BEHAVIOUR OF INVESTMENT RETURNS IN THE DISINVESTMENT ENVIRONMENT: THE CASE OF POWER INDUSTRY IN INDIAN CPSEs

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ABSTRACT

Investment return may be defined as a recital gauge through which profitability of an investment is evaluated. It helps to assess the effectiveness of dissimilar investments at a particular point of time. Hence, return on investment is an attempt to straightforwardly compute the income of a fastidious investment with respect to its investment cost. The CPSEs in India were set up to serve the extensive macro-economic objectives of fiscal augmentation, independence in manufacturing, surfeit equilibrium of payments, and managing the inflationary and deflationary situations. In the backdrop of our earlier research published in IJSSP, USA, vol.10, no.10, 2022, the present study is an attempt to assess the behavior of investment returns with a view to assess their impact in the disinvestment environment with reference to power industry in Indian CPSEs during 2010-11 to 2019-20. Overall, both the industries (i.e., power generation industry and power transmission industry) have generated optimistic earnings on their investment in all the years under cram. Thus, power industry notably drives the Indian economy. Though mean investment earnings of power generation industry have decreased marginally, there has been enhancement in mean investment earnings of power transmission industry in vocabulary of ROCE and ROE. For further enhancement in investment returns of power industry, steps should be taken to ensure best likely use of installed capacity, minimization of interest cost and effectual utilization of inner resources produced by the power industry. The study is based on secondary statistics at aggregate level. Besides, the study considered only accounting based measures of investment returns. Hence, future research may be carried out at micro level i.e., at company-wise level within each power industry in Indian CPSEs.

1. INTRODUCTION

Investment refers to an asset through which the price of currency grows over time. Thus, investment is the method of distributing money to generate revenue. The overall objectives of investment are conservation of capital, steady income, tax advantages, etc. The various objectives of investment are conservation of capital, steady returns, capital appreciation, tariff advantages, and accomplishment of economic goals. In this context, investment return may be defined as a recital gauge through which profitability of an investment is evaluated. It helps to assess the effectiveness of dissimilar investments at a particular point of time. Hence, return on investment is an attempt to straightforwardly compute the income of a fastidious investment with respect to its investment cost [1].

The Central Public Sector Enterprises (CPSEs) in India were set up to serve the extensive macro-economic objectives of fiscal augmentation, independence in manufacturing, surfeit equilibrium of payments, and managing the inflationary and deflationary situations [2]. The CPSEs are considered as a contrivance for change of the economic structure with impartiality and social righteousness. The CPSEs started their journey with a capital cost of Rs. 29 Cr. only, while the total capital costs of the CPSEs stood at Rs. 16,40,628 Cr. as on 31.12. 2019 [3]. The CPSEs act as tactical players towards the formation of an economy. They supply indispensable products and services as well as play a noteworthy role in essential sectors like petroleum, electricity, steel, mining, telecommunications, hospitality, etc [4]. The CPSEs were established with a view to reduce poverty, achieve self-sufficiency, employment augmentation, elimination of inequalities, etc [5]. But these goals could not be achieved up to the desired level. As a result, the Govt. of India initiated the process of disinvesting its equity shares in selected CPSEs from the year 1991-92 [6].

Disinvestment is the process in which Government's equity is withdrawn (either in portion or in totality). The basic rule of disinvestment is to boost capital, encourage civic participation on a wider basis and to achieve improved marketplace answerability [7]. Thus, disinvestment seeks to ensure optimal use of nationalized capital and to boost industrious effectiveness of the CPSEs [8].

2. THEORETICAL FRAMEWORK

CPSEs occupy a significant position and perform a crucial role in the development process of Indian economy. They are the assets of the nation. Furthermore, enormous funds are invested by the Government [9].

