

Investment Return Trends of CPSEs in India: Empirical Evidence on Aggregation

^{1,2*}Dr. Sudipta Ghosh & ³Dr. P.S. Aithal

¹Post-Doctoral Research Fellow, Faculty of Management & Commerce, Srinivas University, Mangalore, Karnataka, India

²Assistant Professor, Dept. of Commerce (UG & PG), Prabhat Kumar College, Contai, Purba Medinipur, W.B., India

³Professor, Faculty of Management & Commerce, Srinivas University, Mangalore, Karnataka, India

Abstract

Background: Investment return is used to determine the efficiency of an investment. The efficacy of diverse investments can be evaluated at a specific time. Thus, investment return is an endeavour to directly calculate the return of a specific investment in relation to its price.

Objective: The study primarily aims to examine the investment return trends of the Indian CPSEs by investigating whether there is any deviation between actual values and estimated values of total returns on investment during 2010-11 to 2019-20.

Methodology: The deviations between actual values and estimated values of aggregate returns on investment have been tested by Chi-square test. In this respect, the estimated values of aggregate returns on investment are captured by applying the technique of linear regression equation.

Results: The findings of the study reveal mix trends in investment returns i.e., positive, negative and zero deviations. However, both positive and negative deviations are marginal during the study period.

Conclusion: At aggregate level, no considerable deviations are observed among actual and estimated investment returns in terms of investment ratios selected in the study.

Keywords: CPSEs, Deviations, Investment Returns, ROA, ROCE, ROE.

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*Author's Correspondence

 Dr. Sudipta Ghosh

 Post-Doctoral Research Fellow,
Faculty of Management &
Commerce, Srinivas University,
Mangalore, Karnataka, India
&
Assistant Professor, Dept. of
Commerce (UG & PG), Prabhat
Kumar College, Contai, W.B., India

 sgcostmanagement@gmail.com

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Introduction

Investment return is used to determine the efficiency of an investment in assets and equity. The efficacy of diverse investments can be evaluated at a specific time. Thus, investment return is an endeavor to directly calculate the return of a specific investment in relation to its price.

Practically, return on investment is measured in the following ways:

- **Return on Assets (ROA):** It indicates the return obtained from its total assets that are engaged in business.
- **Return on Capital Employed (ROCE):** It shows the returns from funds on a long term basis that are supplied by the owners and creditors.
- **Return on Equity (ROE):** It indicates the returns that are available to the equity shareholders.

Central Public Sector Enterprises (CPSEs) in India: A Brief Synopsis

The Indian Central Public Sector Enterprises were established to provide macro-economic goal of fiscal escalation, self-reliance in manufacturing, surplus BOP, and controlling price increasing and decreasing situations. The CPSEs are considered as an instrument for change of the economy with equality and community fairness.

CPSEs play a vital role towards growth of a country. CPSEs supply essential commodities and absorb a notable marketplace in essential segments of the economy.

Objective

The study primarily aims to examine the investment return trends of the Indian CPSEs by investigating whether there is any deviation between actual values and estimated values of total returns on investment.

Hypothesis

In terms of study objective, H_0 and H_A has been framed as follows:

Null Hypothesis (H_0): There are no considerable deviations among actual and estimated investment returns.

Alternative Hypothesis (H_A): There are considerable deviations among actual and estimated investment returns.

Research Design

Sample: All the CPSEs that are functioning in India form the sample of our study. However, the sample excludes community organizations that are run by departments, indemnity business as well as banking companies.

Research Episode: The research episode ranges from the financial year 2010-11 to the financial year 2019-20. Hence, the research episode is long enough that covers different stages of trade cycle.

Data Basis: Secondary data is used. The relevant data are sourced from the reports of the PES, Govt. of India.

Methodology for Data Analysis: The investment returns are measured by the conventional investment ratios i.e., ROA, ROCE, and ROE.

