

Study on Productivity of Central Public Enterprises - Performance Analysis with regard to Profit Contribution, Capacity Utilization and Inventory Management

Thanniru Srinivas

*B.Com (Hons.), L.L.B, MBA
Practicing Advocate, Hyderabad
PhD Scholar at JNTU, Hyderabad*

Prof. Rajanath Koppula

*B.Tech (Hons), M.Tech, MBA, PhD.
Member Advisory Committee Ascent Consultants, Hyderabad*

Abstract: Considering the economic condition of the country, post-independence, Government of India initiated the Central Public Enterprises as one of the measures for speedy industrial and economic growth in the country and started huge capital investments in these enterprises. However, on realizing the performance of these enterprises were not up to the expectations, several measures were taken up by Government of India from the sixth plan period onwards and subsequent Globalization Policy, i.e. New Economic Policy of 1991-92, followed by Disinvestment Policy and Memorandum of Understandings etc to improve upon the “Productive Performance of CPEs”. More than two decades have been complete since the measures were implemented and, in this context, the present study was conducted to understand the productivity of CPEs with a focus on three important parameters: “Profit contribution to Net Profit from Profit making CPEs”, “Inventory Management” and “Capacity Utilization”. The data analysis was carried over a period of 24 years, between 1993-94 and 2016-17 and the results of the study were submitted in conclusions.

Keywords: Central Public Enterprises, Productive Performance, Inventory Management, Capacity Utilization and Profit from Profit Making Public Enterprises

1.0. Introduction:

Realizing the economic situation soon after independence, Government of India took various measures, including establishment of Central Public Enterprises (CPEs) for faster growth of industrialization and economy. The action was also justified due to the fact that the private enterprises were not having capacity for such huge investments and the required technical and managerial skills. There were only five CPEs with an investment of Rs. 29 crores at the end of first five year plan which grew continuously and as on 31st March 2017, there are 257 CPEs with an investment of Rs. 21, 44, 924 crores.

Understanding that performance of CPEs was not up to expectations; Government of India took several measures from the sixth five year plan onwards. Further, with the implementation of New Economic Policy (NEP) during 1992 and subsequent measures of disinvestment and memorandum of understandings (MOUs) etc were taken up to improve performance.

Performance or “Productivity” of CPEs is an important dimension to assess their contribution to the National exchequer. In this context, Profits contributed by Profit making CPEs as a percentage of Capital employed was calculated for four years, two each from pre and post NEP and presented below, which indicate that Profit contributions by CPEs is minimal.

Year	90-91	91-92	92-93-	93-94
No. of Operating CPEs	236	237	239	240
Capital Employed	101707	117991	140110	159836
Profit from Profit making CPEs	5432	6079	7384	9768
% of Profit from Profit making CPEs to Capital Employed	5.36	5.15	5.27	6.11

Source: PE Annual Survey Reports Vol.1, 1993=94, Macro View Performance of CPEs

Productivity is a measure for understanding how efficiently all the resources, including unprocessed raw materials to finished goods ready for sale, are processed/converted in to output(s) by enterprises. Some of the important indicators adopted by Department of Public Enterprises (DPE) ⁽¹⁾, for assessing productivity of CPEs are “Capacity Utilization“ and “Inventory”.

2.0. Literature Review:

2.1. Eric Boafodadzie etal (2016) ⁽²⁾, in their article titled “The Role of Inventory Management on Productivity in the Sector” stated that organizations rely on Inventory to balance supply and demand, and to buffer uncertainties in the supply chain. The article concludes that for an organization to enhance productivity, it needs to effectively and efficiently manage inventory.

2.2. K. Suvedya, (2013) ⁽³⁾ in her article titled “Performance of Central Public Enterprises in a Phase of Economic Liberalization – An Analytical Approach”, stated that to a large extent the CPEs have excelled in their Physical and Financial Performance.

2.3. RuddarDutt etal (2007) ⁽⁴⁾, in their book entitled “Indian Economy” reiterate to make use of combination of factors such as investment, profitability etc. for assessing the performance of CPEs.

2.4. RK Mishra (2006) ⁽⁵⁾ in his article on “Performance of Public Enterprises in the era of Economic Liberalization” state that various profitability indicators are available to assess the performance of CPEs.

