A Relative Study of Average Investment Returns between Manufacturing Sector and Service Sector of CPSEs in India

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ABSTRACT

Purpose: *In India, CPSEs were established to achieve socio-economic objectives of the nation. Both manufacturing sector and service sector occupies an important position in the development process of an economy. In this context, a comparative study is performed between manufacturing sector and service sector of Indian CPSEs from 2010-11 to 2019-20.*

Design/Methodology/Approach: *Based on resultant data, investment ratios are employed to compute investment returns of the CPSEs. Moreover Fishers 't' test judge the differences (if any) in investment returns between manufacturing sector and service sector. In addition, linear regression equations are employed to inspect the impact of sector-wise investment returns on the aggregate investment returns.*

Findings/Result: *Based on average investment returns, no noteworthy difference is observed between manufacturing sector and service sector in terms of ROCE and ROE. However, there exists important distinction among the same for ROA which implies that manufacturing sector has better utilization of their total assets in generating returns than that of the service sector. ROCE of the manufacturing sector contributes positively to the overall profitability of the CPSEs, while ROCE of the service sector contributes negatively to the overall profitability of the CPSEs. It further observed that the rate of negative influence by the service sector is more than that of positive influence by the manufacturing sector, thereby reducing the overall profitability of the CPSEs at aggregate level.*

Originality/Value: *To identify the important sector in the liberal economic environment, the present study compares average investment returns between manufacturing sector and service sector of the CPSEs in India through ROA, ROCE, and ROE.*

Paper Type: *Empirical Research.*

Keywords: Investment Returns, CPSEs, Manufacturing Sector, Service Sector, ROA, ROCE, ROE.

1. INTRODUCTION :

The term "investment return" may be defined as a measure which is used to determine the profit from funds employed in the business. It is alternatively known as ROI. Thus, it indicates a relative measure where profit generated from investment is alienated by the outlay of fund invested. The resultant figure of ROI is multiplied by hundred to express it in percentage form.

ROI is useful for comparison of funds invested in diverse projects. However, holding period is not taken to consideration and therefore it may the opportunity cost involved in it. Basically, ROI indicates return on money, resources, and equity [1].

2. A SYNOPTIC OVERVIEW OF INDIAN CPSES :

In India, the Central Public Sector Enterprises (CPSEs) was set up in the country to achieve economic growth. They are viewed as a mechanism for structural change of the economy with equity and community fairness. The CPSEs started their journey with an entire capital expenditure of Rs. 29 crores, while the total capital expenditure was Rs. 16,40,628 crores as on 31.3.2019.

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The CPSEs supply essential merchandise and services. They occupy a noteworthy market position in crucial sectors of the country. CPSEs also operate in various competitive markets. The disinvestment procedure was introduced from the year 1991-92 to make the CPSEs efficient in various production activities.

3. PRIOR STUDIES :

A review of significant studies related to CPSEs is presented below in Table -1:

S. No.	Focus Area	References
	Table 1: Review of Past Studies on CPSEs	
1	The study stated that direct sale through cutthroat bidding is preferable since it allows elevated level of transparency.	Kumar, S. (1992) [2]
2	The researchers carried out a study to know whether privatization had increased the effectiveness of 12 companies in Chile, Malaysia, Mexico, and UK. The study indicated that all the troubles associated with the transition cannot be held responsible for privatization.	Galal, A. et al. (1994) [3]
3	The study observed that privatized companies became more competent and achieved better financial health.	Megginson, W.L. and Netter, J. M. (2001) [4]
4	The results indicated that disinvestment of the PSEs had little success during the period under study. The researchers suggested that several criticisms and controversies against disinvestment could be solved through a translucent procedure.	Ray, K. K. and Maharana, S. (2002) [5]
5	The study found better result for the CPSEs in the post-reform period which was related to sales, net worth, profit, and market capitalization.	Mathur, R. and Mathur, B. L. (2010) [6]
6	The study analyzed the challenges and impact of disinvestment. The study result stated that disinvestment in India did not produce satisfactory results.	Rastogi, M. K. and Shukla, S. K. (2013) [7]
7	The researcher examined the performance and disinvestment of profit and loss making Indian CPSEs. The study results found that CPSEs had improved their profitability due to disinvestment.	Singh, G. (2015) [8]
8	The study found significant increase in the overall operating efficiency in terms of sales and net income efficiency, whereas insignificant results were found in profitability position.	Mandiratta, P. and Bhalla, G. S. (2017) [9]
9	The study observed positive financial ratios among the upset and non-upset firms. It indicated that PSEs in India may become financially sound if they established a good system of financial management policy.	Richard, P. V. and Kalyani, B. (2019) [10]
10	The study observed that CPSEs in India had managed their working capital efficiently (except very last year) in the post-financial recession period, although they had followed an aggressive current assets policy.	Bansal, R., Misra, S. K., and Tandon, D. (2020) [11]

