# CHAPTER- 7

# FINANCIAL PERFORMANCE OF EACH CATEGORY OF NBFCs- A COMPARATIVE ANALYSIS

***Chapter Outline:***

# Chapter – 7 Financial Performance of each Category of NBFCs- A Comparative Analysis

In this chapter, the performance assessment and growth rate based on selected parameters of investment companies and asset finance companies, known as Non-Banking Financial Companies (NBFCs), selected in the study, have been analyzed at aggregate level as well as at the individual company level.

To measure financial performance of selected NBFCs, the popular ratio analysis techniques have been applied in the study. From the review of empirical literatures as well as text books, the ratios widely used for assessment of financial performance of the companies are Gross Profit Ratio, Net Profit Ratio, Stock Turnover Ratio, Current Ratio, Quick Ratio, Return on Assets Ratios, Return on Capital Employed Ratio, Debt –Equity Ratio, Return on Equity, Interest Coverage Ratio, etc.

As the companies are NBFCs, no production activities are involved. Moreover, the profit and loss account mainly comprises of interest expenses and interest income. Hence, in our analysis, the following ratios have been purposely selected which are indicated below:

Return on Assets (ROA), Return on Capital Employed (ROCE), Return on Equity (ROE), Debt Equity Ratio (D/E Ratio), Net Profit Ratio (NPR) and Current Ratio (CR).

## 7.1 TREND GROWTH ANALYSIS

In this section, the trend growth analysis of the selected performance indicators of the NBFCs under consideration is made in order to understand how the NBFCs have performed over the selected time period in respect of the performance indicators.

To estimate trend growth rate of selected performance indicators, semi-log regression model is used in the study. The model gives the growth rates directly at different points of time.

Trend line equation is given by

$$\text{Log } Y = a + bt + Ut$$

where Y represents dependent variable, 'a' is a constant, 'b' represents growth rate, 't' represents time, and 'Ut' represents random disturbance term. In our study, the dependent variables are, namely, Return on Assets (ROA), Return on Capital Employed (ROCE), Return on Equity (ROE), Debt Equity Ratio (D/E Ratio), Net Profit Ratio (NPR), and Current Ratio (CR).

Now we present the trend growth rate of each performance indicator of selected investment companies at the aggregative level and also at individual company level.

### 7.1.1 TREND GROWTH RATES OF DIFFERENT RATIOS AS FINANCIAL PERFORMANCE INDICATOR OF SELECTED INVESTMENT COMPANIES (AGGREGATIVE AND COMPANY WISE)

**Table 7.1: Trend Growth Rates of Return on Assets (ROA) as Financial Performance Indicator of Selected Investment Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.365 | -0.455 (-3.498) | -10.1$^{i}$ (-2.005) | 4.020 | Negative and Insignificant |
| BACL | 0.116 | 0.142 (0.946) | -5.8$^{i}$ (-0.960) | 0.922 | Negative and Insignificant |
| SCL | 0.453 | 1.033 (8.781) | 11.0$^{**}$ (2.409) | 5.803 | Positive and Significant |
| LTIDPL | 0.172 | 0.003 (0.011) | -13.2$^{i}$ (-1.205) | 1.453 | Negative and Insignificant |
| REL | 0.056 | -0.795 (-2.759) | 7.2$^{i}$ (0.646) | 0.418 | Positive and Insignificant |
| ILFSL | 0.301 | -0.636 (-2.850) | -15.0$^{i}$ (-1.734) | 3.008 | Negative and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** a marked value indicates significant at 5% level (Two tailed)
iv. ***i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.1)***: From the above analysis, it is found that as many as three out of 5 companies have registered negative growth rate in ROA, but, however, they are statistically insignificant at 5% probability level and growth rates of the other two companies are positive, of which one is statistically significant at 5% probability level and the other is not statistically significant at even 5% probability level. ROA measures the profitability of the total funds invested in fixed assets. In case of NBFCs, the quantum of investment in fixed assets is comparatively very small. However, as the amount of fixed assets have some

relationship with output of the companies, its growth over time matters to the company concerned. However, the results presented in Table 7.1 do not indicate anything satisfying in terms of ROA.

Table 7.2 below presents the growth rate analysis for 'Return on Capital Employed' of the sample investment companies.

**Table 7.2: Trend Growth Rates of Return on Capital Employed (ROCE) as Financial Performance Indicator of Selected Investment Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.035 | -1.593 (-38.453) | -0.8$^{i}$ (-0.506) | 0.256 | Negative and Insignificant |
| BACL | 0.079 | -1.250 (-16.904) | -2.2$^{i}$ (-0.775) | 0.601 | Negative and Insignificant |
| SCL | 0.291 | -1.445 (-33.907) | 2.8$^{i}$ (1.693) | 2.866 | Positive and Insignificant |
| LTIDPL | 0.026 | -1.906 (-7.525) | -4.2$^{i}$ (-0.430) | 0.185 | Negative and Insignificant |
| REL | 0.014 | -1.154 (-2.903) | 4.8$^{i}$ (0.315) | 0.099 | Positive and Insignificant |
| ILFSL | 0.177 | -1.628 (-16.392) | -4.7$^{i}$ (-1.227) | 1.506 | Negative and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** ~~a~~ marked value indicates significant at 5% level (Two tailed)
iv***. i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.2)***: From the above results, it appears that the growth rates of ROCE of three companies are negative and statistically insignificant at 5% level of significance. For two other companies, growth rates are positive but statistically insignificant 5% level of significance. ROCE expresses the profitability in relation to the funds supplied by the stakeholders and owners taken

together. In this context, the situation is not at all favorable and the most challenging fact is that the aggregate growth rate of ROCE for all the sample investment companies taken together is positive but statistically insignificant 5% level of significance.

Next Table (7.3) shows the analysis of 'Return on Owner's Equity'.

**Table 7.3: Trend Growth Rates of Return on Owner's Equity (ROE) as Financial Performance Indicator of Selected Investment Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.349 | -0.983 (-34.036) | -2.2$^{i}$ (-1.938) | 3.755 | Negative and Insignificant |
| BACL | 0.138 | -1.095 (17.042) | -2.6$^{i}$ (-1.059) | 1.121 | Negative and Insignificant |
| SCL | 0.791 | -0.677 (-37.446) | -3.6$^{***}$ (-5.154) | 26.567 | Negative and Significant |
| LTIDPL | 0.025 | -1.863 (-7.380) | -4.1$^{i}$ (-0.422) | 0.178 | Negative and Insignificant |
| REL | 0.024 | -0.894 (-2.858) | 5.0$^{i}$ (0.410) | 0.168 | Positive and Insignificant |
| ILFSL | 0.055 | -1.090 (-18.657) | 1.4$^{i}$ (0.640) | 0.409 | Positive and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** ~~a~~ marked value indicates significant at 5% level (Two tailed)
iv***. i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.3)***: From the above empirical results, it is observed that two companies registered negative growth rates while other two companies have recorded positive growth rates and in all these four cases, the results are statistically insignificant. Only one company has recorded negative growth rate which is statistically significant. ROE shows how profitably the owners fund has been

utilized by the companies. In this respect, the situation is not at all satisfying. Aggregate growth rate of ROE for all the sample investment companies taken together is negative though it is statistically insignificant at 5% probability level.

Trend growth rate analysis of Debt-Equity ratio of the sample investment companies is shown in Table 7.4.

**Table 7.4: Trend Growth Rates of Debt-Equity Ratio (DER) as Financial Performance Indicator of Selected Investment Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.150 | 0.483 (11.490) | -1.8$^{i}$ (-1.113) | 1.240 | Negative and Insignificant |
| BACL | 0.143 | -0.375 (-10.319) | -1.5$^{i}$ (-1.081) | 1.169 | Negative and Insignificant |
| SCL | 0.798 | 0.677 (18.044) | -7.6$^{***}$ (-5.264) | 27.714 | Negative and Significant |
| LTIDPL | 0.003 | -1.167 (-6.251) | 1.1$^{i}$ (0.153) | 0.023 | Positive and Insignificant |
| REL | 0.184 | 0.309 (8.687) | 1.7$^{i}$ (1.257) | 1.579 | Positive and Insignificant |
| ILFSL | 0.699 | 0.370 (7.003) | 8.2$^{***}$ (4.030) | 16.239 | Positive and Significant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** marked value indicates significant at 5% level (Two tailed)
iv. ***i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.4)***: From the above analysis, it is observed that the growth rates of DER for three companies are positive out of which two are statistically insignificant at 5% probability level. Two companies have registered negative growth rates, out of which the result of one company is statistically significant at 1% probability level. DER shows the efficiency in managing the owners' fund and external funds and in this respect, the situation is not desirable.

The aggregate growth rate of DER for all the sample investment companies taken together is negative and it is statistically insignificant at 5% probability level.

Below is presented in Table 7.5, the growth rate analysis of Net Profit Ratio of sample investment companies.

**Table 7.5: Trend Growth Rates of Net Profit Ratio (NPR) as Financial Performance Indicator of Selected Investment Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.356 | -0.913 (-24.523) | -2.8$^{i}$ (-1.966) | 3.866 | Negative and Insignificant |
| BACL | 0.571 | -0.213 (-7.476) | -3.4$^{**}$ (-3.054) | 9.327 | Negative and Significant |
| SCL | 0.009 | -0.742 (-30.223) | -0.2$^{i}$ (-0.249) | 0.062 | Negative and Insignificant |
| LTIDPL | 0.415 | -0.674 (-5.166) | -11.3$^{i}$ (-2.227) | 4.959 | Negative and Insignificant |
| REL | 0.033 | -0.917 (-2.829) | 6.1$^{i}$ (0.487) | 0.238 | Positive and Insignificant |
| ILFSL | 0.270 | -0.868 (-7.862) | 6.9$^{i}$ (1.611) | 2.595 | Positive and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** marked value indicates significant at 5% level (Two tailed)
iv. ***i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.5)***: The results noted above show that the growth rate of NPR is negative for three companies but only one of them is statistically significant. Two companies have registered positive growth rates which are statistically insignificant. The NPR indicates management's ability to operate the business with cost effective manner. Accordingly, the situation does not appear to be desirable for all the sample companies. Even some threats are also observed in terms

of the negative growth rates for some companies but the most alarming fact is that the aggregate growth rate of NPR for all the sample investment companies taken together is negative and statistically insignificant at 5% probability level.