In this backdrop, our earlier research (published in IJSSP, online academic press, USA, vol.10, no.10, 2022), investigated the influence of industry-wise investment returns on the aggregate investment returns in Indian CPSEs. The study results indicated that among the selected industries, investment returns in power industry have foremost influence on aggregate investment returns of the CPSEs [10]. These empirical results inspire us to carry out further research on the behavior of investment returns with a view to assess their impact in the disinvestment environment with reference to power industry in Indian CPSEs [11].

2.1 Research Questions

In the context of rationale of the study, the subsequent pertinent research questions have emerged out to demeanor experiential research on the behavior of investment returns in the disinvestment backdrop with reference to power industry in Indian CPSEs [12] during the period under study:

How are the investment returns of power generation industry measured?

How the impact of investment returns in power generation industry is measured?

3. LITERATURE REVIEW

A moribund trend is found in investment of the CPSEs in the state of Kerala with a low use of capacity. The study revealed that by increasing capacity use, profitability could be improved. Overall, the study stated that reform measures that were adopted had brought preferred outcomes in the CPSEs [13]. To achieve efficiency, the study further recommended that privatization is a short-range measure rather than a lasting measure [14]. Privatization cannot be held responsible for the problems associated with transition process. Furthermore, fiscal recital indicated improvement in profitability and sales competency [11] and profitability recital had amplified by twenty four percent points. Further, profitability increased due to improvement in productivity [15]. The study further revealed that profitability was higher in competitive markets as compared to the non-competitive markets [10].

The CPSEs in India had recorded better performance in the post-reform phase as compared to the pre-reform phase in relation to sales, revenue, market capitalization, etc. The study further stated that in spite of desired results, more efforts are required to augment the

effectiveness of the CPSEs in India [16]. Monopoly firms were competent in profitability recital, while operating performance in respect of profitability and sales of the competitive firms had declined after the disinvestment stage [17].

Most of the recital indicators did not perform well after disinvestment. The reasons that could be ascribed towards the reduced recital were Govt. intervention in the functioning of the CPSEs, incompetent industrial composition, milieu limitations, and diminutive percentage of disinvestment [12]. Similarly, disinvestment had enhanced the profitability recital of the loss creation CPSEs. The investigator recommended that staff and civic of the profit creation CPSEs should be offered divested equity shares of the CPSEs [18].

Some recital indicators like net worth, EPS, debt, etc. showed meager performance, while some recital indicators like net profit, operational profit, etc. revealed better recital after disinvestment [19]. Overall, at least forty one percent of the sample selected in the study showed enhancement in monetary and operational recital during the study epoch [15] and the performance of the CPSEs in the sectors represented by mining, service, electricity, and manufacturing [20]. The study revealed momentous augment in the overall operational effectiveness in relation to sales and net income [21]. On the other hand, profitability recital showed unimportant results [8].

The collision of disinvestment on fiscal recital of the chosen Maharatna and Navratna companies. The study results showed that due to disinvestment, Maharatna companies had momentous collision, while no noteworthy collision was observed in the Navratna companies [16]. The profit velocity recital of the CPSEs at macro level [22]. The study found a decreasing trend in ROCE and RONW, although no considerable deviations were found between the trend values and real values of ROCE and RONW [23]. In the collision of disinvestment on the monetary performance of twenty CPSEs [24]. The study found positive collision on monetary recital of the Indian CPSEs in relation to dividend, value, liquidity, and size, while operational efficacy, leverage, and profitability of the CPSEs did not modify considerably [25].

3.1 Research Gap

From the findings of prior literature as stated above, the following research gaps are identified: No study is found with respect to investment takings of power industry (comprising of generation and transmission segment) in Indian CPSEs. No study is found to assess the impact of investment profits in power industry in Indian CPSEs.