Chi-square (χ^2) Test: χ^2 experiment has been conducted to measure the deviations between actual values and estimated values of total returns on investment. The χ^2 experiment is shown below:

$$\text{Chi-square } (\chi^2) = \sum \{ (f_0 - fe)^2 \div (fe) \}$$

In this respect, estimated values of aggregate returns on investment are measured by applying linear regression equation. The linear regression equation is given below:

$$y = a + bt$$

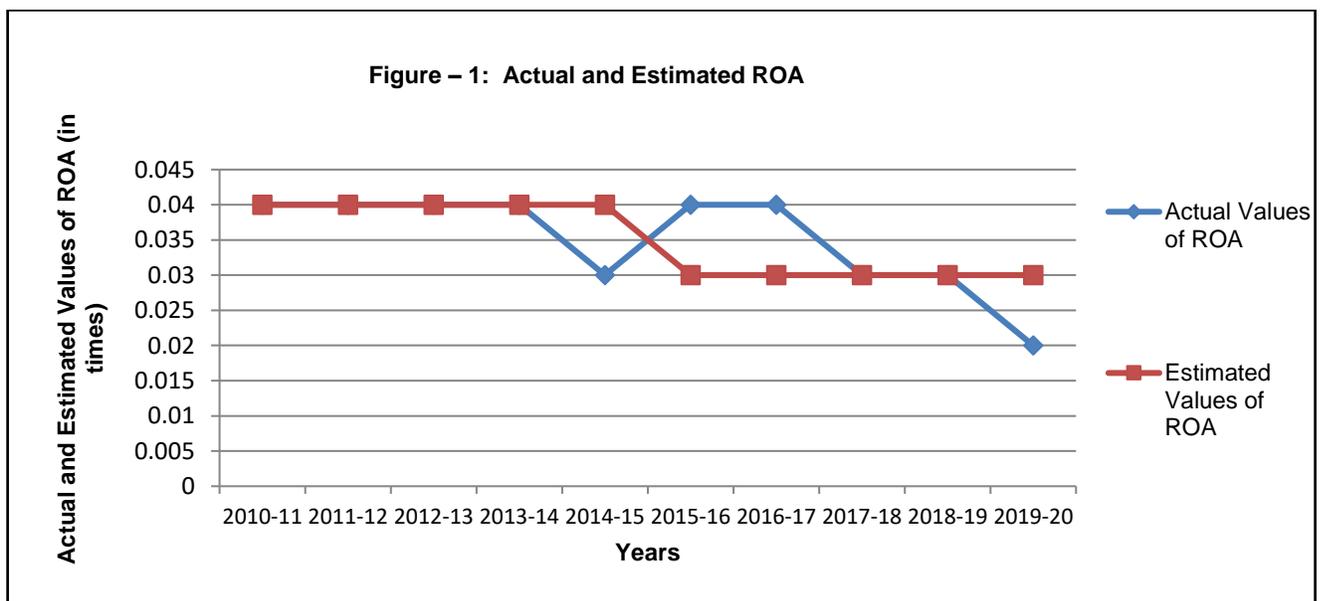
In this respect, y = returns on investment, a = intercept, b = regression coefficient, and t = time period.

Findings along with Analysis

Deviations between Actual Values and Estimated Values of ROA: Table – I and Figure – 1 reveals that there are no deviations between actual values and estimated values of aggregate investment returns (represented by ROA) in the years 2010-11, 2011-12, 2012-13, 2013-14, 2017-18, and 2018-19. Positive deviations are observed in the years 2015-16 and 2016-17, while negative deviations are observed in the years 2014-15 and 2019-20. However, both positive and negative deviations are marginal during the study period.

Table – I: Deviations between Actual and Estimated ROA			
Financial Years	(i)	(ii)	(i - ii)
	Actual ROA	Estimated ROA (ROA = 0.035 – 0.001t)	Deviations in ROA
2010-11	0.04	0.04	0.00
2011-12	0.04	0.04	0.00
2012-13	0.04	0.04	0.00
2013-14	0.04	0.04	0.00
2014-15	0.03	0.04	-0.01
2015-16	0.04	0.03	0.01
2016-17	0.04	0.03	0.01
2017-18	0.03	0.03	0.00
2018-19	0.03	0.03	0.00
2019-20	0.02	0.03	-0.01

Source: Author's Calculation.



χ^2 Experiment in terms of ROA: The χ^2 test (Table-II) shows that the observed value of χ^2 (0.01) is less than that of the tabulated value of χ^2 (19.02) at 9 degrees of freedom. This indicates that the deviations between actual values and estimated values of aggregate investment returns (represented by ROA) are not significant during the period under study. Thus, null assumption is accepted in the study.