4. RESEARCH GAP :

The above review of past studies shows that several studies were carried with respect to different performance parameters of the CPSEs in India. However, we found no relative studies with respect to investment returns between manufacturing sector and service sector of the CPSEs in India. Hence, this study may be taken as the first study to contribute to the existing literature.

5. OBJECTIVES :

(1) To compare average investment returns between the manufacturing sector and service sector.
(2) To examine the influence of investment returns of each selected sector on the aggregate investment returns

6. CONCEPTUAL MODEL AND HYPOTHESES :

6.1 The Conceptual Model: For development of hypotheses in conformity with the objectives of the study, the conceptual model is presented below in Fig.1:
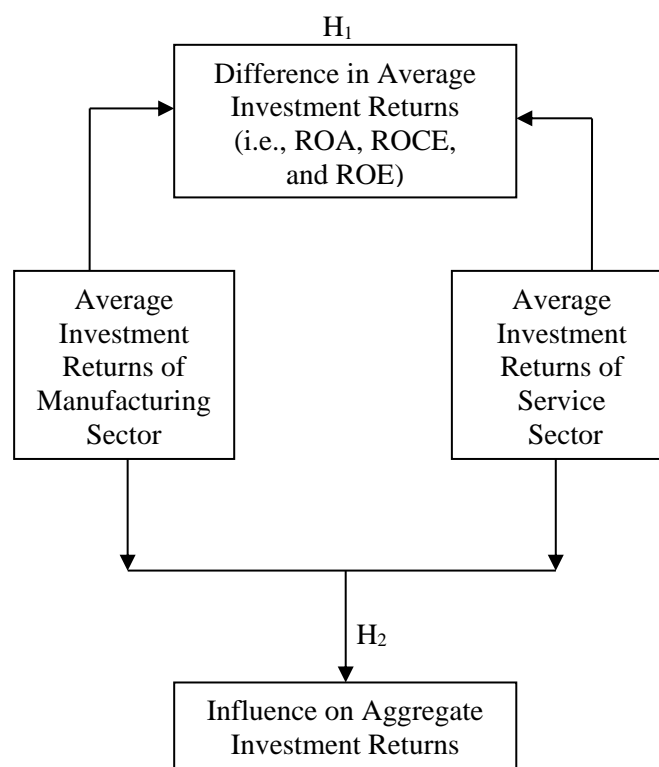
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Fig. 1: Conceptual Model for Development of Hypotheses

6.2 Statement of Hypotheses: On the basis of Fig.1, the hypotheses are stated below:
First Hypothesis (H_1):
H_{01}: There is no notable difference in average investment returns between the manufacturing sector and service sector.
H_{A1}: There is notable difference in average investment returns between the manufacturing sector and service sector.
Second Hypothesis (H_2):
H_{02}: There is no notable influence of sector-wise investment returns on the aggregate investment returns.
H_{A2}: There is notable influence of sector-wise investment returns on the aggregate investment returns.

7. RESEARCH METHODOLOGY :

7.1 Sample Selection: The sample of our study covers all the operating central public sector enterprises in India except the departmentally run public enterprises, insurance companies, and banking institutions.
7.2 Study Period: The study period has been selected from 2010-2011 to 2019-2020. Further, the whole study period is sub-divided into two sub-periods (i) 1st sub-period: 2010-11 to 2014-15 and (ii) 2nd sub-period: 2015-16 to 2019-20.
7.3 Data Source: The study is based on resultant data. The required data is sourced from the published annual reports of the Public Enterprises Survey, Govt. of India. Further, aggregate level data has been used in order to reach at a meaningful conclusion. [12]
7.4 Tools: The tools used are stated below.
The investment returns are indicated by the ratios which are indicated below: [13]
ROA = Net Returns after Levy ÷ Total Assets
ROCE = EBIT ÷ Capital Employed
ROE = Net Returns after Levy ÷ Shareholders' Equity
Fisher's 't' test is calculated to examine significant differences (if any) between average value of investment returns in manufacturing sector and service sector. [14]
The 't' statistic is shown below:

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$$t = (\overline{x_1} - \overline{x_2}) \div [s \sqrt{(1 \div n_1) + (1 \div n_2)}]$$

Where: $s = \sqrt{(n_1 S_1^2 + n_2 S_2^2) \div (n_1 + n_2 - 2)}$;

S_1 and S_2 = S.D. of the samples

$\overline{x_1}$ and $\overline{x_2}$ = average of the samples;

n_1 and n_2 = sample sizes; and

D.F. = $(n_1 + n_2 - 2)$.