3.2 Objectives

Against the backdrop of research gap, the primary objective of the study is to examine the investment returns of power industry in Indian CPSEs. To accomplish this major intent, the following resultant objectives are required to be achieved:

- To examine the behavior of investment returns based on investment ratios.
- To examine the impact of investment returns in the disinvestment ambiance.
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4. Methodology

The cram applied quantitative approach to assess the behavior of investment takings of power industry in Indian CPSEs. Hence, the study betrothed resultant pecuniary statistics which is gathered from obtainable yearly information of Public Enterprise Survey of Govt. of India [1]. In addition, aggregate data of both the industries (i.e., power generation industry and power transmission industry) are used in the cram to arrive at a significant conclusion [26]. The applicable data are collected, tabulated, and analyzed according to the requirements of the cram. Further, the outcomes are calculated through SPSS 19 version software package.

4.1. Research Model

The sample of our study comprises of power generation industry and power transmission industry in Indian CPSEs.
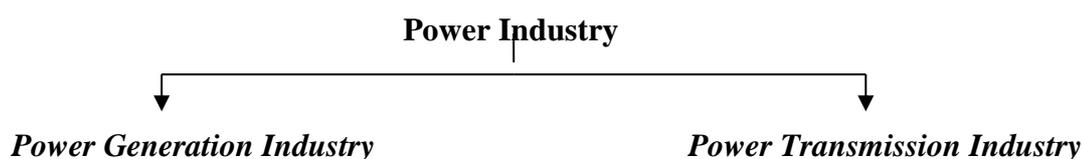
Power Industry

Power Generation Industry   *Power Transmission Industry*

Figure 1: Proposed Research Model

4.2. Variables Identification

A length of 10 years ranging from 2010-11 to 2019-20 forms the study phase of our research. The reason for selecting this specific time is because disinvestment in the Indian CPSEs took place on an unremitting annual basis. Further, the fiscal year 2020-21 has not been taken into consideration due to the consequence of Covid-19 pandemic and due to the non-availability of data [27]. To study the behavior of investment returns with a view to appraise their impact in power industry, the whole study period is broken down into two sub-periods, namely:

1st sub-period: 2010-11 to 2014-15, and 2nd sub-period: 2015-16 to 2019-20.

4.3. Research Hypothesis

In compliance with the research objective of the study, the research assumption is framed as follows:

H_0: There is no considerable change in the behavior of investment returns.

4.4. Research Methodology

Explanatory Statistics

To measure overtime changes and to make comparison between the two sub-periods, explanatory statistics that comprises of average, S.D., and Coefficient of Variation (C.V.) are applied in the study [28]. Further, to appraise the reliability of investment returns in power industry at aggregate level, it has been arbitrarily estranged into comparatively steady (C.V. $\leq$ 25%), fairly fluctuating (25.1% $\leq$ C.V. $\leq$ 50.0%), highly fluctuating (50.1% $\leq$ C.V. $\leq$ 75.0%), and intermittently fluctuating (C.V. > 75.0%) [14].

Accounting and Statistical Methods

Based on the past literatures reviewed above, the ratios that are selected in the study to examine and analyze investment returns of power industry in Indian CPSEs are outlined below [15] [16]:

ROA = Net Profit after Taxes ÷ Total Assets.

ROCE = EBIT ÷ Capital Employed.

ROE = Net Profit after Taxes ÷ Shareholders' Equity

To examine the behavior of investment returns with a view to assess their impact in power industry, paired 't' test is applied in the study. The paired 't' test is shown below [17]:

$$t = (\bar{d}) \div (s \div \sqrt{n-1})$$

Where: $\bar{d}$ = average and 's' = S.D. of the differences d_i i.e., $d = (\Sigma d_i \div n)$ and $s = \sqrt{\Sigma d_i^2 \div n - (\Sigma d_i \div n)^2}$.

The paired 't' statistic follows t distribution with $(n-1)$ d.f.

4. DATA ANALYSIS

Investment Returns of Power Generation Industry in Indian CPSEs

ROA: From Table 1 and Figure 1, it is observed that ROA of power generation industry varies from 0.04 to 0.06 with an average of 0.05 and C.V. at 20.00% (i.e., relatively stable) during the whole period. From the sub-period analysis, we found that average performance of ROA has decreased from 0.06 in the 1st half to 0.04 in the 2nd half. The ratio moves from 0.05

to 0.06 in the 1ˢᵗ half, while the same moves from 0.04 to 0.05 in the 2ⁿᵈ half. Both the sub-periods have shown relatively stable performance in ROA.