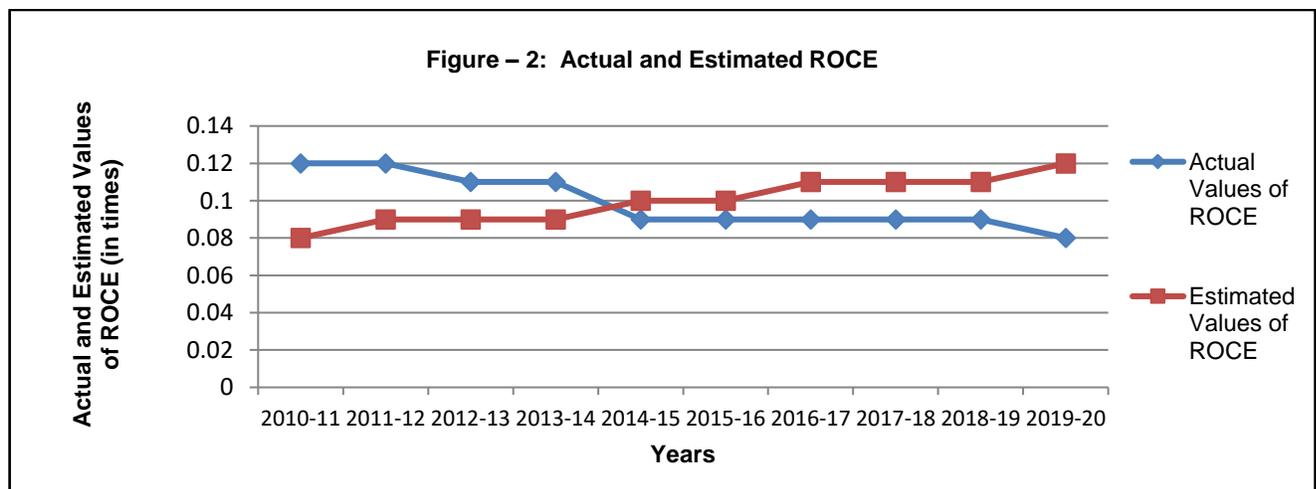
Table – II: Chi-square Test for Aggregate Investment Returns (represented by ROA) of the CPSEs during 2010-11 to 2019-20	
Degrees of Freedom (D.F.)	(10-1) = 9
Tabulated Value of χ^2 at 5% level	19.02
Observed Value of χ^2	0.01
Result	Insignificant

Source: Author's Calculation.

Deviations between Actual Values and Estimated Values of ROCE: Table – III and Figure – 2 shows positive deviations between actual values and estimated values of aggregate investment returns (represented by ROCE) from the years 2010-11 to 2013-14, while negative deviations of the same are observed from the years 2014-15 to 2019-20. The positive deviations as well as negative deviations are found to be marginal.

Table – III: Deviations between Actual and Estimated ROCE			
Financial Years	(i)	(ii)	(i – ii)
	Actual ROCE	Estimated ROCE (ROCE = 0.099 + 0.002t)	Deviations in ROCE
2010-11	0.12	0.08	0.04
2011-12	0.12	0.09	0.03
2012-13	0.11	0.09	0.02
2013-14	0.11	0.09	0.02
2014-15	0.09	0.10	-0.01
2015-16	0.09	0.10	-0.01
2016-17	0.09	0.11	-0.02
2017-18	0.09	0.11	-0.02
2018-19	0.09	0.11	-0.02
2019-20	0.08	0.12	-0.04

Source: Author's Calculation.