To inspect the effect of sector-wise investment returns on the aggregate investment returns of the CPSEs, linear regression equation is fitted to the pertinent yearly time sequence data. Linear regression equations employed in this context are shown below: [15]

$ROA = a + bX_i + U_t$

$ROCE = a + bX_i + U_t$

$ROE = a + bX_i + U_t$

The regression coefficients are tested by 't' test.

8. FINDINGS :

8.1 Comparison of Average Investment Returns between Manufacturing Sector and Service Sector: On analyzing Table - 2, it is observed that average investment returns generated by the manufacturing sector are better than that of average investment returns of the service sector during all the periods (except ROCE in the 2nd half). Thus, manufacturing sector has recorded superior performance as compared to service sector in most of the cases under study.

Table 2: Comparison of Average Investment Returns between Manufacturing Sector and Service Sector during 2010-11 to 2019-20		
Ratios	**Manufacturing Sector**	**Service Sector**
Whole Period		
ROA	0.03	0.01
ROCE	0.13	0.10
ROE	0.05	0.01
1st Sub-Period		
ROA	0.03	-0.002
ROCE	0.15	0.09
ROE	-0.01	-0.05
2nd Sub-Period		
ROA	0.03	0.01
ROCE	0.10	0.11
ROE	0.11	0.06
Source: Author's Calculation.		

8.2 Fisher's 't' Test for Average Investment Returns between Manufacturing Sector and Service Sector: To arrive at a meaningful conclusion, whole period is considered for the purpose of our analysis. Table - 3 reveals that the average value of ROA (0.03) in the manufacturing sector is higher than that of the average value of ROA (0.01) in service sector which is noteworthy at 5% level. This shows that ROA in manufacturing sector is better as compared to ROA in service sector during the whole period. The outcomes are insignificant for ROCE and ROE.

The above investigation accepts first null hypothesis for ROCE and ROE. For ROA, the first null hypothesis is rejected, which indicates that manufacturing sector has better exploitation of their entire resources in generating returns than that of the service sector.

Table 3: Fisher's 't' Test for Average Investment Returns between Manufacturing Sector and Service Sector during 2010-11 to 2019-20				
Investment Ratios	**Period**	**Average Investment Returns of Manufacturing Sector (in times)**	**Average Investment Returns of Service Sector (in times)**	**'t' value**

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ROA	Whole Period	0.03	0.01	2.63[**]
ROCE	Whole Period	0.13	0.10	1.54 [i]
ROE	Whole Period	0.05	0.01	0.81 [i]

[**] significant at 5% level (2-tailed).
[i] insignificant.

Source: Author's Calculation.

8.3 Influence of Investment Returns of each Selected Sector on the Aggregate Investment Returns: This section attempts to examine the influence of investment returns generated by the manufacturing sector as well as by the service sector on the aggregate investment returns of the CPSEs through regression equations. For analysis, investment returns of each chosen sector are taken as independent variable, while the dependent variable is represented by aggregate investment returns of the CPSEs.

From Table - 4, it is found that ROCE in manufacturing sector has an affirmative influence (0.20) on the aggregate ROCE of the CPSEs which is significant at 5% level. For ROA and ROE, the manufacturing sector has no momentous influence on the aggregate ROA and ROE of the CPSEs. For service sector, ROCE has a negative influence (-0.39) on the aggregate ROCE of the CPSEs which is noteworthy at 5%. For ROA and ROE, the results are insignificant.

The above analysis indicates that for ROA and ROE, the results are insignificant in manufacturing sector and service sector, thereby leading to the acceptance of the second null hypothesis. For ROCE, the results are momentous in both the sectors, thereby leading to the rejection of the second null hypothesis. This shows that manufacturing sector contributes positively to the overall profitability of the CPSEs, while service sector contributes negatively to the overall profitability of the CPSEs. It further indicates that the rate of negative influence by the service sector is more than that of positive influence by the manufacturing sector. Thus, it reduces the overall profitability of the CPSEs at aggregate level.