ROCE: Table 1 and Figure 1 further reveals that ROCE varies from 0.07 to 0.11 with an average of 0.09 and it is relatively stable (C.V. 11.11%) during the whole period. The average performance of ROCE has gone down from 0.10 in the 1ˢᵗ half to 0.08 in the 2ⁿᵈ half. The ratio ranges from 0.08 to 0.11 in the 1ˢᵗ half, while it ranges from 0.07 to 0.09 in the 2ⁿᵈ half. Both the halves have shown relatively stable performance in ROCE.

ROE: Finally, from Table 1 and Figure 1, it is observed that ROE of power generation industry in Indian CPSEs moves from 0.09 to 0.12 with an average of 0.10 and it is relatively stable (C.V. 10.00%) during the entire period. In terms of sub-period analysis, the average performance of ROE has marginally decreased from 0.11 in the 1ˢᵗ half to 0.10 in the 2ⁿᵈ half. ROE varies from 0.10 to 0.12 in the 1ˢᵗ half, while it varies from 0.09 to 0.10 in the 2ⁿᵈ half. A relatively stable performance has been observed during both halves of the study period.

Table 1: Investment Returns of Power Generation Industry in Indian CPSEs

| Years	ROA	ROCE	ROE
2010-11	0.06	0.10	0.11
2011-12	0.06	0.10	0.11
2012-13	0.06	0.11	0.12
2013-14	0.05	0.09	0.10
2014-15	0.05	0.08	0.10
2015-16	0.05	0.08	0.09
2016-17	0.05	0.08	0.10
2017-18	0.04	0.09	0.10
2018-19	0.04	0.07	0.10
2019-20	0.04	0.09	0.10
Whole Period:			
Average	0.05	0.09	0.10
S.D.	0.01	0.01	0.01
C.V.	20.00%	11.11%	10.00%
1ˢᵗ Sub-Period:			
Average	0.06	0.10	0.11
S.D.	0.01	0.01	0.01
C.V.	16.67%	10.00%	9.09%
2ⁿᵈ Sub-Period:			
Average	0.04	0.08	0.10
S.D.	0.01	0.01	0.01
C.V.	25.00%	12.50%	10.00%

Source: *Author's Calculation.*

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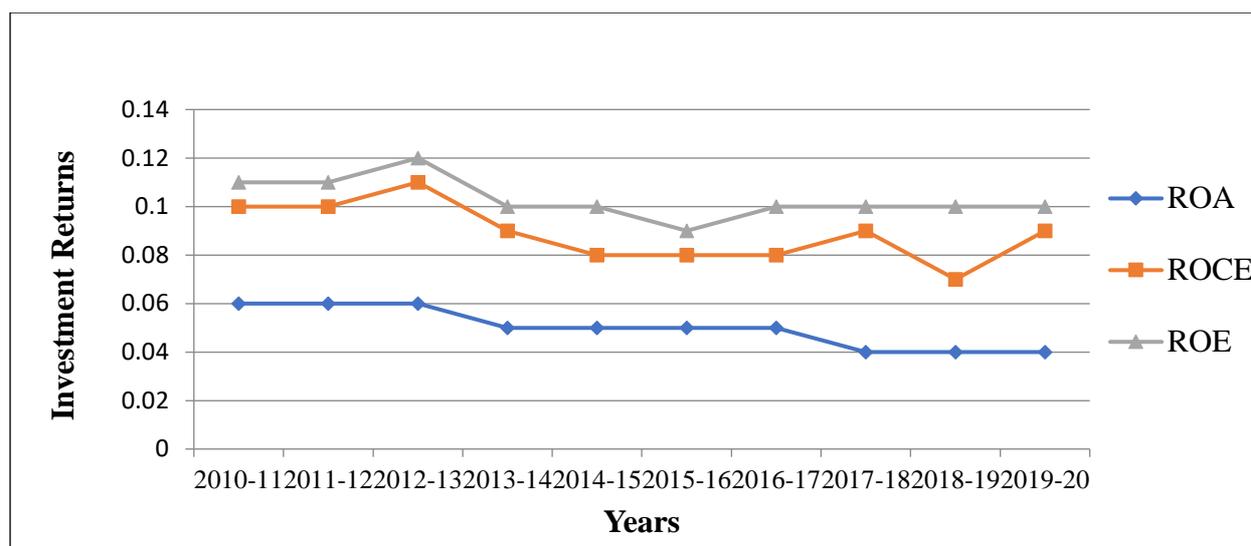
Figure 1: Investment Returns of Power Generation Industry

