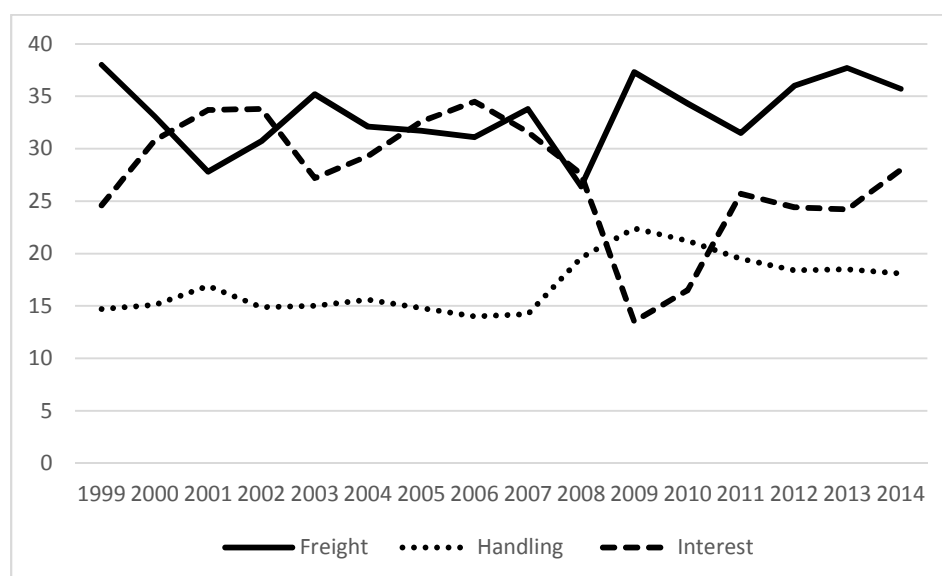
TABLE 10 - continued

Wheat and Rice								
2012-13	36	18.4	10.4	24.4	1.8	1	2.8	8
2013-14	37.7	18.5	8.5	24.2	2.3	0.7	3	8.1
2014-15	35.7	18.1	9.4	28	1.9	1	3	5.8
Average (Geometric Mean)	33.11	16.87	10.58	26.63	-	-	2.36	8.68
Grth rate	0.57	2.08	0.93	-2.2	-0.1	-0.5	-0.16	0.05

Source: Computed from data provided in Annual Reports of FCI, various issues
Notes:
 (a) '-' geometric mean could not be computed on account of negative numbers
 (b) Growth rate is computed by estimating a semi logarithmic regression ($\ln Y=a+bt$)

To begin with we look at the share of freight charges, interest costs and handling charges of FCI. Strictly speaking these costs are not directly under the purview of FCI. Any improvement on this front would require the Government of India to take the lead.

FIGURE 5 - Share of Freight Charges, Handling Charges and Interest in Distribution Costs of FCI



For the period 1999-00 to 2014-15 where the distribution costs are reported jointly for rice and wheat we find that freight charges constitute as much as 33% of total distribution costs. While it is true that freight rates (primarily railways) is beyond the control of FCI, freight charges depend

on the volume of grains too. In this context it is believed that the FCI could plan its movement of grains better through zonal procurement and distribution (Murthy and Ramanayya, 2007). In fact the Board of Industrial Costs and Prices (BICP) had pointed out that at times grains procured are less than grains transported indicating that old stocks are moved second or third time leading to increase in costs (BICP, 1991).

The increase in interest costs is largely because of pending arrears with the government. Because of delays in disbursal from the Central Government, FCI has no option but to borrow from the market to fund operations (Bakshi, 2015). Thus, the blame for rising interest cost does not lie entirely at the door step of the FCI.