2.5. VL Mote etal (2006) ⁽⁶⁾ in their article “Productivity and Public Sector Units” state that productivity is the ultimate factor for existence of any enterprise regardless of ownership factor.

2.6. Afghan Ahmed (1997) ⁽⁷⁾, in his book “Public Enterprises and Economic Development” states that the performance of public enterprises is not up to the mark, inspite of their huge contribution to National exchequer.

2.7. In a review conducted by Arjun Sengupta Committee (1986) ⁽⁸⁾, it is stated that over a period, the growth of CPEs has been phenomenal in terms of investment, but the overall performance in terms of their contribution to the generation of resources and financial profitability is unsatisfactory. Further, the report commented that while assessing the performance of public enterprise, the criteria should include productivity factor also.

3.0. Objective of the study

In view of the above, the objective is to “Study the productive performance of CPEs in respect of their profit contribution, inventory management and capacity utilization”.

4.0. Research Methodology:

4.1: The research methodology adopted is empirical study.

4.2: The basic source of information is secondary and the Public Enterprise Annual Survey Reports forms the major share. The other sources of information are review of literature including books and published articles in reputed journals.

4.3: The methodology adopted for data analysis includes the following three parameters:

- Percentage of contribution from Profit making CPEs to Net Profit, Percentage of contribution of profit making CPE’s to Net Profit would give a better understanding on the productive performance of CPEs. The parameter’s calculation is given below:

No. of CPEs contributing to Profit

$$\text{Percentage of CPEs contributing to Profit} = \frac{\text{Total No. of operating CPEs}}{\text{Total No. of operating CPEs}} \times 100$$

- Inventory Management measured in number of days,

Inventory ⁽⁹⁾ or stock is the goods and materials that an enterprise holds for the ultimate goal of resale (or repair). Inventory must be accurately valued to determine an enterprise’s profit or loss. Inventory Management in Public Enterprises is interpreted in “Number of Days” ⁽¹⁰⁾. To arrive at the number of days, first Inventory Turnover Ratio (ITR) is calculated and then the Inventory in number of days is calculated. The steps involved are:

$$\text{Inventory Turnover Ratio (ITR)} = \frac{\text{Cost of Production}}{\text{Average Value of Inventory}}$$
$$\text{Inventory in Number of days} = \frac{365}{\text{ITR}} \quad (365 \text{ divided by ITR})$$

$$\% \text{ Inventory in number of days} = \frac{\text{Inventory in no. of days}}{\text{No. of operating CPEs}} \times 100$$

- Capacity Utilization measured as percentage of installed capacity.

Capacity utilization of CPEs is measured based on the installed capacity and in the case of multi product CPEs, capacity utilization relates to major product(s) ⁽¹¹⁾. The CPEs adopt a three variant structure with regard to capacity utilization. They are “Units which have recorded 75% or more capacity utilization”, “Units which have recorded 50% or more but less than 75%” and “Units which have recorded less than 50% capacity utilization” ⁽¹²⁾. The present study opted the first variant i.e. units which have recorded 75% or more capacity utilization as an appropriate parameter, particularly, in the context of productivity study.

4.4: Period of Study: The data was collected for a period of 24 years between 1993-94 and 2016-17 on the following parameters:

- Number of operating CPEs,
- Capital Employed,
- Net Profit,
- Profit from Profit making CPEs,
- Loss from Loss making CPEs,
- No. of Profit making CPEs
- No. of Loss making CPEs
- Inventory management in no. of days, and
- Capacity utilization \geq 75% of installed capacity.

5.0. Data Analysis:

The data was collected and collated for the period between 1993-94 and 2016-17 and presented in terms of:

- j. Financial Performance with a focus on profit making CPEs contributing to Net Profit,
- jj. Inventory in terms of No. of days, held by CPEs, and
- jjj. Number of CPE units delivering capacity utilizing \geq 75% of installed capacity.

5.1. Financial Performance: The details with regard to Financial Performance of CPEs were collected from Annual Survey Reports of Public Enterprises for operating CPEs, for the period between 1993-94 and 2016-17 and presented at Table-1:

Table-1
Financial Performance of CPEs between 1993-94 and 2016-17

Year	93-94	94=95	95-96	96-97	97-98	98-99
No. of Operating CPEs	240	241	239	236	236	235
Capital. Employed	159836	162451	173948	231178	249855	265093
Net Profit	4545	7187	9574	10186	13582	13203
Profit of Profit Making PEs	9768	12070	14763	16125	20279	22508
Loss of Loss Making PEs	5223	4883	5188	5939	6697	9305
No. of PEs making Profit	121	130	132	129	134	126
No. of Loss Making PEs	116	109	102	104	100	107

Table-1 (Contd.)