Table 7.6 shows the trend growth analysis of Current Ratio of the sample companies.

**Table 7.6: Trend Growth Rates of Current Ratio (CR) as Financial Performance Indicator of Selected Investment Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.780 | 0.312 (6.696) | -9.0*** (-4.986) | 24.861 | Negative and Significant |
| BACL | 0.596 | 0.083 (0.846) | -12.2** (-3.213) | 10.322 | Negative and Significant |
| SCL | 0.891 | 0.529 (11.265) | -13.7*** (-7.562) | 57.182 | Negative and Significant |
| LTIDPL | 0.022 | -0.123 (-0.545) | 3.5*i* (0.400) | 0.160 | Positive and Insignificant |
| REL | 0.162 | 0.176 (1.660) | -4.8*i* (-1.163) | 1.353 | Negative and Insignificant |
| ILFSL | 0.933 | -0.450 (-18.186) | 9.4*** (9.834) | 96.712 | Positive and Significant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** marked value indicates significant at 5% level (Two tailed)
iv. ***i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.6)***: From the above analysis, it is observed that the growth rate of CR is negative for three companies which are statistically significant at 5% probability level for two companies and not significant at 5% probability level for one company. The growth rates of CR are found to positive for two companies which are statistically significant for one company and statistically

not significant for the other company.CR measures short term solvency and indicate ability to meet short term obligations. In this context, the situation is not satisfying as is evident from the analysis of growth rates of individual companies. The aggregate growth of CR for all the sample investment companies taken together is negative and statistically significant at 1% probability level.

Now we present the trend growth rate of each performance indicator of selected asset finance companies at aggregative level and at individual company level.

### 7.1.2 TREND GROWTH RATES OF DIFFERENT RATIOS AS FINANCIAL PERFORMANCE INDICATOR OF SELECTED ASSET FINANCE COMPANIES (AGGREGATIVE AND COMPANY WISE)

Presented below in Table 7.7 is the growth rate analysis of Return on Assets of Asset Finance Companies.

**Table 7.7: Trend Growth Rates of Return on Assets (ROA) as Financial Performance Indicator of Asset Finance Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.368 | -0.005 (-0.115) | 3.7*i* (2.020) | 4.082 | Positive and Insignificant |
| SEFL | 0.536 | -0.848 (-14.482) | -8.9** (-2.841) | 8.071 | Negative and Significant |
| MFL | 0.869 | -0.399 (-10.292) | 10.2*** (6.815) | 46.445 | Positive and Significant |
| SCUFL | 0.493 | 0.627 (7.370) | 8.6** (2.609) | 6.805 | Positive and Significant |
| SFL | 0.00 | -0.695 (-14.387) | 0.1*i* (0.053) | 0.003 | Positive and Insignificant |
| DFL | 0.001 | 0.585 (18.783) | 0.1*i* (0.094) | 0.009 | Positive and Insignificant |
| IFL | 0.900 | 0.132 (2.899) | 14.0*** (7.492) | 63.081 | Positive and Significant |
| GFL | 0.560 | -0.723 (-9.603) | 8.7** (2.987) | 8.923 | Positive and Significant |
| MMFSL | 0.721 | 0.810 (55.327) | 2.4*** (4.252) | 18.083 | Positive and Significant |
| LTFL | 0.843 | -0.354 (-11.405) | 7.4*** (6.139) | 37.685 | Positive and Significant |
| STFCL | 0.341 | 0.984 (6.913) | 10.5*i* (1.903) | 3.622 | Positive and Insignificant |
| CFL | 0.938 | 0.312 (12.633) | 9.8*** (10.265) | 105.374 | Positive and Significant |
| ICL | 0.001 | 0.449 (5.760) | -0.3*i* (-0.102) | 0.010 | Negative and Insignificant |
| CIFCL | 0.935 | 0.345 (10.532) | 12.7*** (10.033) | 100.660 | Positive and Significant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form.

ii. *** marked value indicates significant at 1% level (Two tailed)

iii. ** marked value indicates significant at 5% level (Two tailed)

iv. ***i*** marked value indicates insignificant

v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.7)***:

From the above analysis of the results, it is found that growth rates of ROA of eleven companies are positive, out of which growth rates of eight companies are statistically significant either at 1% or 5% probability level and growth rates of three remaining companies are statistically insignificant at 5% probability level. Two companies have negative growth rates, one of which has experienced statistically significant growth while for the other, it was statistically insignificant, both at 5% probability levels. ROA measures the profitability of the total funds invested in fixed assets. In case of NBFCs. though the quantum of fixed assets is relatively small, a minimum growth is desirable; but it did not happen. So, here the situation is not satisfactory; rather it is highly discouraging. However, the aggregate growth rate of ROA for the entire sample of asset finance companies taken together is positive, though statistically insignificant at 5% probability level.

Following Table (7.8) presents the trend growth analysis of 'Return on Capital Employed' of Asset Finance Companies.

**Table 7.8: Trend Growth Rates of Return on Capital Employed (ROCE) as Financial Performance Indicator of Asset Finance Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.514 | -1.546 (-47.403) | 3.4** (2.720) | 7.401 | Positive and Significant |
| SEFL | 0.576 | -1.810 (-56.734) | -3.8** (-3.086) | 9.522 | Negative and Significant |
| MFL | 0.202 | -1.587 (-24.994) | 3.3*i* (1.331) | 1.771 | Positive and Insignificant |
| SCUFL | 0.764 | -1.456 (-76.379) | 3.5*** (4.759) | 22.651 | Positive and Significant |
| SFL | 0.565 | -1.557 (-19.226) | 9.5** (3.015) | 9.088 | Positive and Significant |
| DFL | 0.277 | -1.046 (-48.856) | -1.4*i* (-1.636) | 2.675 | Negative and Insignificant |
| IFL | 0.265 | -1.147 (-32.637) | 2.2*i* (1.590) | 2.527 | Positive and Insignificant |
| GFL | 0.659 | -1.592 (-35.210) | 6.4*** (3.675) | 13.507 | Positive and Significant |
| MMFSL | 0.453 | -1.417 (-46.912) | 2.8** (2.407) | 5.792 | Positive and Significant |
| LTFL | 0.076 | -1.638 (-68.832) | 0.7*i* (0.757) | 0.572 | Positive and Insignificant |
| STFCL | 0.240 | -1.492 (-21.722) | 4.0*i* (1.488) | 2.215 | Positive and Insignificant |
| CFL | 0.807 | -1.085 (-21.554) | 10.5*** (5.406) | 29.222 | Positive and Significant |
| ICL | 0.103 | -1.536 (-22.740) | 2.3*i* (0.897) | 0.804 | Positive and Insignificant |
| CIFCL | 0.008 | -1.611 (-6.954) | 2.1*i* (0.232) | 0.054 | Positive and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form

ii. *** marked value indicates significant at 1% level (Two tailed)

iii. ** marked value indicates significant at 5% level (Two tailed)

iv. ***i*** marked value indicates insignificant

v. Figures in bracket indicate 't' value

vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.8)***: From the above analysis, it is found that the growth rates of ROCE of 11 (eleven) companies are positive and out of these companies, the growth rates of five companies are statistically significant. Only two companies have registered negative growth rates but the growth rate of one of the companies is statistically insignificant at 5% probability level. ROCE expresses the profitability in relation to the funds supplied by the stakeholders and owners taken together. However, in general, the aggregate growth rate of ROCE for all the sample asset finance companies taken together is negative and statistically significant at 5% probability level.

Table 7.9 below presents the trend growth rate analysis of 'Return on Owner's Equity' of the sample Asset Finance Companies.

**Table 7.9: Trend Growth Rates of Return on Owner's Equity (ROE) as Financial Performance Indicator of Asset Finance Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.198 | -0.822 (-44.066) | -0.9$^{i}$ (-1.315) | 1.728 | Negative and Insignificant |
| SEFL | 0.774 | -1.126 (-24.985) | -8.5$^{***}$ (-4.894) | 23.955 | Negative and Significant |
| MFL | 0.040 | 0.978 (-21.904) | -0.9$^{i}$ (-0.543) | 0.295 | Negative and Insignificant |
| SCUFL | 0.017 | -0.743 (-33.504) | -0.3$^{i}$ (-0.344) | 0.118 | Negative and Insignificant |
| SFL | 0.834 | -1.093 (-78.226) | 3.2$^{***}$ (5.926) | 35.118 | Positive and Significant |
| DFL | 0.374 | 0.845 (-33.103) | -2.0$^{i}$ (-2.046) | 4.185 | Negative and Insignificant |
| IFL | 0.036 | -0.883 (-30.834) | -0.6$^{i}$ (-0.509) | 0.259 | Negative and Insignificant |
| GFL | 0.618 | -1.502 (-31.890) | 6.1$^{**}$ (3.364) | 11.314 | Positive and Significant |
| MMFSL | 0.088 | -0.754 (-32.521) | 0.7$^{i}$ (0.821) | 0.674 | Positive and Insignificant |
| LTFL | 0.690 | -0.916 (-49.619) | -2.8$^{***}$ (-3.949) | 15.596 | Negative and Significant |
| STFCL | 0.098 | -0.731 (-15.979) | -1.5$^{i}$ (-0.871) | 0.759 | Negative and Insignificant |
| CFL | 0.774 | -0.927 (-36.499) | 4.8$^{***}$ (4.897) | 23.976 | Positive and Significant |
| ICL | 0.328 | -0.987 (-21.166) | -3.3$^{i}$ (-1.847) | 3.412 | Negative and Insignificant |
| CIFCL | 0.001 | -0.858 (-6.928) | 0.3$^{i}$ (0.066) | 0.004 | Positive and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form

ii. *** marked value indicates significant at 1% level (Two tailed)

iii. ** marked value indicates significant at 5% level (Two tailed)

iv. ***i*** marked value indicates insignificant

v. Figures in bracket indicate 't' value

vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.9)***:

From the above empirical results, it is observed that eight companies experienced negative growth rates in ROE, out of which growth rates of ROE for 2 companies had been statistically significant. Five companies registered positive growth rates in ROE, out of which the results are statistically significant for three companies only. ROE shows how efficiently the owners' fund has been utilized by the companies. Considering the average annual growth rate of ROE for the maximum number of companies and that of all the companies taken together, which are negative though not significant at 5% probability level, it may be concluded that the companies' performance in respect of ROE was not at all satisfactory.