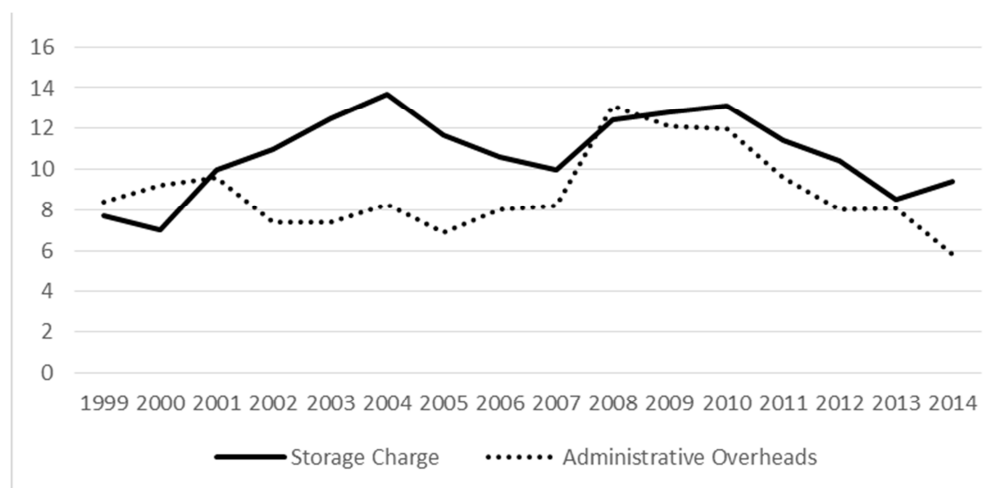
Handling charges constitute about 17% of the distribution costs and have recorded a growth rate of 7.18%. These refer to the costs that the FCI incurs in the handling of grains at mandis, ports and rail depots. They mostly comprise of labour charges. The handling charges during procurement are included under procurement incidentals under the mandi labour etc. (Gulati *et al.*, 1996). A Departmental worker (loader) costs FCI about Rs 79,500 per month (April-Nov 2014 data) *vis-à-vis* Direct Payment System (DPS) worker at Rs 26,000 per month and contract labour costs about Rs. 10,000 per month. The Commission for Agricultural Costs and Prices (CACP, 2012) points out that in 2010-11 the average handling cost per metric tonne was Rs. 41.4 for contract labour as against Rs. 311.1 for Departmental labour, and Rs. 136.9 for Direct Payment System labour. There are roughly 16,000 Departmental workers, about 26,000 workers that operate under Direct Payment System (DPS). The Report of High Level Committee (GOI, 2015) has recommended that reliance on Departmental labour be reduced. It has further recommended that FCI be allowed to hire people under Direct Payment system or Non-Wage Non-Payment system and also that the condition of contract labour, which works the hardest and are the largest in number, should be improved by giving them better facilities.

The remaining four components of distribution costs are directly under the purview of the FCI viz. (i) storage charges (ii) administrative overheads (iii) storage shortages and (iv) transit shortages and it is here that that we can assess the performance of FCI *per se*.

Storage charges account for 10% of total distribution costs. It refers to cost of storing grains in own godowns of FCI or hired godowns. In addition to having own storage capacity, FCI hires storage capacities from Central Warehousing Corporation, State Warehousing Corporations,

State Agencies and Private Parties for short term as well as for guaranteed period under Private Entrepreneurs Guarantee Scheme. FCI hires storage space for a period of one year on a reservation basis or for shorter periods also on actual utilization basis to take care of increasing stocks. The Comptroller and Auditor General of India (CAG, 2013) points out that FCI's own storage capacity remained more or less constant in the period 2006-07 and 2010-11, while the stock of food grains in the Central pool increased. Consequently, hiring of storage space by FCI increased significantly during the period thus adding to the hiring charges. CAG (2013) further points out that a serious lacuna in storage management is that no standard norms have been prescribed for evaluation of optimal capacity utilisation in various godowns. Since 2010-11, however, we find that the share of storage charges has shown a downward trend (Fig. 6) thus suggesting some improvement on this front. However, a small increase in its share is observed in 2014-15 (Fig. 6). The administrative overheads include salaries and staff related costs. On this front too, we can see that the share of administrative overheads show a declining trend since 2010-11.