Year	99-00	00-01	01-02	02-03	03-04	04-05
No. of Operating CPEs	232	234	231	227	230	227
Capital. Employed	302867	331401	390162	418758	452336	504407
Net Profit	14331	15653	25978	3214	49010	63889
Profit of Profit Making PEs	24333	28494	36432	43085	61606	74432
Loss of Loss Making PEs	10302	12841	10454	10944	8522	9003
No. of PEs making Profit	126	123	120	118	139	143
No. of Loss Making PEs	105	110	109	107	89	73

Table-1 (Contd.)

Year	05-06	06-07	07-08	08-09	09-10	10-11
No. of Operating CPEs	226	217	214	213	217	220
Capital. Employed	585484	66138	724009	792232	908007	1153833
Net Profit	66344	77175	81274	83867	92203	92129
Profit of Profit Making PEs	76382	3885	91577	98488	108434	113944
Loss of Loss Making PEs	6845	89581	10303	14621	16231	21816
No. of PEs making Profit	160	156	160	158	157	158
No. of Loss Making PEs	63	59	54	55	60	62

Table-1 (Contd.)

Year	11-12	12-13	13-14	14-15	15-16	16-17
No. of Operating CPEs	225	250	234	236	244	257
Capital. Employed	1337821	1508177	1710453	1833274	2037372	2144924
Net Profit	98246	114981	128295	102866	114239	127602
Profit of Profit Making PEs	125929	143543	149636	130364	144998	152647
Loss of Loss Making PEs	27683	28562	21341	27498	30759	25045
No. of PEs making Profit	161	151	164	129	164	174
No. of Loss Making PEs	64	78	70	76	79	82

Source: PE Survey Report, 2002-03, Volume-1, Pp.24, 2016-17, Vol. 1, Pp.17.

From the above collected data, the percentage of profit contribution to net profit from profit making CPEs was calculated and the findings are tabulated below at Table-2.

Table-2

% of Profit and Loss Making CPEs Year wise between 1993-94 and 2016-17

Year	1993-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
% of Profit contribution from Profit making CPEs	50.4	53.9	55.6	54.7	74.8	74.2	72.4	71.8

Table-2 (contd.)

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
% of Profit contribution from Profit making CPEs	52	52	60.4	62.3	70.8	71.9	74.8	74.2

Table-2 (contd.)

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
% of Profit contribution from Profit making CPEs	72.4	71.8	71.6	60.4	70.1	54.7	67.2	67.7

The data thus built up with regard to “% Profit contribution from Profit making CPEs” has been graphically presented at Fig.1, towards the end of the article.

Summary of Findings:

An analysis of the data at Table-1 would indicate that “Net Profit” has increased from Rs. 4,545 crores during the year 1993-94 to Rs. 92,129, during the year 2016-17, indicating more than 20 fold increases in profitability of all the operating CPEs put together. However, the findings from the study, given at Table-2, indicate a fluctuating scenario. During 1993-94 year the % was 50.4% and touched the highest figure of 74.8% during the year 1997-98 and during the year 2007-08 only after touching a nadir at 52% during the years 2000-01 and 01-02 and finally stood at of 67% during the year 2016-17. Further, it may be observed that only 65.09% of CPEs from profit making operating enterprises on an average over 24 years (i.e. 50.4+53.9+55.6+54.7+74.8+74.2+72.4+71.8+52+52+60.4+62.3+70.8+71.9+74.8+74.2+72.4+71.8+71.6+60.4+70.1+54.7+67.2+67.7 = 1562, which is when divided by 24 results to 65.09%) are contributing to Net Profit. It means nearly 35% of CPEs are not contributing to Profitability and to that extent they are unproductive.

5.2. Inventory Management:

Year wise inventory in number of days maintained by operating CPEs for the period 1993-94 to 2016-17 was collected and tabulated as given below at Table-3.