Paired 't' Test for Investment Returns in Power Generation Industry

Paired 't' test (Table 2) reveal significant result at 1% level for ROA (t = 6.00). However, we found insignificant results for ROCE (t = 2.33) and ROE (t = 2.24). The above analysis leads to the rejection of null supposition of the study for ROA. This indicates that average performance of ROA has significantly decreased (i.e., negative impact) during the study period. However, the same hypothesis (i.e., null supposition) has been accepted for ROCE and ROE.

Table 2: Paired 't' Test for Investment Returns in Power Generation Industry

Particulars	ROA	ROCE	ROE
Average (1st Sub-Period)	0.06	0.10	0.11
Average (2nd Sub-Period)	0.04	0.08	0.10
Calculated value of t	6.00[***]	2.33 [i]	2.24 [i]
Impact	Negative Impact	No Impact	No Impact

Notes:
[***] marked value indicates significant at 1% level (2-tailed).
[i] marked values indicate insignificant.
Source: Author's Calculation.

Investment Returns of Power Transmission Industry in Indian CPSEs

ROA: Table 3 and Figure 2 shows that ROA of power transmission industry in Indian CPSEs ranges from 0.03 to 0.04 with a C.V. at 25.00% (i.e., relatively stable performance) during the entire period. The whole period average is observed to be 0.04.

The average performance of ROA has remained same (i.e., 0.04) during both halves of the study [29]. In terms of movement of the ratio, it varies from 0.03 to 0.04 during both halves of the study. Further, ROA of PTI has remained relatively stable (i.e., 25.00%) during both the sub-periods.

ROCE: As observed from Table 3 and Figure 2, ROCE is relatively stable (C.V. 11.11%) and it varies from 0.08 to 0.10 during the entire period. The whole period average of ROCE is observed to be 0.09. From the sub-period analysis, we found that average investment returns in

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terms of ROCE have marginally improved from 0.08 the 1st sub-period to 0.09 in the 2nd sub-period. The ratio has remained constant at 0.08 in the 1st half, while the ratio varies from 0.08 to 0.10 in the 2nd half. A relatively stable performance (C.V. 11.11%) is observed in the 2nd half, while there has been no fluctuation (C.V. 0.00%) in the 1st half.

ROE: From Table 3 and Figure 2, we found that ROE varies from 0.13 to 0.17 with an average of 0.15 and C.V. at 13.33% (i.e., relatively stable) during the entire study period. In terms of sub-period analysis, the average performance of ROE has improved from 0.14 in the 1st half to 0.16 in the 2nd half. The ROE of PTI moves from 0.13 to 0.16 in the 1st half, while the same moves from 0.14 to 0.17 in the 2nd half. Both the sub-periods have shown relatively stable performance with respect to ROE.