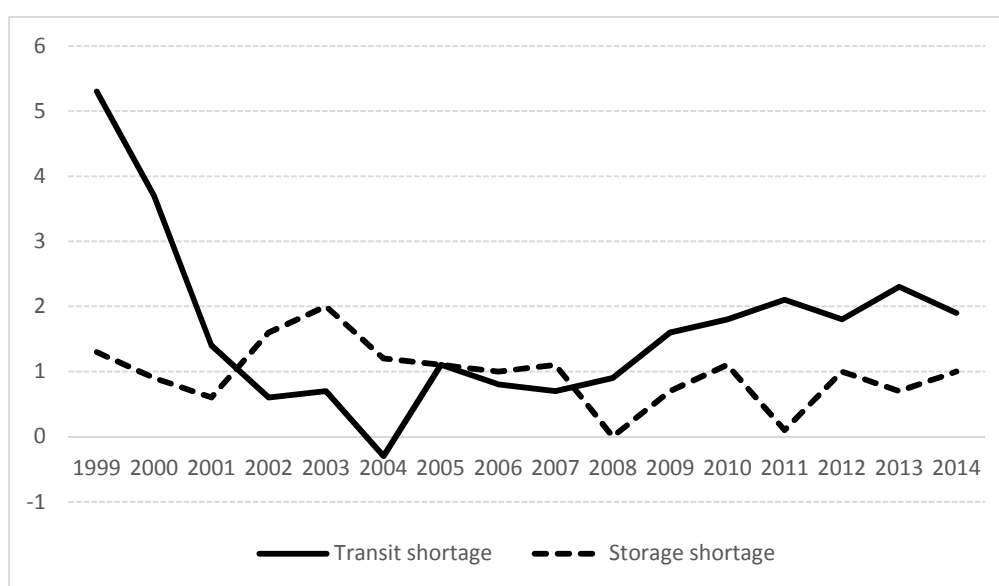
FIGURE 6 – *Share of Storage Charges and Administrative Overheads in Distribution Costs*



We now turn to cost incurred on account of storage shortages/ losses incurred by FCI. Storage losses take place due to fungus infestation in stocks, rodent problem, and spillage from gunny bags for inadequate stitches and prolonged storage. The Report of the High Level Committee (GOI, 2015) has recommended that cover and plinth storage should be phased out.

Transit shortages/ losses are losses which occur mostly during rail transportation. The fact that railways accept food grains on “said-to-contain” basis facilitates leakages. Further, railways do not issue clear railway receipts for food grains received as they are reluctant to bear transit losses. The despatching and receiving centres also receive the food grain stocks on an estimated basis which makes theft easy. Since food grains are not weighed at any stage during transportation, storage losses can easily be classified as transit losses.

FIGURE 7 - *Share of Transit and Storage Shortages in Distribution Costs*



Thus, of the four components of distribution costs under the control of FCI, storage charges and administrative overheads show an improvement. However, transit and storage losses (or shortages) continue to pose a problem.

The story so far is that an improvement in the FCI’s performance in terms of cost reduction will need significant change in the policies of the Government of India on the procurement front and on labour issues. At the level of FCI, there has been some improvement on storage charges and on administrative overheads but improvement can come from better planned transportation which will help put a check on freight charges and most importantly the transit and storage losses that have to be addressed on a priority basis if efficiency of FCI is to improve.

To further assess the performance of FCI we examine two indicators suggested by Swaminathan (1999) viz., ratio of economic costs to procurement price and the ratio of subsidy to procurement prices.

(a) Ratio of Economic Cost to Procurement Prices:

The ratio of economic costs to procurement prices will always be greater than unity as economic costs is a sum of procurement price, as well as distribution costs and procurement incidentals. A fall in the ratio indicates that sum of distribution costs and procurement incidentals vis-à-vis procurement prices have fallen, thus implying an improvement in operational performance of FCI while an increase in the ratio would imply a deterioration in the operational performance in FCI operations.