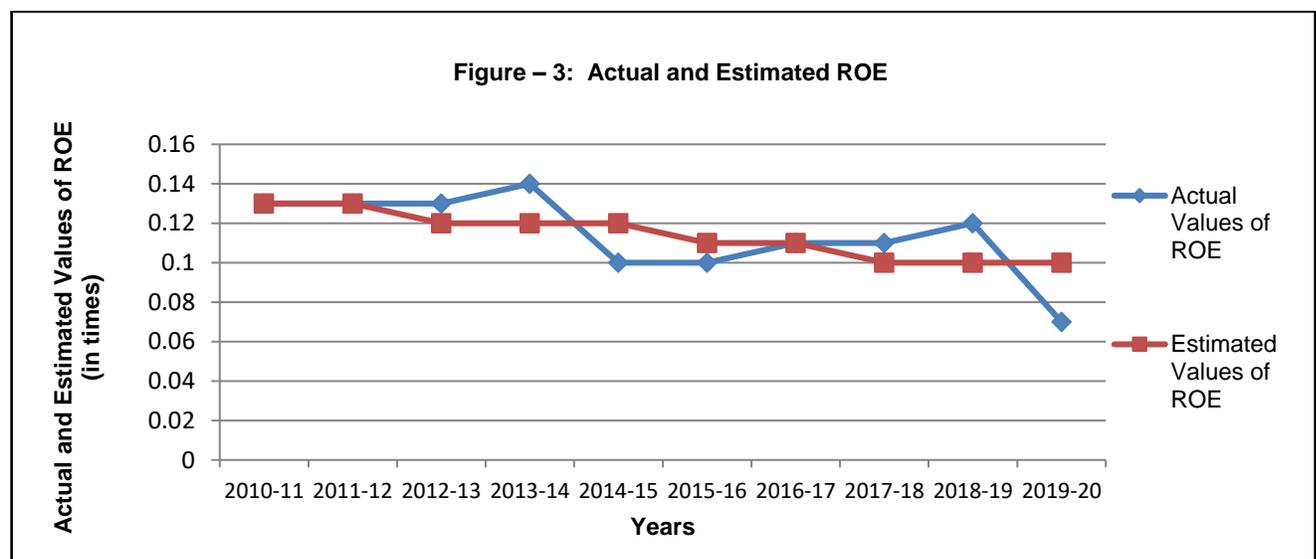


χ^2 Experiment in terms of ROCE: Table - IV shows that observed worth of χ^2 (0.06) is less as compared to tabulated worth of χ^2 (19.02) with 9 degrees of freedom. This is indicative of the fact that the deviations between actual values and estimated values of aggregate investment returns (represented by ROCE) are not statistically significant. Thus, null assumption is accepted in the study with respect to ROCE.

Table – IV: Chi-square Test for Aggregate Investment Returns (represented by ROCE) of the CPSEs during 2010-11 to 2019-20	
Degrees of Freedom (D.F.)	(10 – 1) = 9
Tabulated Value of χ^2 at 5% level	19.02
Observed Value of χ^2	0.06
Result	Insignificant
<i>Source: Author's Calculation.</i>	

Deviations between Actual Values and Estimated Values of ROE: Table – V and Figure – 3 reveals no deviations between actual values and estimated values of aggregate investment returns (represented by ROE) during the years 2010-11, 2011-12, and 2016-17. Positive deviations are observed in the years 2012-13, 2013-14, 2017-18, and 2018-19. On the other hand, negative deviations are observed in the years 2014-15, 2015-16, and 2019-20. Both the deviations (i.e., positive and negative) are found to be marginal during the study period.

Table – V: Deviations between Actual and Estimated ROE			
Financial Years	(i)	(ii)	(i – ii)
	Actual ROE	Estimated ROE (ROE = 0.114 - 0.002t)	Deviations in ROE
2010-11	0.13	0.13	0.00
2011-12	0.13	0.13	0.00
2012-13	0.13	0.12	0.01
2013-14	0.14	0.12	0.02
2014-15	0.10	0.12	-0.02
2015-16	0.10	0.11	-0.01
2016-17	0.11	0.11	0.00
2017-18	0.11	0.10	0.01
2018-19	0.12	0.10	0.02
2019-20	0.07	0.10	-0.03
<i>Source: Author's Calculation.</i>			



χ^2 Experiment in terms of ROE: The χ^2 experiment (Table - VI) indicates that the tabulated value of χ^2 (19.02) is greater than that of the observed value of χ^2 (0.02) at 9 degrees of freedom. This indicates that deviations between actual values and estimated values of aggregate investment return (represented by ROE) are insignificant. Thus, in terms of ROE, null assumption is accepted in the study.

Table – VI: Chi-square Test for Aggregate Investment Returns (represented by ROE) of the CPSEs during 2010-11 to 2019-20	
Degrees of Freedom (D.F.)	(10 – 1) = 9
Tabulated Value of χ^2 at 5% level	19.02
Observed Value of χ^2	0.02
Result	Insignificant
<i>Source: Author's Calculation.</i>	

Conclusions

The CPSEs reveal mix trends in investment returns i.e., positive, negative and zero deviations. However, positive and negative deviations in terms of investment ratios are marginal during the study period. Moreover, no considerable differences are observed among actual and estimated aggregate investment returns in terms of investment ratios selected in the study.

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