Table 7.10 presents the trend growth analysis of 'Debt-Equity Ratio' of the selected Asset Finance Companies.

**Table 7.10: Trend Growth Rates of Debt-Equity Ratio (DER) as Financial Performance Indicator of Asset Finance Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.847 | 0.629 (28.250) | -5.4*** (-6.215) | 38.622 | Negative and Significant |
| SEFL | 0.758 | 0.575 (17.708) | -5.9*** (-4.686) | 21.960 | Negative and Significant |
| MFL | 0.353 | 0.469 (6.390) | -5.6*i* (-1.955) | 3.823 | Negative and Insignificant |
| SCUFL | 0.677 | 0.614 (18.825) | -4.8*** (-3.834) | 14.698 | Negative and Significant |
| SFL | 0.277 | 0.176 (1.096) | -10.2*i* (-1.638) | 2.684 | Negative and Insignificant |
| DFL | 0.649 | -0.235 (-17.423) | -1.9*** (-3.597) | 12.935 | Negative and Significant |
| IFL | 0.349 | -0.124 (-1.476) | -6.3*i* (-1.938) | 3.757 | Negative and Insignificant |
| GFL | 0.180 | -0.658 (-13.203) | -2.4*i* (-1.241) | 1.540 | Negative and Insignificant |
| MMFSL | 0.478 | 0.555 (21.090) | -2.6** (-2.534) | 6.422 | Negative and Significant |
| LTFL | 0.773 | 0.628 (27.467) | -4.3*** (-4.882) | 23.831 | Negative and Significant |
| STFCL | 0.716 | 0.670 (16.597) | -6.6*** (-4.201) | 17.649 | Negative and Significant |
| CFL | 0.121 | -0.568 (-1.713) | -12.6*i* (-0.982) | 0.964 | Negative and Insignificant |
| ICL | 0.729 | 0.386 (8.211) | -7.9*** (-4.337) | 18.810 | Negative and Significant |
| CIFCL | 0.945 | 0.788 (59.216) | -5.7*** (-10.980) | 120.561 | Negative and Significant |

***Source: Computed***

Notes:

i. The trend co-efficient (i.e. beta coefficient represented by 'b') has been multiplied by 100 to express the growth rate in percentage form

ii. *** marked value indicates significant at 1% level (Two tailed)

iii. ** ~~a~~ marked value indicates significant at 5% level (Two tailed)

iv***. i*** marked value indicates insignificant

v. Figures in bracket indicate 't' value

vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.10)***: From the above results, it is observed that the growth rates of DER for all the sample companies are negative and these are statistically significant at 5% probability level except for five companies. DER shows the efficiency in managing the owners' fund and external funds. In this context, the situation in respect of individual companies appears to be satisfactory. However, considering all the sample companies together, the aggregate growth rate of DER is found to be negative and statistically significant at 5% probability level. The results mean that either debt (D) has fallen over time, or equity (E) has gone up over time implying thereby that 'E' has played more important role in relation to 'D' in the financing of the companies' projects during the period under study, thereby cutting down the financing risk of the companies considered.

Trend Growth analysis of Net Profit Ratio of the sample Asset Finance Companies is shown in Table 7.11 below.

**Table 7.11: Trend Growth Rates of Net Profit Ratio (NPR) as Financial Performance Indicator of Asset Finance Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.035 | -0.838 (-35.026) | -0.5$^{i}$ (-0.505) | 0.255 | Negative and Insignificant |
| SEFL | 0.841 | -1.040 (-27.766) | -8.8$^{***}$ (-6.091) | 37.106 | Negative and Significant |
| MFL | 0.155 | -1.049 (-29.715) | -1.6$^{i}$ (-1.134) | 1.286 | Negative and Insignificant |
| SCUFL | 0.139 | -0.809 (-48.092) | 0.7$^{i}$ (1.061) | 1.126 | Positive and Insignificant |
| SFL | 0.449 | -1.036 (-64.609) | 1.5$^{**}$ (2.388) | 5.702 | Positive and Significant |
| DFL | 0.151 | -0.607 (-25.884) | -1.0$^{i}$ (-1.115) | 1.242 | Negative and Insignificant |
| IFL | 0.644 | -0.647 (-24.121) | -3.7$^{***}$ (-3.561) | 12.679 | Negative and Significant |
| GFL | 0.475 | -0.960 (-25.657) | 3.6$^{***}$ (-3.561) | 6.338 | Positive and Significant |
| MMFSL | 0.065 | -0.730 (-24.113) | 0.8$^{i}$ (0.695) | 0.483 | Positive and Insignificant |
| LTFL | 0.727 | -0.870 (-33.603) | -4.3$^{***}$ (-4.312) | 18.595 | Negative and Significant |
| STFCL | 0.000 | -0.769 (-21.292) | -0.1$^{i}$ (-0.040) | 0.002 | Negative and Insignificant |
| CFL | 0.894 | -0.633 (-33.438) | 5.6$^{***}$ (7.668) | 58.798 | Positive and Significant |
| ICL | 0.533 | -0.942 (-25.548) | -4.0$^{**}$ (-2.826) | 7.987 | Negative and Significant |
| CIFCL | 0.004 | -0.971 (-6.960) | 0.9$^{i}$ (0.175) | 0.031 | Positive and Insignificant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form

ii. *** marked value indicates significant at 1% level (Two tailed)

iii. ** ~~a~~ marked value indicates significant at 5% level (Two tailed)

iv***. i*** marked value indicates insignificant

v. Figures in bracket indicate 't' value

vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.11)***:

From the above analysis, it is observed that the growth rates of NPR of seven companies are negative and the growth rates of only four out of these seven companies are statistically significant. Six companies registered positive growth rates and out of which growth rates of only three companies are statistically significant. The NPR is indicative of management's ability to operate the business with cost effective manner. In this case, the situation is not encouraging for all the sample companies. However, even though some companies have registered positive growth rates, the aggregate growth rate of NPR for all the sample asset finance companies taken together is negative and it is statistically insignificant at 5% probability level.

Trend Growth analysis of Current Ratio of the sample Asset Finance Companies is presented below in the Table 7.12

**Table 7.12: Trend Growth Rates of Current Ratio (CR) as Financial Performance Indicator of Asset Finance Companies**

| Companies | $R^2$ | Constant (a) | Growth Rate (%) | F Value | Comments |
|---|---|---|---|---|---|
| Aggregate ( All Sample Companies taken together) | 0.846 | 0.296 (8.705) | -8.2*** (-6.204) | 38.484 | Negative and Significant |
| SEFL | 0.889 | 0.537 (7.446) | -20.9*** (-7.478) | 55.920 | Negative and Significant |
| MFL | 0.253 | -0.050 (-0.663) | -4.5*i* (-1.538) | 2.365 | Negative and Insignificant |
| SCUFL | 0.008 | 0.358 (7.616) | 0.4*i* (0.245) | 0.060 | Positive and Insignificant |
| SFL | 0.550 | -0.474 (-3.867) | -13.9** (-2.927) | 8.568 | Negative and Significant |
| DFL | 0.606 | 0.369 (39.908) | 1.2** (3.283) | 10.775 | Positive and Significant |
| IFL | 0.337 | -0.012 (-0.291) | -3.1*i* (-1.888) | 3.565 | Negative and Insignificant |
| GFL | 0.483 | 0.114 (1.978) | 5.7** (2.559) | 6.549 | Positive and Significant |
| MMFSL | 0.799 | 0.539 (7.578) | -14.5*** (-5.270) | 27.775 | Negative and Significant |
| LTFL | 0.386 | 0.236 (2.264) | -8.5***i*** (-2.096) | 4.395 | Negative and Insignificant |
| STFCL | 0.093 | 0.142 (3.472) | 1.3*i* (0.846) | 0.716 | Positive and Insignificant |
| CFL | 0.698 | 0.591 (5.777) | -15.9*** (-4.026) | 16.209 | Negative and Significant |
| ICL | 0.764 | 0.665 (5.017) | -24.4*** (-4.761) | 22.666 | Negative and Significant |
| CIFCL | 0.642 | 0.118 (3.548) | -4.6*** (-3.545) | 12.564 | Negative and Significant |

***Source: Computed***

Notes:

i. The trend co-efficient (represented by 'b') has been multiplied by 100 to express the growth rate in percentage form
ii. *** marked value indicates significant at 1% level (Two tailed)
iii. ** marked value indicates significant at 5% level (Two tailed)
iv***. i*** marked value indicates insignificant
v. Figures in bracket indicate 't' value
vi. d.f. = (n-k-1)> (9-1-1) =7

***Interpretation of Regression Results (Table 7.12)***:

From the above analysis, it has become clear that the growth rates of CR of nine companies are negative and out of which the growth rates of CR of six companies are statistically significant. This means that these six companies encountered the problems of increasing their short term cash payments. Four companies registered positive growth rates and out of these four companies the growth rate of CR of two companies were statistically significant at 5% probability level implying thereby that these two companies strengthened their short term solvency condition as CR measured the short term solvency and ability to meet short term obligations. In this case, the situation is rather disappointing as evident from the trend of the growth rates of individual companies. But at the same time the situation appears to be really very disappointing because the aggregate growth rate of CR for all the sample asset finance companies taken together is negative and statistically significant at 1 % probability level.

Now presented below is the summary result of growth rates for the selected financial ratios of the selected investment companies and asset finance companies at the aggregative and at the individual company level.