The averages for each period have been calculated as the geometric mean of the shares. The average ratio for period II vis-à-vis period I is lower in case of wheat but higher in case of rice thereby implying a slight improvement in case of wheat but a slight deterioration in case of rice. In the last five years i.e. from 2010-11 onwards we find an increasing trend in this ratio for both rice and wheat. Figure (8) below shows this trend pattern.

FIGURE 8 - Ratio of Economic Costs to Procurement Prices (%)

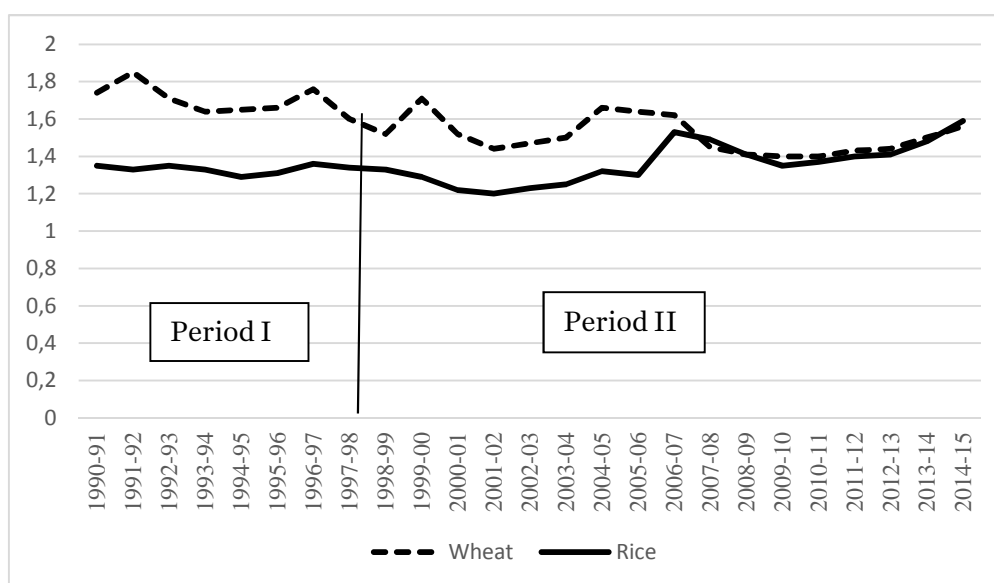


TABLE 11 - *Ratio of Economic Costs to Procurement Prices*

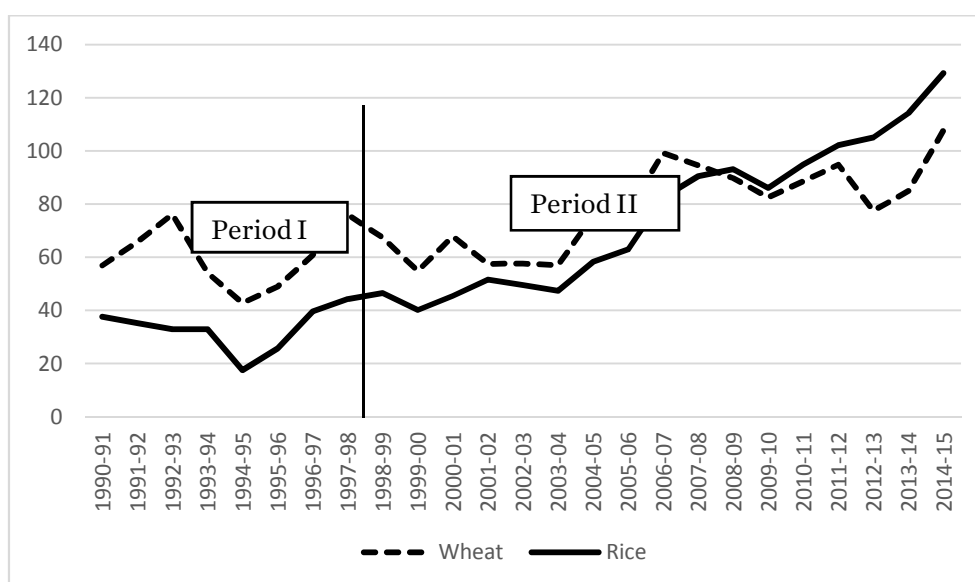
Year	Wheat	Rice
Period I		
1990-91	1.74	1.35
1991-92	1.85	1.33
1992-93	1.71	1.35
1993-94	1.64	1.33
1994-95	1.65	1.29
1995-96	1.66	1.31
1996-97	1.76	1.36
1997-98	1.60	1.34
1998-99	1.52	1.33
Average (Geometric Mean)	1.68	1.33
Period II		
1999-00	1.71	1.29
2000-01	1.52	1.22
2001-02	1.44	1.20
2002-03	1.47	1.23
2003-04	1.50	1.25
2004-05	1.66	1.32
2005-06	1.64	1.30
2006-07	1.62	1.53
2007-08	1.45	1.49
2008-09	1.41	1.41
2009-10	1.40	1.35
2010-11	1.40	1.37
2011-12	1.43	1.40
2012-13	1.44	1.41
2013-14	1.50	1.48
2014-15	1.56	1.59
Average (Geometric Mean)	1.51	1.36
<i>Source:</i> Calculated from data available at: http://fci.gov.in/finances.php?view=23		

(b) Ratio of Unit Subsidy to procurement prices of Rice and Wheat:

The ratio of unit subsidy to procurement prices serves as yet another indicator of the operational performance of FCI. A rise in the ratio implies that the subsidy is rising faster than the procurement prices thus implying a deterioration in operational performance of FCI.

The average ratio which is the geometric mean of the values, for both rice and wheat is higher in period II as compared to period I, thus implying a worsening performance for both rice and wheat in period II vis-à-vis period I.

FIGURE 9 - Ratio of Subsidy to Procurement Prices (%)