Table: 3
Inventory Management between 1993-94 and 2016-17

Year	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
No. of Operating Enterprises	240	241	239	236	236	235	234	231
Inventory Maintained in No. of Days	87	77	70	72	69	58	54	44

Table: 3 (Contd.)

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
No. of Operating Enterprises	227	230	227	226	217	242	214	2139
Inventory Maintained in No. of Days	44	46	42	43	43	46	49	40

Table: 3(Contd.)

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
No. of Operating Enterprises	217	220	225	230	234	236	244	257
Inventory Maintained in No. of Days	54	54	55	53	55	50	49	58

Source: Department of Public Enterprises Survey Report, Vol.1, 2002-03, Pp.30 (1992-93 to 1996-97) and Survey Report 2016-17, Vol.1, Pp. 51, Table - 4.14 (1997-98 to 2016-17).

The inventory levels in public enterprises have been fluctuating between the years 1993-94 and 2016-17. The inventory level, which was 87 numbers of days as on 31.3.1994, had declined to 42 numbers of days as on 31.3.2004 and finally stood at 58 days as on 31.03.2017.

From the above data, the % of Inventory maintained by each CPE was calculated and presented below at Table-4:

Table-4
Percentage Inventory held by each CPE

Year	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
Percentage Inventory	36.3	32	29.3	30.5	29.2	24.7	23.1	19

Table-4 (contd.)

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
Percentage Inventory	19.4	23	18.5	19	19.8	19	19.9	16.1

Table-4 (contd.)

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
Percentage Inventory	23.01	24	24.4	23	23.5	21.2	20.1	22.6

The graphical trend of the above data is given at Fig. 2 towards the end of the article.

Summary of Findings:

The trend shows that the percentage of inventory maintained, which was 36.3 during the year 1993-94 has been lowering, touching a nadir at 16.1, during the year 2008-09 and again raised and stood at 22.6 during the year 2016-17.

5.3. Capacity Utilization:

The data in respect of CPEs whose capacity utilization has been equal or more than 75% of installed capacity has been collected and presented below at Table-5.

Table-5

Capacity Utilization equal or more than 75% of Installed capacity of CPES for the period between 1993-94 and 2016-17

Year	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
No. of Operating CPEs	240	241	239	236	236	235	234	231
No. of CPEs with \geq 75% Capacity utilized	52	55	56	59	55	51	58	61

Table-5 (contd.)

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
No. of Operating CPEs	227	230	227	226	217	242	214	213
No. of CPEs with \geq 75% Capacity utilized	52	54	53	53	51	55	62	58

Table-5 (contd.)

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
No. of Operating CPEs	217	220	225	230	234	236	244	257
No. of CPEs with \geq 75% Capacity utilized	67	72	65	60	50	75	83	77

Source: Department of Public Enterprises Survey Report, Vol.1, 2002-03, Pp.30 (1992-93 to 1996-97) and Survey Report 2016-17, Vol.1, Pp. 51, Table - 4.14 (1997-98 to 2016-17).

The data thus obtained was directly plotted to obtain graphical trend, which is presented at Fig. 3 towards the end of the article.

Summary of Findings:

The trend indicates that while 52 CPEs had represented the category of \geq 75% capacity utilization of installed capacity during the year 193-94 had several ups and downs, touching a nadir at 50 during the year 2013-14 and finally stood at 77 during 2016-17 after reaching the highest figure of 83 during 2015-16.

6.0. Summary & Conclusions:

6.1. Summary of Findings

6.1.1. With regard to Profit contribution from Profit making CPEs:

The above detailed analysis indicates that only 65.09% of profit from profit making operating enterprises is contributed to net profit in any year between the study period 1993-94 and 2016-17. It also means about 35% of CPEs are not contributing to profitability.

6.1.2. With regard to Inventory Management:

The data has been graphically plotted and the trend shows that the percentage of inventory, which was 36.3 during the year, has been reducing over a period of years, touching a nadir at 16.1, during the year 2008-09 and again galloped and stood at 22.6 during the year 2016-17.

6.1.3. With regard to Capacity Utilization:

The data analysis indicates high fluctuations in respect of capacity utilization (\geq 75% of the installed capacity). The capacity utilization during the year 1993-94 stood at 52, reached a high of 77 during the year 2016-17 while touching lowest 50 during the year 2013-14 and the highest 87 during the year 2015-16.