**Table 7.13: Summary results of Growth Rates of selected ratios under semi-log regression model**

| Performance Indicators : Ratios | Investment Companies | | Assets Finance Companies | |
|---|---|---|---|---|
| | Aggregative | Company-wise | Aggregative | Company-wise |
| ROA | Negative and Insignificant | Positive and Significant in 1 Company, Positive and Insignificant in 1 Company, Negative but Insignificant in 3 Companies | Positive and Insignificant | Negative but Significant in 2 Companies, Positive and Significant in 7 Companies, Positive and Insignificant in 3 Companies, Negative and Insignificant in 1 Company |
| ROCE | Negative and Insignificant | Negative and Insignificant in 3 Companies, Positive but Insignificant in 2 Companies | Positive and Significant at 5% Probability Level | Positive and Significant in 5 Companies, Negative and Significant in 1 Company, Positive but Insignificant in 6 Companies, Negative and insignificant in 1 Company |
| ROE | Negative and Insignificant | Negative and Significant 1 Company, Negative and Insignificant in 2 Companies, Positive and Insignificant in 2 Companies | Negative and Insignificant | Negative and Significant in 2 Companies, Positive and Significant in 3 Companies, Negative and Insignificant in 6 Companies, Positive and Insignificant in 2 Companies |
| DER | Negative and Insignificant | Negative and Significant 1 Company, Positive and Significant 1 Company, Negative but Insignificant 1 Company, Positive and Insignificant in 2 Companies, | Negative and Significant at 1% Probability Level | Negative but Significant 8 Companies, Negative and Insignificant in 5 Companies |
| NPR | Negative and Insignificant | Negative and Significant in 1 Company, Negative and Insignificant in 2 Company, Positive and Insignificant in 2 Company | Negative and Insignificant | Negative and Significant in 4 Companies, Positive and Significant in 3 Companies, Negative but Insignificant in 3 Companies, Positive and Insignificant in 3 Companies |
| CR | Negative and Significant at 1% Probability Level | Negative and Significant in 2 Company, Positive and Significant in 1 Company, Negative and Insignificant in 1 Company, Positive but Insignificant in 1 Company | Negative and Significant at 1% Probability Level | Negative and Significant in 6 Companies, Positive and Significant in 2 Companies, Negative and Insignificant in 3 Companies, Positive but Insignificant in 2 Companies |

***Source: Computed***

From Table 7.13, we find negative growth rates of selected ratios for both the categories of companies (except for the ratios ROA and ROCE of selected asset finance companies) at aggregative level. This is indicative of the fact that both the categories of NBFCs have experienced lower rate of return during the period under study (excepting ROA and ROCE of selected asset finance companies); further, none of the two categories of NBFCs have been able to manage their capital structure in respect of long term solvency (represented by DR ratio) and short term liquidity (represented by CR) during the study period.

Despite significant growth is assets and liabilities (as observed in Table 5.32 and 6.32), we find lower rates of returns for the companies as a whole (Table 7.13). So this clearly indicates that neither the direct nor the indirect expenses could be effectively managed during the study period at the aggregative level by the companies under study.

At individual company level for investment companies, similar results were obtained as at the aggregative level. For asset finance companies at disaggregate level, we find significant positive as well as negative growth rates during the study period.

## 7.2 RATIO ANALYSIS OF FINANCIAL PERFORMANCE INDICATORS OF SELECTED NBFCS (AGGREGATIVE AND COMPANY WISE)

Financial statement is analyzed in order to provide information to various decision-makers like investors, lenders, management, and analysts. Performances are reported in financial statements but statement contains large volume of figures. For facilitating financial statement analysis and its interpretation, these volumes of financial statement items are reduced to comprehensible small sizes without losing structural relation among the various components of the original statements. This mechanism is popularly known as ratio analysis.

Ratios reveal comparative relation between two items of financial statement and at the same time once the structure of financial components in general are known, these ratios also unfold information on other items. Under this analysis, financial statements are broken down into components and then these components are evaluated in relation to each other and compared to external ideals or norms, if any.

In our study, to understand the financial performance in respect of selected performance indicators such as ROA, ROCE, ROE, NPR, DE Ratio, and CR (as discussed at the beginning of the chapter) of selected NBFCs we have carried out ratio analysis during the period under study.

Here we have carried out the ratio analysis of the two categories of NBFCs, i.e., Investment Companies (Aggregative and Company wise) and Asset Finance Companies (Aggregative and Company wise) in respect of the selected ratios individually to understand the profitability situation, long term solvency, and short term solvency of those NBFCs during the period under study.

### 7.2.1 RATIO-WISE ANALYSIS OF FINANCIAL PERFORMANCE INDICATORS OF SELECTED INVESTMENT COMPANIES (AGGREGATIVE AND COMPANY WISE) DURING THE STUDY PERIOD

**Table 7.14: Analysis of Return on Assets (ROA) as Financial Performance Indicator of Selected Investment Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | BACL | SCL | LTIDPL | REL | ILFSL |
|---|---|---|---|---|---|---|
| 2006-07 | 0.39 | 17.06 | 2.24 | 6.69 | 0.02 | 0.28 |
| 2007-08 | 0.41 | 0.68 | 2.73 | 8.08 | 0.02 | 0.34 |
| 2008-09 | 0.54 | 0.65 | 4.56 | 0.55 | (0.08) | 0.42 |
| 2009-10 | 1.22 | 1.24 | 18.80 | 7.30 | 0.11 | 0.57 |
| 2010-11 | 0.58 | 1.52 | 32.00 | 0.23 | (0.18) | 0.63 |
| 2011-12 | 0.67 | 0.79 | 33.35 | 0.10 | (0.09) | 0.92 |
| 2012-13 | 0.54 | 0.68 | 22.66 | 0.29 | (0.26) | 0.95 |
| 2013-14 | 0.06 | 2.16 | 12.56 | 0.09 | 0.01 | 0.01 |
| 2014-15 | 0.06 | 1.15 | 12.29 | 8.70 | 0.15 | 0.01 |
| **Average** | 0.50 | 2.88 | 15.69 | 3.56 | (0.03) | 0.46 |
| **Standard Deviation** | 0.35 | 5.34 | 11.88 | 3.96 | 0.13 | 0.34 |
| **C.V.** | 0.70 | 1.85 | 0.76 | 1.11 | (3.89) | 0.75 |

***Source: Computed***

****Aggregate ROA = (Profit after Tax of all the sample companies taken together) ÷ (Tangible Fixed Assets of all the sample companies taken together)***

From Table 7.14 we can make the following observations at the aggregative and individual company levels.

**Aggregative Analysis:** At the aggregate level, ROA shows an increasing trend in the first four years and thereafter a fluctuating trend with an average of 0.50 and C.V. at 0.70. The ROA varied between 0.06 and 1.22 during the period under study.

**Company-wise Analysis:** On an average**,** SCL has recorded the highest ROA (15.69), while REL shows negative ROA (-0.05) on the average. Only SCL and ILFSL have shown an increasing trend in ROA during the first 6 and 7 years respectively under

study. Majority of the sample companies, i.e., 3 out of 5 sample companies, on an average, have shown higher performance levels than that of the average performance of the aggregate sample companies.

**Table 7.15: Analysis of Return on Capital Employed (ROCE) as Financial Performance Indicator of Selected Investment Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | BACL | SCL | LTIDPL | REL | ILFSL |
|---|---|---|---|---|---|---|
| 2006-07 | 0.02 | 0.12 | 0.02 | 0.01 | 0.01 | 0.02 |
| 2007-08 | 0.02 | 0.04 | 0.02 | 0.02 | 0.01 | 0.02 |
| 2008-09 | 0.02 | 0.04 | 0.03 | 0.01 | (0.03) | 0.03 |
| 2009-10 | 0.05 | 0.07 | 0.04 | 0.29 | 0.01 | 0.04 |
| 2010-11 | 0.03 | 0.09 | 0.05 | 0.01 | (0.02) | 0.04 |
| 2011-12 | 0.03 | 0.04 | 0.06 | 0.00 | (0.02) | 0.04 |
| 2012-13 | 0.03 | 0.03 | 0.05 | 0.01 | (0.05) | 0.04 |
| 2013-14 | 0.02 | 0.10 | 0.04 | 0.00 | 0.00 | 0.01 |
| 2014-15 | 0.02 | 0.04 | 0.03 | 0.08 | 0.03 | 0.01 |
| **Average** | 0.03 | 0.06 | 0.04 | 0.05 | (0.01) | 0.03 |
| **Standard Deviation** | 0.01 | 0.03 | 0.01 | 0.09 | 0.02 | 0.01 |
| **C.V.** | 0.31 | 0.50 | 0.32 | 1.99 | (3.50) | 0.51 |

***Source: Computed***

****Aggregate ROCE = (Profit after Tax of all the sample companies taken together) ÷ (Equity Capital plus Reserves & Surplus plus Long Term Debt of all the sample companies taken together)***

From Table 7.15 the inferences can be drawn on aggregative and individual company wise level.

**Aggregative Analysis:** The ROCE of all the sample companies taken together has remained more or less constant ranging between 0.02 and 0.05 with an average of 0.03 and C.V. at 0.31.

**Company-wise Analysis:** Among the sample companies, BACL, on the average, has registered the highest ROCE, while REL has recorded the lowest average ROCE (-0.01) during the study period. Moreover, no specific trend has been observed in ROCE among the sample companies under study.

A further close examination of the above table reveals that, on an average, BACL, SCL, and LTIDPL have shown better performance in ROCE in relation to the average ROCE of the aggregate sample companies.

**Table 7.16: Analysis of Return on Equity (ROE) as Financial Performance Indicator of Selected Investment Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | BACL | SCL | LTIDPL | REL | ILFSL |
|---|---|---|---|---|---|---|
| 2006-07 | 0.12 | 0.17 | 0.29 | 0.01 | 0.02 | 0.05 |
| 2007-08 | 0.10 | 0.07 | 0.22 | 0.02 | 0.02 | 0.06 |
| 2008-09 | 0.12 | 0.06 | 0.27 | 0.01 | (0.09) | 0.07 |
| 2009-10 | 0.17 | 0.10 | 0.23 | 0.32 | 0.04 | 0.10 |
| 2010-11 | 0.10 | 0.11 | 0.25 | 0.01 | (0.09) | 0.11 |
| 2011-12 | 0.10 | 0.05 | 0.21 | 0.00 | (0.04) | 0.14 |
| 2012-13 | 0.08 | 0.04 | 0.19 | 0.01 | (0.15) | 0.13 |
| 2013-14 | 0.08 | 0.12 | 0.15 | 0.00 | 0.01 | 0.06 |
| 2014-15 | 0.09 | 0.06 | 0.13 | 0.09 | 0.08 | 0.06 |
| **Average** | 0.11 | 0.09 | 0.22 | 0.05 | (0.02) | 0.09 |
| **Standard Deviation** | 0.03 | 0.04 | 0.05 | 0.10 | 0.07 | 0.03 |
| **C.V.** | 0.25 | 0.46 | 0.24 | 1.98 | (3.28) | 0.39 |

***Source: Computed***

****Aggregate ROE = (Profit after Tax of all the sample companies taken together) ÷ (Equity Capital plus Reserves & Surplus of all the sample companies taken together)***

From Table 7.16 we can make the following observations on aggregative and individual company wise level.