We find that this ratio shows a continuously increasing trend i.e. the general trend has been a deterioration in operational performance of FCI, barring an improvement in a few specific years (i.e. fall in the ratio). In fact it is only in five of the sixteen years in period II that we find a fall in the ratio for either rice or wheat or both (more specifically we find that in 2005-06, 2008-09 and 2009-10 the ratio for rice fell and in 2005-06, 2007-08, 2008-09, 2009-10 and 2012-13 the ratio for wheat fell).

Juxtaposing this result of increasing subsidy to procurement prices with our earlier analysis of the components of economic costs clearly points out that procurement prices have played a very

significant role in the increasing economic costs of FCI and the consequent increase in subsidy. What has also added to FCI's economic costs is the increase in statutory charges which have also registered a large increase. From the point of view of FCI's operations *per se*, we notice that there has in fact been some improvement in storage charges and administrative overheads but there is scope for improvement in transit and storage losses, which show an increasing trend in recent years. The broad message that emerges from our detailed analysis of economic costs and its components is that if performance of FCI is to improve and subsidies are to be curbed then FCI alone cannot do much. It is the policies of the central government, especially in connection with procurement prices, statutory charges which will all have to be reconsidered. Alongside that from the point of view of FCI itself, there is need to curb transit and storage losses. It may be pointed out at this juncture that despite costs being borne by the government in the form of subsidies, welfare gains are possible when subsidising production and consumption in the open market. A necessary condition for this would have to be free internal trade (Alagh, 2013)