Table 3: Investment Returns of Power Transmission Industry in Indian CPSEs

Years	ROA	ROCE	ROE
2010-11	0.04	0.08	0.13
2011-12	0.04	0.08	0.14
2012-13	0.04	0.08	0.16
2013-14	0.03	0.08	0.13
2014-15	0.03	0.08	0.13
2015-16	0.03	0.08	0.14
2016-17	0.04	0.09	0.15
2017-18	0.04	0.09	0.15
2018-19	0.04	0.10	0.17
2019-20	0.04	0.10	0.17
Whole Period:			
Average	0.04	0.09	0.15
S.D.	0.01	0.01	0.02
C.V.	25.00%	11.11%	13.33%
1st Sub-Period:			
Average	0.04	0.08	0.14
S.D.	0.01	0.00	0.01

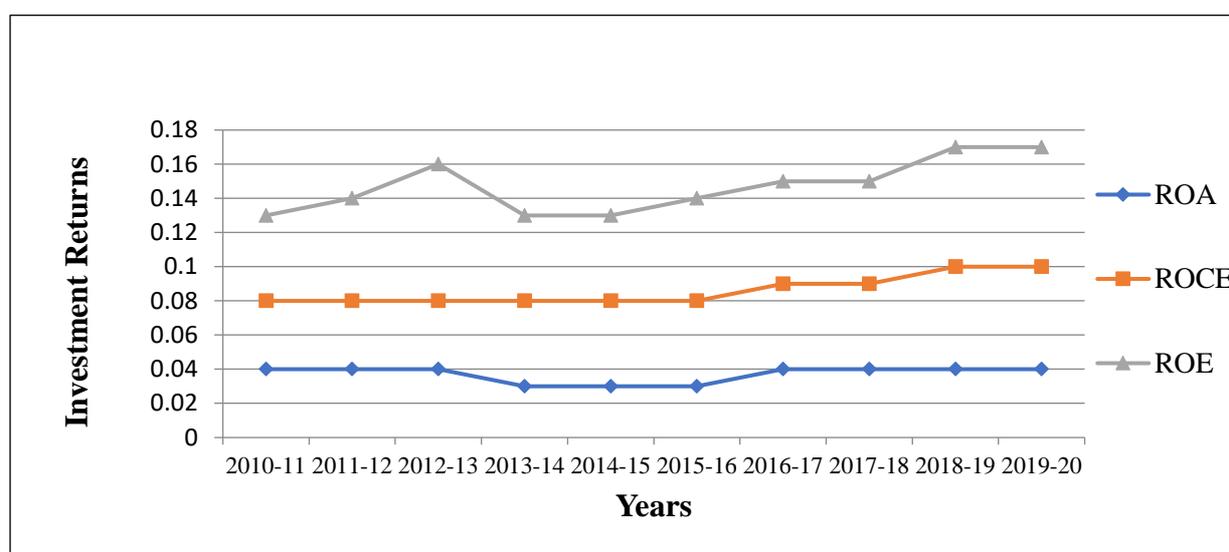| C.V.	25.00%	0.00%	7.14%
2nd Sub-Period:			
Average	0.04	0.09	0.16
S.D.	0.01	0.01	0.01
C.V.	25.00%	11.11%	6.25%

Source: Author's Calculation.

Figure 2: Investment Returns in Power Transmission Industry

Paired 't' Test for Investment Returns in Power Transmission Industry

Table 4 shows insignificant results for ROA (t = -0.54) and ROE (-1.86). However, ROCE (t = -3.21) shows significant result at 5% level of significance. The above analysis leads to the acceptance of null supposition of the study for ROA and ROE. For ROCE, the null supposition has been rejected in the study. This indicates that there has been significant improvement (i.e., positive impact) in the average performance of ROCE from 1st half to 2nd half of the study.

Table 4: Paired 't' Test for Investment Returns in Power Transmission Industry

Particulars	**ROA**	**ROCE**	**ROE**
Average (1st Sub-Period)	0.04	0.08	0.14
Average (2nd Sub-Period)	0.04	0.09	0.16
Calculated value of t	-0.54 [i]	-3.21 [**]	-1.86 [i]
Impact	No Impact	Positive Impact	No Impact

Notes:
[**] marked value indicates significant at 5% level (2-tailed).
[i] marked values indicate insignificant.