**Aggregative Analysis:** The value of ROE of sample companies in the aggregate varied between 0.08 and 0.17 with an average of 0.11 and C.V. at 0.25.

**Company-wise Analysis:** On an average, the highest ROE is observed in SCL and the lowest in REL during the study period. Further, the average performance in ROE of all the sample companies (except SCL) at the aggregative level remained below the average performance.

**Table 7.17: Analysis of Debt Equity Ratio (DER) as Financial Performance Indicator of Selected Investment Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | BACL | SCL | LTIDPL | REL | ILFSL |
|---|---|---|---|---|---|---|
| 2006-07 | 4.16 | 0.43 | 10.92 | 0.04 | 1.61 | 1.52 |
| 2007-08 | 3.61 | 0.55 | 8.33 | 0.04 | 1.65 | 1.58 |
| 2008-09 | 4.13 | 0.49 | 8.86 | 0.20 | 1.67 | 1.61 |
| 2009-10 | 2.70 | 0.40 | 4.81 | 0.08 | 2.13 | 1.54 |
| 2010-11 | 2.92 | 0.31 | 4.06 | 0.31 | 3.59 | 1.67 |
| 2011-12 | 1.83 | 0.54 | 2.76 | 0.00 | 1.68 | 2.17 |
| 2012-13 | 2.05 | 0.52 | 2.83 | 0.06 | 2.26 | 2.12 |
| 2013-14 | 3.29 | 0.27 | 2.86 | 0.14 | 2.10 | 6.19 |
| 2014-15 | 3.72 | 0.39 | 3.52 | 0.09 | 2.23 | 7.50 |
| **Average** | 3.16 | 0.43 | 5.44 | 0.11 | 2.10 | 2.88 |
| **Standard Deviation** | 0.85 | 0.10 | 3.10 | 0.09 | 0.62 | 2.29 |
| **C.V.** | 0.27 | 0.23 | 0.57 | 0.88 | 0.29 | 0.79 |

***Source: Computed***

****Aggregate DER = (Long Term Debt of all the sample companies taken together) ÷ (Equity Capital plus Reserves & Surplus of all the sample companies taken together)***

The figures presented in Table 7.17 are analyzed below.

**Aggregative Analysis:** No specific trend is observed at the aggregate level. The D/E ratio varied between 1.83 in 2011-12 and 4.16 in 2006-07 with an average of 3.16 and C.V. at 0.27.

**Company-wise Analysis:** No specific trend has been observed in D/E ratio during the study period in respect of individual companies. On an average, the highest D/E ratio

is observed in SCL, while the lowest is in LTIDPL. Furthermore, the average D/E ratios of all the selected sample companies (except SCL) remained below the aggregate D/E ratio during the period under study.

**Table 7.18: Analysis of Net Profit Ratio (NPR) as Financial Performance Indicator of Selected Investment Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | BACL | SCL | LTIDPL | REL | ILFSL |
|---|---|---|---|---|---|---|
| 2006-07 | 0.14 | 0.83 | 0.18 | 0.48 | 0.01 | 0.15 |
| 2007-08 | 0.12 | 0.69 | 0.16 | 0.51 | 0.01 | 0.16 |
| 2008-09 | 0.12 | 0.66 | 0.16 | 0.28 | (0.05) | 0.17 |
| 2009-10 | 0.22 | 0.79 | 0.19 | 0.73 | 0.06 | 0.20 |
| 2010-11 | 0.13 | 0.85 | 0.23 | 0.27 | (0.10) | 0.21 |
| 2011-12 | 0.14 | 0.52 | 0.21 | 0.06 | (0.05) | 0.32 |
| 2012-13 | 0.11 | 0.43 | 0.21 | 0.18 | (0.14) | 0.26 |
| 2013-14 | 0.07 | 0.40 | 0.16 | 0.02 | 0.01 | 0.03 |
| 2014-15 | 0.09 | 0.53 | 0.14 | 0.24 | 0.08 | 0.03 |
| **Average** | 0.13 | 0.63 | 0.18 | 0.31 | (0.02) | 0.17 |
| **Standard Deviation** | 0.04 | 0.17 | 0.03 | 0.23 | 0.07 | 0.09 |
| **C.V.** | 0.31 | 0.27 | 0.16 | 0.74 | (3.78) | 0.55 |

***Source: Computed***

****Aggregate NPR = (Profit after tax of all the sample companies taken together) ÷ (Total Income of all the sample companies taken together)***

The figures given in Table 7.18 are analyzed in the following way.

**Aggregative Analysis:** The NPR of the sample companies at the aggregative level reveals no specific trend. The NPR ranges between 0.07 and 0.14 with an average of 0.13 and C.V. at 0.31.

**Company-wise Analysis:** On the average, BACL has recorded the highest NPR (0.63), while the lowest NPR (-0.02) is recorded in REL during the study period.

Except REL, all the average NPR performance of the sample companies lies above the average NPR of the aggregate sample companies under study.

**Table 7.19: Analysis of Current Ratio (CR) as Financial Performance Indicator of Selected Investment Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | BACL | SCL | LTIDPL | REL | ILFSL |
|---|---|---|---|---|---|---|
| 2006-07 | 3.44 | 4.52 | 10.65 | 0.20 | 1.38 | 0.17 |
| 2007-08 | 3.24 | 1.60 | 9.57 | 0.21 | 1.36 | 0.18 |
| 2008-09 | 3.83 | 2.78 | 9.15 | 0.26 | 1.37 | 0.18 |
| 2009-10 | 3.77 | 2.89 | 4.84 | 10.37 | 5.21 | 0.26 |
| 2010-11 | 3.31 | 1.97 | 3.48 | 1.79 | 5.25 | 0.43 |
| 2011-12 | 1.20 | 0.43 | 1.47 | 4.86 | 0.94 | 0.56 |
| 2012-13 | 1.11 | 0.34 | 1.23 | 0.82 | 1.03 | 0.52 |
| 2013-14 | 0.95 | 0.33 | 1.41 | 0.23 | 0.80 | 0.69 |
| 2014-15 | 0.95 | 1.02 | 1.43 | 0.42 | 0.70 | 0.76 |
| **Average** | 2.42 | 1.76 | 4.80 | 2.13 | 2.01 | 0.42 |
| **Standard Deviation** | 1.31 | 1.43 | 3.94 | 3.44 | 1.85 | 0.23 |
| **C.V.** | 0.54 | 0.81 | 0.82 | 1.62 | 0.92 | 0.56 |

***Source: Computed***

****Aggregate CR = (Current Assets of all the sample companies taken together) ÷ (Current Liabilities of all the sample companies taken together)***

Analysis of the above table is as follows.

**Aggregative Analysis:** Almost a decreasing trend in CR is observed from 2008-09 to 2014-15. The average CR is 2.42 which lies above the standard norm of 2:1. The C.V. is found to be 0.5 during the study period. Further, the ratios varied between 0.95 and 3.83.

**Company-wise Analysis:** No specific trend has been observed in the individual sample companies under study. On the average, SCL shows the highest level of liquidity in terms of CR (4.80) while the lowest average CR is observed in ILFSL. A

further analysis of the above table reveals that the average CR of SCL lies above the average CR of the sample companies at the aggregate level. Moreover, all the individual sample companies have experienced erratic fluctuation in CR during the period under study.

**Overall Observation of Ratio Analysis of Selected Performance Indicator of Selected Investment Companies:**

The profitability performances in terms of the selected ratios (i.e. ROA, ROCE, ROE and NPR) of the investment companies are also not satisfactory both at the aggregative and at the disaggregate levels. Even negative rate of returns has been experienced by REL during the study period.

The average long term loan solvency of each of the individual sample companies (except SCL) has been maintained with lower D/E ratios. In comparison, the aggregate D/E ratios have been relatively higher, implying that the majority of the sample companies have employed more equity than debt in financing their assets. The average short term solvency represented by CRs of the sample companies at the aggregative level has been ensured by maintaining a higher level of liquidity, while majority of the sample companies have maintained lower level of liquidity during the period under study at their individual level.

### 7.2.2 RATIO ANALYSIS OF FINANCIAL PERFORMANCE INDICATOR OF SELECTED ASSET FINANCE COMPANIES (AGGREGATIVE AND COMPANY WISE)

**Table 7.20: Analysis of Return on Assets (ROA) as Financial Performance Indicator of Selected Asset Finance Companies –Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | SEFL | MFL | SCUFL | SFL | DFL | IFL | GFL | MMFSL | LTFL | STFCL | CFL | ICL | CIFCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006-07 | 0.46 | 0.19 | 0.15 | 0.93 | 0.34 | 3.62 | 0.56 | 0.12 | 4.75 | 0.17 | 1.44 | 0.91 | 3.17 | 0.71 |
| 2007-08 | 0.74 | 0.30 | 0.23 | 1.72 | 0.18 | 3.84 | 0.60 | 0.12 | 5.52 | 0.29 | 2.73 | 0.97 | 3.20 | 0.73 |
| 2008-09 | 1.07 | 0.26 | 0.16 | 3.14 | 0.20 | 4.17 | 0.60 | 0.12 | 5.77 | 0.41 | 4.56 | 1.08 | 3.36 | (0.44) |
| 2009-10 | 1.69 | 0.48 | 0.32 | 9.50 | 0.18 | 4.08 | 0.58 | 0.11 | 7.36 | 0.40 | 18.80 | 1.57 | 3.66 | 2.69 |
| 2010-11 | 0.91 | 0.09 | 0.64 | 8.16 | 0.11 | 4.23 | 0.95 | 0.15 | 6.07 | 0.52 | 33.80 | 2.09 | 1.14 | 2.26 |
| 2011-12 | 0.81 | 0.06 | 0.44 | 6.35 | 0.17 | 3.07 | 2.20 | 0.24 | 6.26 | 0.40 | 33.35 | 3.02 | 2.01 | 2.99 |
| 2012-13 | 1.34 | 0.14 | 0.76 | 4.99 | 0.22 | 4.27 | 2.67 | 0.21 | 8.15 | 0.74 | 22.66 | 4.20 | 2.63 | 4.23 |
| 2013-14 | 1.18 | 0.07 | 0.81 | 5.20 | 0.24 | 2.65 | 4.25 | 0.17 | 7.42 | 0.62 | 12.56 | 4.06 | 7.17 | 4.96 |
| 2014-15 | 1.25 | 0.07 | 0.85 | 6.90 | 0.27 | 5.29 | 5.53 | 1.17 | 7.66 | 0.90 | 6.67 | 3.99 | 2.05 | 6.45 |
| **Average** | 1.05 | 0.18 | 0.48 | 5.21 | 0.21 | 3.91 | 1.99 | 0.27 | 6.55 | 0.49 | 15.17 | 2.43 | 3.15 | 2.73 |
| **Standard Deviation** | 0.37 | 0.14 | 0.28 | 2.88 | 0.06 | 0.76 | 1.84 | 0.34 | 1.14 | 0.23 | 12.66 | 1.40 | 1.70 | 2.22 |
| **C.V.** | 0.35 | 0.78 | 0.59 | 0.55 | 0.31 | 0.19 | 0.92 | 1.26 | 0.17 | 0.46 | 0.83 | 0.58 | 0.54 | 0.81 |

***Source: Computed***

****Aggregate ROA = (Profit after Tax of all the sample companies taken together) ÷ (Tangible Fixed Assets of all the sample companies taken together)***

From Table 7.20 the following observations can be made on the companies' performance at the aggregate and at the individual company levels.