In order to have a better understanding of overall capacity utilization of CPEs, an average for 24 years capacity utilization was calculated as detailed below:

Sum total of capacity utilization during the 24 years period is equal to 1397 (52+52+56+59+55+51+58+61+52+54+53+53+51+55+62+58+67+72+35+60+50+75+83+77=1397), which is divided by 24 (years) resulted in to 58.21% of average capacity utilization \geq 75% of the installed capacity or in other words about 41.8% or nearly 42% of capacity utilization \geq 75% of the installed capacity is not delivered by CPEs on an average every year.

6.2. Conclusions

The above analysis conclude that CPEs have further scope to improve upon their productive performance in terms of Profit contributions to Net Profit by Profit Making CPEs, maintaining lower levels of Inventory Management in number of days and achieving higher capacity utilization.

7.0. Suggestions

The CPEs need to implement better inventory Management techniques, may be Just in Time, Materials Requirement Planning, to the extent possible depending upon the environment and availability of technology, to improve upon their productive performance.

Further, over the last two decades, many CPEs have been categorized as “Maha Ratnas”, “Nava Ratnas”, “Mini Ratnas” and large numbers of CPEs also have undertaken Memorandum of Understanding (MOU) with their respective governmental agencies. In spite of all these measures, CPE’s productive performance is not encouraging as stated above. It means there are certain inherent organizational or managerial weaknesses within CPEs and with their respective governmental agencies, which could be the cause(s) for the present state of productivity of CPEs. These weaknesses may be identified as bureaucratic attitude by the respective ministry/departmental agencies, frequent government interferences with the functioning of CPEs, pricing policy adopted by CPEs, CPEs being used as instruments for implementing or spreading the government policies etc. These factors have an influence on the productive performance of CPEs and therefore, they need to be reduced to the maximum extent possible for improving the productive performance of CPEs.

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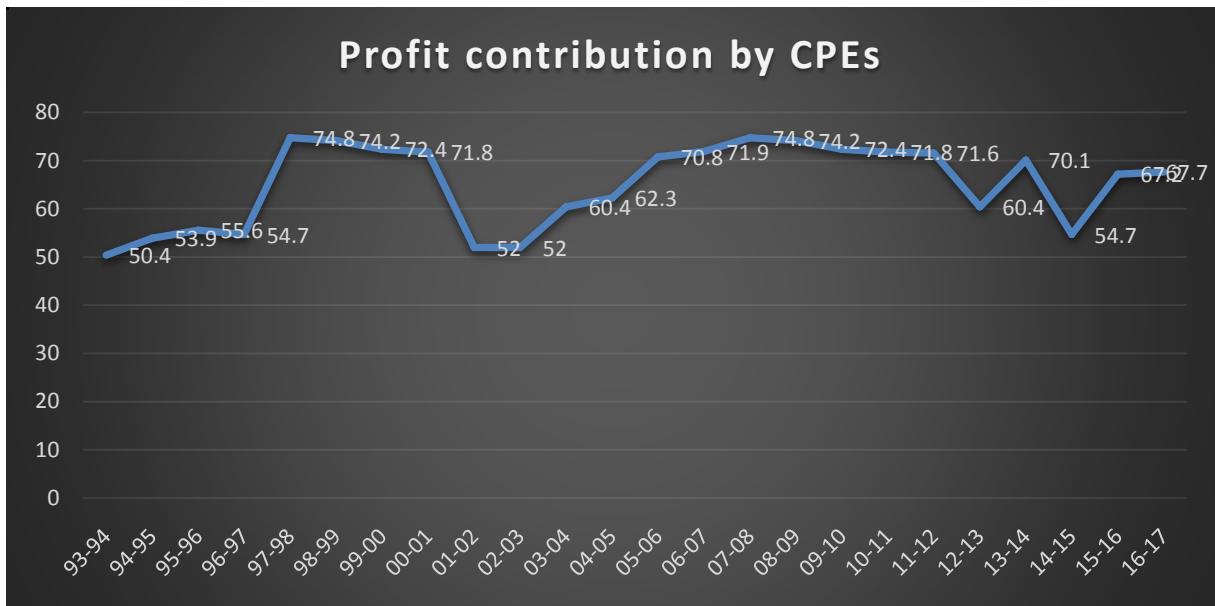
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Profit from Profit Making CPEs trend Graph