Source: Author's Calculation.

5. DISCUSSION ON RESULTS

The mean ROA of power generation industry is marginally higher as compared to the mean ROA of power transmission industry all through the entire stage. Sub-period investigation discloses no change in mean ROA for transmission industry [30], while the same decreases from first half to second half in power generation industry [31].

So far overall profitability (i.e., mean ROCE) is concerned, both the industries have parallel recital during the entire phase under study. However, sub-period examination discloses development in overall profitability recital by the power transmission industry, whereas power generation industry shows a decrease in profitability recital from first half to second half of the study [32]. In vocabulary of mean ROE, power transmission industry has elevated level of efficiency as compared to that of power generation industry throughout the entire epoch. Further, mean ROE examination between the two sub-periods discloses [33] an enhancement in power transmission industry, whereas the same decreases in power generation industry [34].

From the above discussion, it can be affirmed that there is an improvement in mean investment takings in power transmission industry (except ROA). On the other hand, power generation industry has exposed a moribund recital in mean investment profits throughout the epoch under study [35]. As a result, power transmission industry has brought optimistic outcomes in the disinvestment environment as compared to the power generation industry. The outcome of paired 't' test shows pessimistic impact in ROA of power generation industry, although power transmission industry shows affirmative impact in overall profitability (i.e., ROCE) [36]. Thus, it implies that power transmission industry has considerably enhanced their overall investment income [37], whereas return on assets in power generation industry has appreciably decreased in the disinvestment environment.

The above deliberations escort to the succeeding comments:

- Both power generation and power transmission industry generate positive takings on their investment.
- Both the industries reveal relatively stable recital in investment takings during the entire period and the two sub-periods of the cram.
- ROA of power generation industry shows pessimistic impact, although ROCE of power transmission industry disclose optimistic impact as indicated by paired 't' test. The remaining cases disclose immaterial outcomes.

6. CONCLUSION AND RECOMMENDATIONS

In finale, it may be concluded that both the industries (i.e., power generation industry and power transmission industry) have generated positive takings on their investment in all the years under cram. Accordingly, power industry considerably drives the Indian economy to a prime degree [38]. Though average investment profits of power generation industry have decreased marginally, there has been enhancement in average investment profits of power transmission industry in vocabulary of ROCE and ROE [39]. In terms of uniformity in investment profits, power industry in Indian CPSEs has shown relatively stable recital during all the periods under cram [40].

Though both the segments of power industry disclose affirmative profits in Indian CPSEs, the study has shown mixed impact in investment returns of power industry during the study epoch. Hence, further research is necessary at firm level to identify whether firm specific factors play an important role in determining their profitability performance. Further, to optimize investment profits in power industry, steps should be taken to guarantee best possible utilization of installed capacity, minimization of interest cost and effective use of internal funds fashioned by the power industry [41].

The findings of the study contribute theoretically and practically. Theoretically, the study contributes to the presented literature on investment income in Indian CPSEs. Moreover, findings of the cram will be helpful to the potential researchers for additional exploration. Practically, the behavior of investment income is assessed in power industry [42]. Hence, this cram might act as an indicator to the Government for framing suitable strategies to attain more growth [43]. In investment profits of power industry in Indian CPSEs by adopting necessary measures like best possible utilization of installed capability, minimization of interest cost requirement and effectual use of inner resources generated by the power industry. Further, it will help the Government to frame appropriate strategies related to divestment of their equity in the competitive liberal economic scenario [44]. The study is based on resultant data at aggregate echelon. Besides, the cram considered simply accounting based measures of investment profits. Moreover, margin ratios and market-based measures of profitability are not considered in this study. Hence additional research might be carried out with other important measures of profitability at micro level i.e., at company-wise level within each power industry in Indian CPSEs.

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