**Aggregative Analysis:** The ROA of all the sample asset finance companies taken together shows a wide fluctuation with amplitudes ranging between 0.46 in the year 2006-07 and 1.69 in 2009-10.

**Company-wise Analysis:** None of the sample companies reveals any specific trend in ROA during the study period. On the average, STFCL has registered the highest ROA (15.17), while SFL has registered the lowest ROA (0.18) during the period under study. So far as consistency in ROA performance is concerned, almost all the sample companies (except DFL and MMFSL) have experienced wide fluctuations in ROA during the study period. A closer look at the above table further reveals that out of 13 sample companies, as many as 8 sample companies have, in general, put up better performance in ROA than the average performance in ROA for the sample companies under study at the aggregative level.

**Table7.21: Analysis of Return on Capital Employed (ROCE) as Financial Performance Indicator of Selected Asset Finance Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | SEFL | MFL | SCUFL | SFL | DFL | IFL | GFL | MMFSL | LTFL | STFCL | CFL | ICL | CIFCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006-07 | 0.02 | 0.02 | 0.02 | 0.03 | 0.01 | 0.10 | 0.06 | 0.02 | 0.02 | 0.02 | 0.01 | 0.03 | 0.02 | 0.01 |
| 2007-08 | 0.02 | 0.02 | 0.02 | 0.03 | 0.01 | 0.09 | 0.06 | 0.02 | 0.03 | 0.02 | 0.02 | 0.04 | 0.02 | 0.01 |
| 2008-09 | 0.02 | 0.02 | 0.01 | 0.02 | 0.01 | 0.10 | 0.06 | 0.02 | 0.03 | 0.02 | 0.03 | 0.04 | 0.02 | (0.00) |
| 2009-10 | 0.03 | 0.02 | 0.02 | 0.03 | 0.01 | 0.09 | 0.06 | 0.02 | 0.04 | 0.02 | 0.04 | 0.05 | 0.02 | 0.01 |
| 2010-11 | 0.04 | 0.01 | 0.07 | 0.04 | 0.05 | 0.10 | 0.08 | 0.03 | 0.05 | 0.03 | 0.06 | 0.12 | 0.04 | 0.01 |
| 2011-12 | 0.04 | 0.01 | 0.02 | 0.04 | 0.07 | 0.10 | 0.07 | 0.04 | 0.05 | 0.02 | 0.05 | 0.16 | 0.06 | 0.02 |
| 2012-13 | 0.04 | 0.02 | 0.03 | 0.04 | 0.08 | 0.09 | 0.11 | 0.04 | 0.05 | 0.03 | 0.05 | 0.18 | 0.04 | 0.03 |
| 2013-14 | 0.03 | 0.01 | 0.03 | 0.04 | 0.05 | 0.06 | 0.11 | 0.02 | 0.04 | 0.02 | 0.04 | 0.16 | 0.05 | 0.03 |
| 2014-15 | 0.03 | 0.01 | 0.03 | 0.05 | 0.03 | 0.09 | 0.06 | 0.06 | 0.04 | 0.03 | 0.02 | 0.14 | 0.02 | 0.03 |
| **Average** | 0.03 | 0.02 | 0.03 | 0.04 | 0.04 | 0.09 | 0.07 | 0.03 | 0.04 | 0.02 | 0.04 | 0.10 | 0.03 | 0.02 |
| **Standard Deviation** | 0.01 | 0.00 | 0.02 | 0.01 | 0.03 | 0.01 | 0.02 | 0.02 | 0.01 | 0.00 | 0.02 | 0.06 | 0.01 | 0.01 |
| **C.V.** | 0.28 | 0.30 | 0.54 | 0.23 | 0.71 | 0.14 | 0.30 | 0.55 | 0.24 | 0.17 | 0.44 | 0.61 | 0.46 | 0.75 |

***Source: Computed***

****Aggregate ROCE = (Profit after Tax of all the sample companies taken together) ÷ (Equity Capital plus Reserves & Surplus plus Long Term Debt of all the sample companies taken together)***

*Performance of the asset finance companies taken together and as individual units in terms of ROCE (Return on Capital Employed):*

The figures presented in the table 7.21 reveal the following things:

**Aggregative Analysis:** The ROCE of all the sample companies taken together remains constant at 0.02 in the first three years. Thereafter, it remains constant at 0.04 from 2010-11 to 2012-13 and again it remained constant at 0.03 during the last two years under study. The average of ROCE of the sample companies at the aggregative level is found to be 0.03 with C.V. at 0.28.

**Company-wise Analysis:** No specific trend is observed in ROCE of any of the companies over the years under study. Among the sample companies, on an average, CFL has recorded the highest ROCE (0.10), while the lowest ROCE (0.02) has been recorded by three companies, namely SEFL, LTFL and CIFCL. In terms of consistency in ROCE, the companies such as MFL, SFL, GFL, STFCL, CFL, ICL, and CIFCL exhibit wide fluctuations during the study period.

Out of 13 sample companies, only 7 companies (53.85%) on an average have registered higher ROCE in relation to the average ROCE of the aggregate sample companies.

**Table 7.22: Analysis of Return on Equity (ROE) as Financial Performance Indicator of Selected Asset Finance Companies –Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | SEFL | MFL | SCUFL | SFL | DFL | IFL | GFL | MMFSL | LTFL | STFCL | CFL | ICL | CIFCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006-07 | 0.14 | 0.17 | 0.09 | 0.15 | 0.06 | 0.16 | 0.14 | 0.02 | 0.17 | 0.17 | 0.12 | 0.08 | 0.12 | 0.09 |
| 2007-08 | 0.17 | 0.18 | 0.13 | 0.20 | 0.06 | 0.15 | 0.15 | 0.02 | 0.14 | 0.16 | 0.21 | 0.08 | 0.12 | 0.09 |
| 2008-09 | 0.15 | 0.07 | 0.10 | 0.18 | 0.08 | 0.16 | 0.15 | 0.02 | 0.15 | 0.12 | 0.26 | 0.08 | 0.12 | (0.03) |
| 2009-10 | 0.18 | 0.12 | 0.14 | 0.20 | 0.08 | 0.15 | 0.13 | 0.02 | 0.20 | 0.14 | 0.23 | 0.11 | 0.11 | 0.07 |
| 2010-11 | 0.17 | 0.06 | 0.17 | 0.20 | 0.07 | 0.16 | 0.11 | 0.03 | 0.19 | 0.13 | 0.25 | 0.13 | 0.10 | 0.08 |
| 2011-12 | 0.15 | 0.05 | 0.06 | 0.21 | 0.09 | 0.16 | 0.09 | 0.05 | 0.21 | 0.10 | 0.21 | 0.17 | 0.14 | 0.12 |
| 2012-13 | 0.16 | 0.08 | 0.09 | 0.20 | 0.10 | 0.15 | 0.14 | 0.05 | 0.20 | 0.10 | 0.19 | 0.18 | 0.11 | 0.16 |
| 2013-14 | 0.14 | 0.04 | 0.10 | 0.18 | 0.10 | 0.08 | 0.17 | 0.03 | 0.18 | 0.09 | 0.15 | 0.16 | 0.12 | 0.16 |
| 2014-15 | 0.12 | 0.03 | 0.10 | 0.14 | 0.10 | 0.13 | 0.11 | 0.07 | 0.15 | 0.11 | 0.11 | 0.14 | 0.04 | 0.14 |
| **Average** | 0.15 | 0.09 | 0.11 | 0.18 | 0.08 | 0.15 | 0.13 | 0.04 | 0.18 | 0.12 | 0.19 | 0.12 | 0.11 | 0.10 |
| **Standard Deviation** | 0.02 | 0.06 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.05 | 0.04 | 0.03 | 0.06 |
| **C.V.** | 0.13 | 0.63 | 0.29 | 0.13 | 0.21 | 0.17 | 0.18 | 0.52 | 0.15 | 0.22 | 0.28 | 0.33 | 0.25 | 0.59 |

***Source: Computed***

****Aggregate ROE = (Profit after Tax of all the sample companies taken together) ÷ (Equity Capital plus Reserves & Surplus of all the sample companies taken together)***

*Analyses of the performances of the asset finance companies in the aggregate and as individual units in terms of ROE (Return on Equity):*

The aggregative as well as the individual company-wise analyses of their financial performance shows (Table 7.22) up the following pictures:

**Aggregative Analysis:** The ROE of the sample companies in aggregate reveal a fluctuating trend with an average of 0.15 and C.V. at 13%. The ROE ranges between 0.12 in the year 2014-15 and 0.18 in 2009-10.

**Company-wise Analysis:** The individual sample companies have shown no specific trend in ROE during the period under study. On the average, STFCL has recorded the highest ROE (0.19) while the lowest ROE (0.04) has been found in GFL.

Majority of the sample companies have experienced relatively stable performance in ROE that varied as measured by C.V between 0.13 and 33 during the study period.

A further analysis of Table 7.22 reveals that only 3 companies (SCUFL, MMFSL, and STFCL), on an average, have recorded higher ROE than the average aggregative value of ROE. This may be put in a different way: the majority of the sample companies have experienced lower returns on equity in comparison to the average performance in respect of ROE of the sample companies under study, at the aggregate level.