Year	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
No. of CPEs	50.4	53.9	55.6	54.7	74.8	74.2	72.4	71.8

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
No. of CPEs	52	52	60.4	62.3	70.8	71.9	74.8	74.2

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
No. of CPEs	72.4	71.8	71.6	60.4	70.1	54.7	67.2	67.7

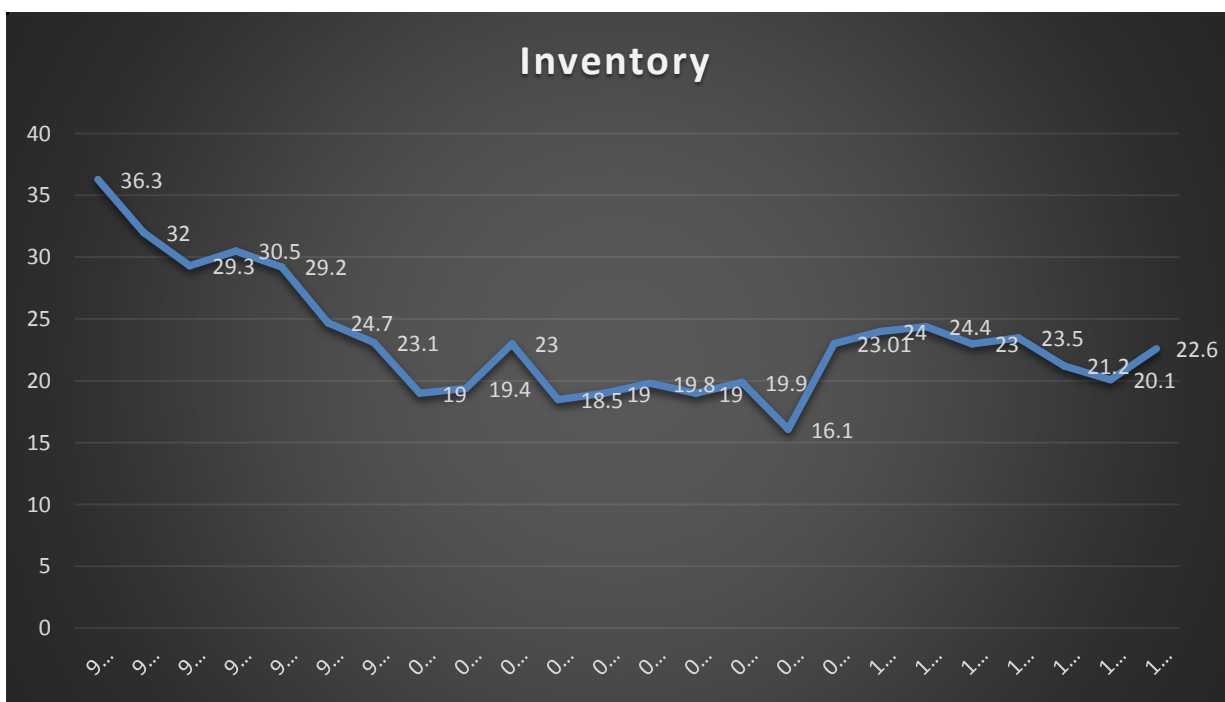


Percentage Inventory held by each CPE

Year	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
Inventory	36.3	32	29.3	30.5	29.2	24.7	23.1	19

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
Inventory	19.4	23	18.5	19	19.8	19	19.9	16.1

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
Inventory	23.01	24	24.4	23	23.5	21.2	20.1	22.6



Year wise Number of CPEs operating with $\geq 75\%$ Capacity Utilization

Year	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01
No. of Operating CPEs	240	241	239	236	236	235	234	231
CPEs with $\geq 75\%$ Capacity utilized	52	55	56	59	55	51	58	61

Year	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
No. of Operating CPEs	227	230	227	226	217	242	214	213
CPEs with $\geq 75\%$ Capacity utilized	52	54	53	53	51	55	62	58

Year	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
No. of Operating CPEs	217	220	225	230	234	236	244	257
CPEs with $\geq 75\%$ Capacity utilized	67	72	65	60	50	75	83	77