Table 4: Regression Analysis for Sector-wise Influence of Investment Returns on Aggregate Investment Returns of the CPSEs during 2010-11 to 2019-20						
Sector	**R²**			**Regression Co-efficient (b)**		
	ROA	**ROCE**	**ROE**	**ROA**	**ROCE**	**ROE**
Manufacturing Sector	0.14	0.55	0.04	0.17 [i] (1.12)	0.20[**] (3.12)	-0.03 [i] (-0.54)
Service Sector	0.00	0.45	0.40	0.00 [i] (0.00)	-0.39[**] (-2.54)	-0.18 [i] (-2.30)

Figures in bracket indicate t-value.
[**] significant at 5% level (2-tailed).
[i] insignificant.

Source: Author's Calculation.

8.4 Results of the Conceptual Model: The results of the conceptual model based on the accepted hypotheses are shown below in Fig. 2:

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H$_1$

```
┌─────────────────────┐
│ 1) No Difference (ROCE │
│     and ROE).         │
│ 2) Difference (ROA).  │
└─────────────────────┘
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```
┌──────────────────┐      ┌──────────────────┐
│ Average          │      │ Average          │
│ Investment       │      │ Investment       │
│ Returns of       │      │ Returns of       │
│ Manufacturing    │      │ Service          │
│ Sector           │      │ Sector           │
└──────────────────┘      └──────────────────┘
```

H$_2$

```
┌──────────────────┐
│ 1) No Influence (ROA │
│     and ROE.         │
│ 2) Influence (ROCE). │
└──────────────────┘
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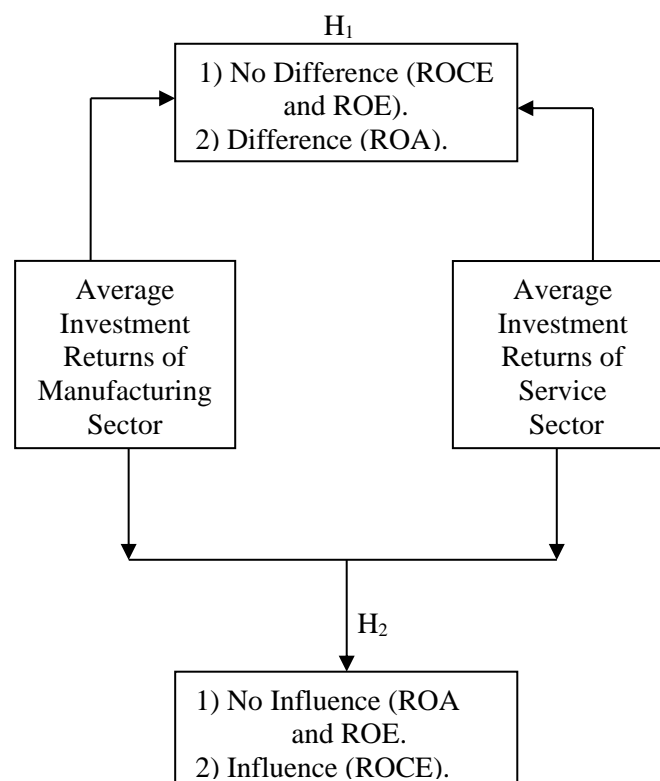
Fig. 2: Results of the Conceptual Model based on Accepted Hypotheses of the Study

9. CONCLUSIONS :

On the average, investment returns (except ROCE) of the manufacturing sector are higher than that of the service sector (although the result is significant for return on assets during the entire period). On the average, the manufacturing sector has recorded higher investment returns than that of the service sector in all the periods (except ROCE in the 2nd half). However, the result is statistically momentous for ROA only during the entire period. This shows that manufacturing sector has efficiently utilized their total assets in generating returns in comparison to the service sector.

Finally, aggregate ROCE (i.e., overall profitability) of the CPSEs is positively driven by ROCE of manufacturing sector, while ROCE of service sector negatively drives the aggregate ROCE of the CPSEs. On the whole, overall returns (i.e., aggregate ROCE) of the CPSEs have been negatively affected, since the rate of negative influence by the service sector is more than that of the positive influence by the manufacturing sector.

10. RECOMMENDATION :

On the average, the study reveals higher returns in the manufacturing sector as compared to the service sector. Moreover, investment returns of the aggregate CPSEs are positively driven by the investment returns of the manufacturing sector. Hence, the Government may invest more funds in the industries under manufacturing sector in order to achieve optimum utilization of resources.

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