**Table 7.23: Analysis of Debt Equity Ratio (DER) as Financial Performance Indicator of Selected Asset Finance Companies – Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | SEFL | MFL | SCUFL | SFL | DFL | IFL | GFL | MMFSL | LTFL | STFCL | CFL | ICL | CIFCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006-07 | 7.24 | 6.61 | 2.93 | 4.40 | 3.36 | 0.66 | 1.27 | 0.22 | 6.29 | 6.74 | 9.30 | 1.22 | 4.53 | 10.42 |
| 2007-08 | 6.63 | 7.67 | 5.01 | 6.80 | 4.29 | 0.66 | 1.34 | 0.24 | 3.84 | 5.60 | 8.13 | 1.20 | 4.56 | 10.21 |
| 2008-09 | 6.06 | 3.73 | 6.02 | 6.49 | 5.08 | 0.63 | 1.46 | 0.25 | 3.52 | 5.26 | 8.69 | 1.20 | 4.46 | 7.56 |
| 2009-10 | 5.05 | 5.09 | 7.68 | 4.78 | 5.57 | 0.62 | 1.40 | 0.27 | 3.72 | 5.70 | 4.80 | 1.24 | 4.44 | 7.27 |
| 2010-11 | 3.23 | 3.28 | 1.54 | 3.67 | 0.40 | 0.62 | 0.43 | 0.18 | 2.78 | 3.18 | 3.23 | 0.06 | 1.49 | 5.36 |
| 2011-12 | 3.19 | 2.45 | 1.70 | 4.11 | 0.28 | 0.59 | 0.42 | 0.32 | 3.42 | 3.80 | 2.99 | 0.02 | 1.42 | 5.15 |
| 2012-13 | 3.12 | 2.70 | 2.43 | 3.86 | 0.34 | 0.60 | 0.22 | 0.32 | 3.14 | 3.00 | 3.04 | 0.00 | 1.42 | 4.32 |
| 2013-14 | 3.14 | 2.75 | 1.95 | 3.10 | 1.15 | 0.42 | 0.60 | 0.18 | 3.56 | 3.25 | 3.02 | 0.00 | 1.55 | 4.36 |
| 2014-15 | 3.12 | 2.63 | 2.00 | 2.00 | 2.18 | 0.50 | 0.90 | 0.10 | 2.95 | 3.34 | 3.85 | 0.00 | 1.56 | 4.03 |
| **Average** | 4.53 | 4.10 | 3.47 | 4.36 | 2.51 | 0.59 | 0.89 | 0.23 | 3.69 | 4.43 | 5.23 | 0.55 | 2.83 | 6.52 |
| **Standard Deviation** | 1.73 | 1.92 | 2.22 | 1.52 | 2.12 | 0.08 | 0.49 | 0.07 | 1.03 | 1.40 | 2.69 | 0.63 | 1.59 | 2.48 |
| **C.V.** | 0.38 | 0.47 | 0.64 | 0.35 | 0.84 | 0.13 | 0.54 | 0.30 | 0.28 | 0.32 | 0.51 | 1.15 | 0.56 | 0.38 |

***Source: Computed***

****Aggregate DER = (Long Term Debt of all the sample companies taken together) ÷ (Equity Capital plus Reserves & Surplus of all the sample companies taken together)***

*Analyses of performance of asset finance companies in the aggregate and as individual units, in terms of DER (Debt Equity Ratio):*

A look at the table 7.23 enables us to extract the following observations on the financial performance of the companies under study in terms of DER.

**Aggregative Analysis:** The DE ratios of the sample companies in the aggregate reveal a decreasing trend that ranges between 3.12 in the year 2012-13 and 7.24 in ~~year~~ 2006-07 with an average of 4.53 and C.V. at 0.38.

**Company-wise Analysis:** No specific trend is observed for the individual sample companies under study. On an average, CIFCL has recorded the highest D/E ratio (6.52) while GFL has recorded the lowest D/E ratio (0.23). Majority of the sample companies have shown higher fluctuation in D/E ratio during the study period.

A further analysis of the above table shows that out of 13 sample companies, only 2 sample companies (15.38%), on an average, have higher D/E ratio than the average D/E ratio of the sample companies at the aggregative level.

**Table 7.24: Analysis of Net Profit Ratio (NPR) as Financial Performance Indicator of Selected Asset Finance Companies –Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | SEFL | MFL | SCUFL | SFL | DFL | IFL | GFL | MMFSL | LTFL | STFCL | CFL | ICL | CIFCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006-07 | 0.14 | 0.20 | 0.11 | 0.15 | 0.10 | 0.26 | 0.30 | 0.08 | 0.16 | 0.23 | 0.13 | 0.14 | 0.14 | 0.06 |
| 2007-08 | 0.14 | 0.17 | 0.11 | 0.14 | 0.08 | 0.27 | 0.30 | 0.09 | 0.15 | 0.19 | 0.16 | 0.15 | 0.14 | 0.05 |
| 2008-09 | 0.12 | 0.10 | 0.06 | 0.13 | 0.08 | 0.26 | 0.30 | 0.09 | 0.16 | 0.12 | 0.16 | 0.16 | 0.14 | (0.02) |
| 2009-10 | 0.17 | 0.16 | 0.09 | 0.18 | 0.08 | 0.25 | 0.30 | 0.09 | 0.22 | 0.16 | 0.19 | 0.22 | 0.13 | 0.06 |
| 2010-11 | 0.18 | 0.11 | 0.14 | 0.18 | 0.09 | 0.26 | 0.21 | 0.11 | 0.24 | 0.16 | 0.23 | 0.26 | 0.13 | 0.07 |
| 2011-12 | 0.16 | 0.06 | 0.07 | 0.16 | 0.10 | 0.26 | 0.15 | 0.15 | 0.22 | 0.11 | 0.21 | 0.30 | 0.12 | 0.09 |
| 2012-13 | 0.16 | 0.08 | 0.09 | 0.14 | 0.11 | 0.26 | 0.17 | 0.15 | 0.23 | 0.10 | 0.21 | 0.34 | 0.11 | 0.12 |
| 2013-14 | 0.13 | 0.04 | 0.08 | 0.16 | 0.10 | 0.16 | 0.19 | 0.08 | 0.18 | 0.09 | 0.16 | 0.33 | 0.12 | 0.11 |
| 2014-15 | 0.11 | 0.04 | 0.08 | 0.16 | 0.11 | 0.27 | 0.19 | 0.21 | 0.15 | 0.11 | 0.11 | 0.32 | 0.05 | 0.12 |
| **Average** | 0.15 | 0.11 | 0.09 | 0.16 | 0.09 | 0.25 | 0.23 | 0.12 | 0.19 | 0.14 | 0.17 | 0.25 | 0.12 | 0.07 |
| **Standard Deviation** | 0.02 | 0.06 | 0.02 | 0.02 | 0.01 | 0.03 | 0.07 | 0.04 | 0.04 | 0.05 | 0.04 | 0.08 | 0.03 | 0.04 |
| **C.V.** | 0.16 | 0.55 | 0.26 | 0.11 | 0.14 | 0.14 | 0.28 | 0.38 | 0.20 | 0.33 | 0.22 | 0.34 | 0.25 | 0.59 |

***Source: Computed***

****Aggregate NPR = (Profit after tax of all the sample companies taken together) ÷ (Total Income of all the sample companies taken together)***

*Analysis of the asset finance companies' financial performance in both the aggregate as well as individual unit levels, in terms of NPR (Net Profit Ratio):*

From Table 7.24 the following observations can be made on aggregative and company wise analysis levels in respect of NPR.

**Aggregative Analysis:** The NPR of the asset finance companies at the aggregative level reveals no specific trend. The ratio moves between 0.18 in 2010-11 and 0.11 in 2014-15 with an average of 0.15 and C.V. at 0.16.

**Company-wise Analysis:** On the average, DFL and CFL show the highest performance in terms of NPR (0.25) while CIFCL shows the lowest return in NPR (0.07) during the period under study. All the sample companies (except SEFL and CIFCL) have shown moderate fluctuations in NPR during the study period. Further, average performance in NPR of 6 sample companies (46.15%) out of 13 sample companies lies above the average performance in NPR (0.15) of the sample companies under study at the aggregative level.

**Table 7.25: Analysis of Current Ratio (CR) as Financial Performance Indicator of Selected Asset Finance Companies –Aggregative and Company wise**

| Year / Companies | Aggregate (All Sample Companies taken together)* | SEFL | MFL | SCUFL | SFL | DFL | IFL | GFL | MMFSL | LTFL | STFCL | CFL | ICL | CIFCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006-07 | 3.87 | 14.37 | 0.86 | 1.22 | 1.22 | 2.07 | 1.35 | 1.20 | 10.49 | 15.34 | 0.96 | 14.26 | 29.91 | 1.77 |
| 2007-08 | 3.39 | 16.05 | 0.72 | 2.88 | 1.06 | 2.20 | 1.32 | 1.05 | 10.89 | 1.00 | 0.99 | 13.97 | 29.80 | 1.50 |
| 2008-09 | 4.05 | 14.22 | 2.47 | 3.63 | 0.81 | 2.23 | 1.29 | 0.76 | 9.57 | 1.85 | 2.47 | 13.09 | 29.36 | 2.49 |
| 2009-10 | 2.91 | 6.71 | 2.16 | 2.48 | 1.39 | 2.32 | 1.32 | 0.48 | 9.76 | 1.95 | 1.52 | 13.86 | 29.36 | 1.61 |
| 2010-11 | 1.43 | 6.65 | 0.65 | 1.94 | 0.12 | 2.35 | 0.68 | 1.46 | 1.56 | 1.34 | 1.26 | 1.24 | 1.16 | 1.38 |
| 2011-12 | 1.31 | 1.10 | 0.77 | 2.29 | 0.08 | 2.32 | 0.65 | 1.72 | 1.53 | 1.48 | 1.35 | 1.25 | 1.08 | 1.03 |
| 2012-13 | 1.17 | 0.80 | 0.68 | 2.33 | 0.10 | 2.52 | 0.60 | 1.84 | 1.52 | 1.05 | 1.35 | 1.40 | 0.92 | 0.82 |
| 2013-14 | 1.20 | 0.76 | 0.60 | 2.66 | 0.13 | 2.24 | 0.86 | 2.04 | 1.56 | 0.96 | 1.52 | 1.61 | 1.07 | 0.89 |
| 2014-15 | 1.14 | 0.70 | 0.52 | 1.93 | 0.28 | 2.89 | 1.10 | 2.44 | 1.18 | 1.21 | 1.54 | 1.63 | 1.01 | 1.04 |
| **Average** | 2.27 | 6.82 | 1.05 | 2.37 | 0.58 | 2.35 | 1.02 | 1.44 | 5.34 | 2.91 | 1.44 | 6.92 | 13.74 | 1.39 |
| **Standard Deviation** | 1.26 | 6.52 | 0.73 | 0.68 | 0.54 | 0.24 | 0.32 | 0.63 | 4.60 | 4.68 | 0.44 | 6.53 | 15.05 | 0.53 |
| **C.V.** | 0.55 | 0.96 | 0.70 | 0.28 | 0.93 | 0.10 | 0.31 | 0.44 | 0.86 | 1.61 | 0.31 | 0.94 | 1.10 | 0.38 |

***Source: Computed***

****Aggregate CR = (Current Assets of all the sample companies taken together) ÷ (Current Liabilities of all the sample companies taken together)***

*Analysis of asset finance Companies' performance in terms of CR (Current Ratio):*

From the figures presented in the table 7.25 the following observations can be made on the companies taken together and also as individual companies so far as the performance of CR is concerned.