TABLE 12 - Ratio of Subsidy to Procurement Price per quintal

Year	Wheat	Rice
Period I		
1990-91	56.9	37.6
1991-92	65.8	35.2
1992-93	76.1	32.9
1993-94	54.1	32.9
1994-95	42.8	17.5
1995-96	49.0	25.7
1996-97	60.8	39.5
1997-98	76.0	44.3
1998-99	67.4	46.5
Average (Geometric Mean)	59.99	33.45
Period II		
1999-00	54.8	40.2
2000-01	67.9	45.4
2001-02	57.5	51.6
2002-03	57.6	49.5
2003-04	57.0	47.4
2004-05	75.6	58.2
2005-06	77.4	62.9
2006-07	99.1	82.4
2007-08	94.6	90.5
2008-09	89.8	93.1
2009-10	82.5	86.0
2010-11	88.6	94.8
2011-12	94.8	102.2
2012-13	77.5	105.1
2013-14	84.9	114.2
2014-15	107.7	129.2
Average (Geometric Mean)	77.52	73.50
<i>Notes:</i> (a) Subsidy= Economic Cost – Sales realization (b) Subsidy = (procurement price + procurement incidentals + distribution costs) – sales realization		

5. FINANCIAL POSITION OF FCI: SOME ADDITIONAL INDICATORS

We now turn to some additional measures to assess the financial performance of the FCI. The Annual Reports of FCI from 1992-93 to 2014-15 have been considered to examine the financial indicators. Although the data in the financial reports of FCI include sugar in addition to paddy, rice and wheat, we can get an idea of the financial viability of the FCI as sugar has a very low weightage in the total volumes of FCI. The indicators considered are:

- (i) Sales as a percentage of cost of sales
- (ii) Expenses as a percentage of total costs (cost of sales plus expenses)
- (iii) Subsidy as a percentage of sales

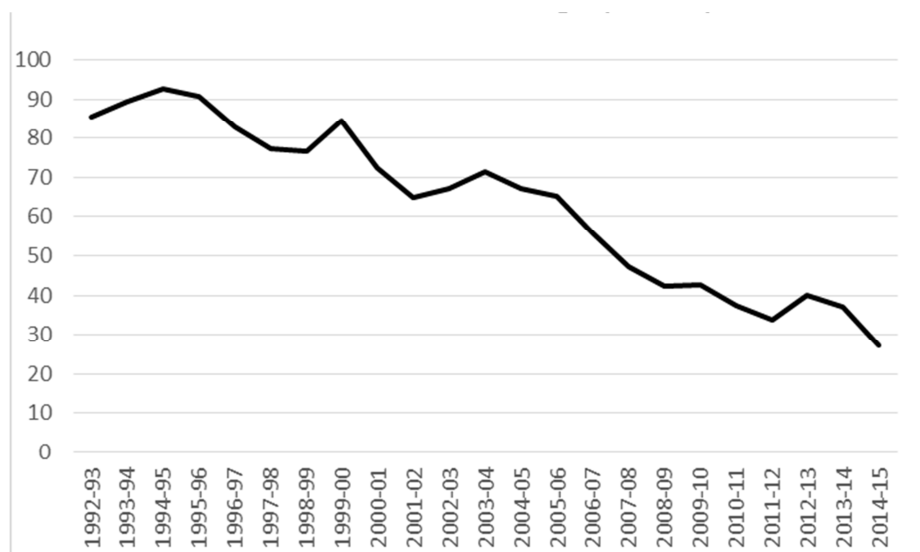
Cost of sales refer to the procurement costs of FCI in its balance sheet; expenses refer to the handling costs, storage and other items of distribution costs; sales indicate the sales realization of FCI from sales of wheat, rice and sugar.

(i) Sales as a Percentage of Cost of Sales

This indicator would capture if the sales realization of FCI has been sufficient to cover the cost of sales. The cost of sales is the pooled cost of grain. The pooled cost of grain as calculated by FCI in their accounts is a weighted average cost of the opening stocks at the previous year's MSP and procurement at the current year's crop at the current MSP. This indicator can be labelled as a "policy parameter" as both sales and cost of sales are a result of policy of the central government. Figure 10 shows the trend in the parameter between 1992-93 to 2014-15.

We find sales as a percentage of costs shows a downward trend indicating that the increase in sales realisation by the FCI has been lower than the increase in the cost of sales thus leading to a falling ratio which can be a threat to the financial viability of the organisation. This is in fact to be expected because the issue prices have increased very marginally in last decade.

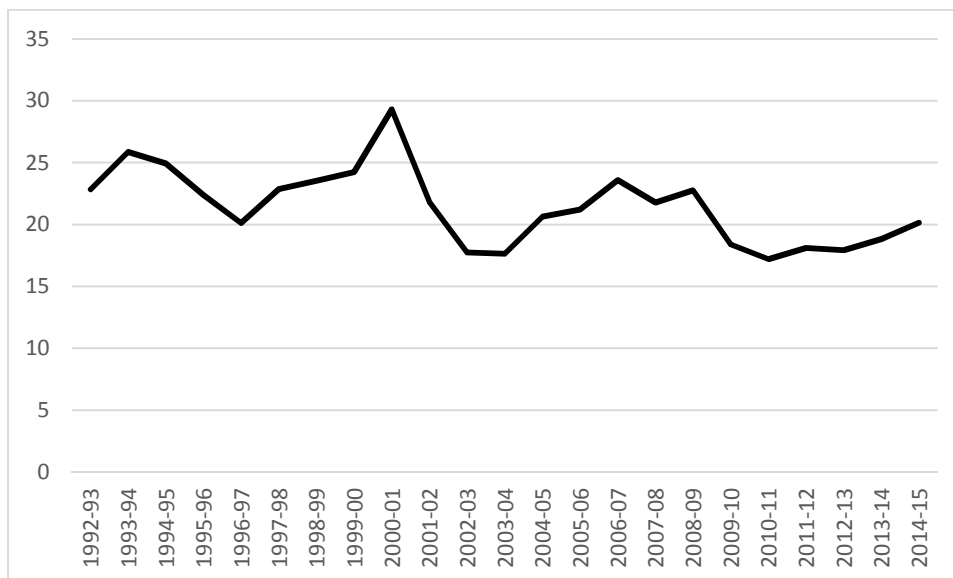
FIGURE 10 – Sales as a Percentage of Costs of Sales

*(ii) Expenses as a Percentage of Total Costs (Cost of Sales plus Expenses)*

The second parameter viz. expenses as a percentage of costs can be considered to be a parameter as it shows how much the operating expenses have increased in comparison to the total costs. Expenses of FCI include freight, handling expenses, employees' remuneration and benefits, interest, depreciation and others. Total costs include the pooled cost of grain, procurement incidentals as well as distribution costs. Expenses as a percentage of total cost shows how efficiently FCI operates. This ratio can thus provide some indication of the level of efficiency in FCI operations.

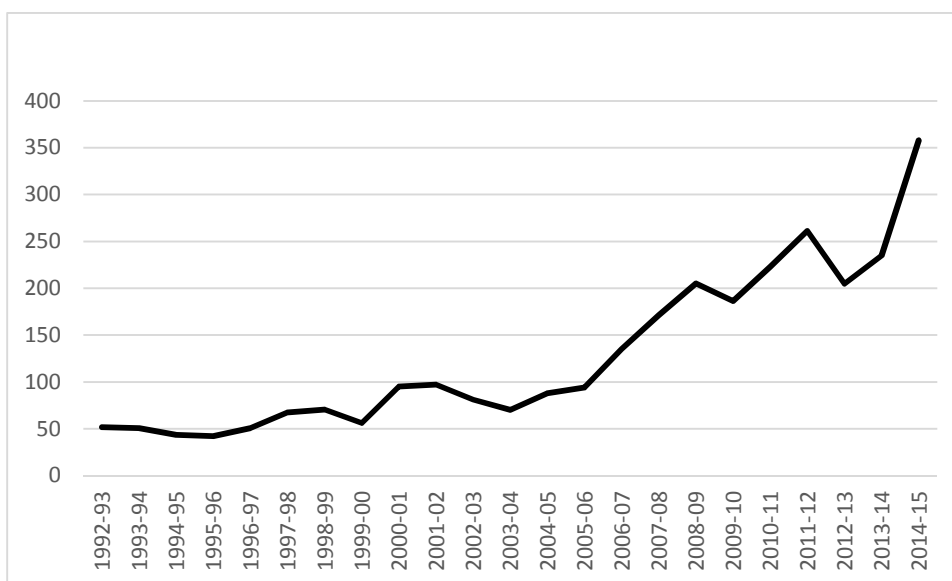
Figure 11 shows that expenses as a percentage of total costs has mostly remained in the same range for the later years. This is because both expenses and total costs have increased at the same rate till recently. In fact the last few years has seen an improvement. Thus it would appear that the performance of FCI has not deteriorated on this count. A similar conclusion was reached by Sharma (2012) and Sharma and Alagh (2013) when they claimed that distribution costs did not have a significant impact on total food subsidy. Swaminathan (1999), has also claimed that FCI's operating expenses are not the main reason why subsidies have increased.

FIGURE 11 - Expenses of FCI as a Percentage of Costs

*(iii) Subsidy as a Percentage of Sales*

Subsidy and sales have both increased over the period under consideration, but clearly the former has increased much faster than the latter. Subsidy being a derived figure as a difference between sales and total costs, this ratio has increased primarily due to an increase in costs of the FCI. Figure 12 shows the trend in subsidy as percentage of sales.

FIGURE 12 - Subsidy as Percentage of Sales



Subsidy as a percentage of sales has shown a sharp increase since 2003-04 indicating deterioration of fiscal position FCI. However, 2012-13 saw a fall in that ratio as sales increased by around 49% thereby reducing the gap between sales and total cost, which resulted in subsidy increasing by only 17%. Following that, it rose sharply again especially in 2014-15, due to a fall in sales and an increase in subsidy.

6. CONCLUSION

The burden of food subsidy on the government exchequer has undoubtedly shown a steady increase. This has often led to the finger being pointed towards the high costs of FCI. Our analysis of the decomposition of costs of FCI shows that it is the procurement policy of FCI which is imposed on it by the Central government and the Central Issue Price also fixed by the Central government, which are largely responsible for the rising economic cost of FCI and hence the food subsidy.

We may, however, point out at this juncture that support prices though of high cost to the government are not always a factor that results in welfare losses. The impact of support price on welfare of consumers and producers has been the subject matter of study for a large number of studies (Alagh, 2013; Landes, 2008; Dev and Rao, 2010; Jha and Srinivasan, 2006; Parikh *et al.*, 2003).

In the context of the mandate of the FCI for food security and the pressure from protagonists of free markets to open up foodgrains exports, it is a well-known fact that world agricultural markets are thin and hence highly volatile. Hence attention needs to be given to calibrate trade policy with volatile international prices of food and simultaneously high MSP's. Between November 2011 and April 2012 the International Wheat Monthly Price in US Dollars per metric ton had fallen by 5.35% (Index-mundi.com²). Meanwhile as per media reports in June 2012, measures were being taken to expedite wheat exports (Economic Times, June 2012). Thus the situation was of one of low international prices of wheat and subsidy being given for wheat exports. This led to glaring contradictions in government policy (Chand, 2009).

While analysing the performance of the FCI itself, we find that distribution costs, which are directly under FCI, show some deterioration, particularly in case of transit and storage losses.

² At: <http://www.indexmundi.com/commodities/?commodity=wheat&months=120>.

However, these costs constitute a small share of total costs. Administrative overheads of FCI in fact, show some improvement. We believe that the suggestion in the Report of the High Level Committee (GOI, 2015) of giving the FCI a “face lift” in terms of granting greater autonomy and flexibility will go a long way in reducing the economic cost of FCI, as this would change the incentive structures and ensure that the credit and flack can both be laid at the doorstep of the FCI.

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