**Aggregative Analysis:** The CR of the aggregative asset finance companies reveal a fluctuating trend in the first three years under study and thereafter a decreasing trend (except in the year 2013-14) with an average of 2.27 which is higher than the standard norm of 2:1. The C.V. of CR is observed at 0.55.

**Company-wise Analysis:** The average performance of 7 companies in terms of CR (> 2.0) has been quite satisfactory since all these companies have performed better than the remaining companies. This implies that these companies have maintained higher level of liquidity during the period under study. On the average, the CR of ICL indicates the highest level of liquidity (13.74), while SFL shows the lowest level of liquidity (0.58). Further, from the above table, it is also observed that SEFL, MFL, SFL, MMFSL, LTFL, CFL, and ICL have experienced higher fluctuations in CR during the study period.

**Overall Observation of Ratio Analysis of Selected Performance Indicator of Selected Asset Finance Companies**:

The profitability performance in terms of ROA, ROCE, ROE, and NPR of the asset finance companies (in aggregate) is disappointing as they have experienced lower rates of returns during the study period. Moreover, no specific trend is observed in these cases. Similar results have been observed for each individual sample company under study.

So far as long term solvency is concerned, the asset finance companies (both in aggregative and company-wise) have relied more on internal liquidity than that of external debt in financing their assets. The short term solvency performance measured by CR showed higher level of liquidity maintained by the asset finance companies in aggregate. Furthermore, majority of the individual sample companies have also maintained a higher level of liquidity during the study period.

## 7.3 A COMPARISON OF THE AVERAGE PERFORMANCE OF THE FINANCIAL INDICATORS (RATIOS) BETWEEN SELECTED INVESTMENT COMPANIES (AGGREGATE) AND ASSET FINANCE COMPANIES (AGGREGATE)

The word comparison means the process of considering how things, entities, or aspects are similar and how they are different from each other.

Fisher's "t" test is generally used to test for equality of two means when population standard deviation is unknown and the sample size is small (i.e. less than 30). Basically, t-test is a method of inferential statistic applied to measure if there is any significant difference between the means of two groups, which may be associated in certain features.

This comparison helps to establish how likely the difference between the means occurred by chance or whether the data series really have basic difference(s). The t-test enquires whether the difference between the groups represents a factual difference of the study or not.

To find out the difference of means of selected performance indicators like ROA, ROCE, ROE, D/E Ratio, NPR, and CR between selected Investment Companies (aggregate) and selected Asset Finance Companies (aggregate), we employed "t" test.

**Table 7.26: Results of t-test for difference of mean of selected performance indicator (ratios) between selected Investment Companies (Aggregative) and Asset Finance Companies (Aggregative)**

| Performance Indicators | t-Value | Level of Significance | Results |
|---|---|---|---|
| ROA | -2.7308** | 5% | $H_0$ Rejected |
| ROCE | -0.5849*i* | 5% | $H_0$ Accepted |
| ROE | -4.2830*** | 1% | $H_0$ Rejected |
| D/E Ratio | -1.5858*i* | 5% | $H_0$ Accepted |
| NPR | -1.2578*i* | 5% | $H_0$ Accepted |
| CR | 0.2096*i* | 5% | $H_0$ Accepted |

***Source: Computed***

Notes:

i. *** indicates significant at 1% level (Two tailed)
ii. ** marked values indicates significant at 5% level (Two tailed)
*iii.* ***i*** marked value indicates insignificant
*iv.* d.f. = $(n_1 + n_2 - 2) = (5+13-2) = 16$

From Table 7.26, it is observed that the difference between the performances of the two sets of companies in terms of ROA is significant at 5% probability level. This implies that the ROA performance in aggregate is significantly different between investment companies and asset finance companies and it also leads to the rejection of the 2nd hypothesis *($H_{O2}$: There is no significant difference in the average financial performance between the selected Investment Companies and the Asset Finance Companies.)* that there has been significant difference in ROA performance between the different categories of NBFCs. This points out to the fact that the selected investment companies (aggregative) and asset finance companies (aggregative) have significant differences in managing their tangible fixed assets to generate profit although the nature of activities of NBFCs does not involve that much of impact in the volume of tangible fixed assets to run efficiently.

With respect to ROE, it is also found that the t-value is significant at 1% probability level which means that ROE performance is different between investment companies (aggregate) and asset finance companies (aggregate). This implies the rejection of the 2nd hypothesis *($H_{O2}$: There is no significant difference in the average financial performance between the selected Investment Companies and Asset Finance Companies.)* that there have been significant variations in ROE performance between the different categories of NBFCs. This result indicates that the selected investment companies (aggregative) and the asset finance companies (aggregative) have significant differences in accumulation of profit during the period under study.

So far as performance of ROCE, D/E Ratio, NPR, and CR is concerned the results are found to be insignificant; it leads to a situation of no variations in these performance indicators between investment companies (aggregate) and asset finance companies (aggregate). So it means the acceptance of the 2nd hypothesis *($H_{O2}$: There is no significant difference in the average financial performance between the selected Investment Companies and Asset Finance Companies)* that there have been no significant variations in ROCE, D/E Ratio, NPR, and CR performance between the different categories of NBFCs. This implies that both the categories of NBFCs have the same capital structure policy (represented by D/E Ratio) and short term liquidity (represented by CR). Moreover, both the categories of NBFCs have generated similar proportion of profit in terms of NPR and ROCE.

***Overall observations*:** The results of t-test show that out of the six selected performance indicators, only two performance indicators, namely, ROA and ROE are statistically significant and results of the rest four performance indicators (ROCE, D/E Ratio, NPR, and CR) are statistically insignificant. This shows that for majority of the

performance indicators selected under study considering the nature of NBFCs, there have been no differences in performance in terms of capital structure policy, short term solvency/liquidity, overall profitability, and net profit margin between the selected investment companies (aggregative) and the asset finance companies (aggregative), i.e., all the sample companies taken together although they are engaged in different financing activities.

**7.4 MEASURING DIFFERENCES IN THE AVERAGE PERFORMANCE OF THE PERFORMANCE INDICATORS (RATIOS) AMONG THE COMPANIES IN EACH CATEGORY OF NBFCS**

Variation means dispersion of the observations from the mean values. Analysis of variance (ANOVA) is a collection of statistical models and their related estimation procedures (such as the "variation" among and between groups) used to determine whether there are any significant differences between the means of several independent groups.

The technique to test for a difference in more than two independent means is an extension of the two independent samples procedure discussed previously (Fisher's "t" test) which applies when there are exactly two independent comparison groups. The ANOVA technique applies when there are two or more than two independent groups. ANOVA uses F-tests to statistically test the equality of means.

To examine whether there is any significant difference among the selected companies under each category of NBFCs, we have employed the technique of one-way ANOVA which follows F-distribution. For this purpose, we have examined the performance indicators which are indicated below.

The performance indicators, as identified for this study, are: Return on Assets (ROA), Return on Capital Employed (ROCE), Return on Equity (ROE), Debt-Equity Ratio (D/E Ratio), Net Profit Ratio (NPR), and Current Ratio (CR).

**7.4.1 One-way ANOVA with respect to selected Performance Indicators (Ratios) among the selected Investment Companies**

The following analyses will test the third null hypothesis of this study in terms of the performance of all the above indicators (ratios), group wise and individually, for both the categories of sample NBFCs i.e. Investment companies and Asset Finance Companies.

The third null hypothesis ($H_{03}$) is reproduced here: '*There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs'*.

**Table 7.27: One-way ANOVA : ROA (Investment Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 1489.986 | 4 | 372.496 | 10.034 | $F_{.05}$=2.61 |
| Within Groups | 1484.961 | 40 | 37.124 | | |
| Total | 2974.947 | 44 | | | |

***Source: Computed***

From Table 7.27 it is observed that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. This indicates that there is a significant difference in average performance with respect to ROA among the selected investment companies during the period under study. This also leads to the rejection of the 3rd null hypothesis of the study (*$H_{O3:}$ There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs.)*

**Table 7.28: One-way ANOVA : ROCE (Investment Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 0.025 | 4 | 0.006 | 2.843 | $F_{.05}$=2.61 |
| Within Groups | 0.087 | 40 | 0.002 | | |
| Total | 0.112 | 44 | | | |

***Source: Computed***

From Table 7.28 it is found that the table value of F is smaller than the observed value at of F at 5% level of significance. This means that the observed value of F falls in the critical region. Therefore, we reject the third null hypothesis (*$H_{O3:}$ There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs)* and accept the alternative hypothesis. This indicates that there are significant variations in average performance with respect to ROCE among the selected investment companies during the period under study. This leads to the rejection of the 3rd null hypothesis of the study.

**Table 7.29: One-way ANOVA : ROE (Investment Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 0.267 | 4 | 0.067 | 15.064 | $F_{.05}$=2.61 |
| Within Groups | 0.177 | 40 | 0.004 | | |
| Total | 0.443 | 44 | | | |

***Source: Computed***

Table 7.29 shows that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. This implies that there is a significant difference in the average performance with respect to ROE among the selected investment companies during the period under study. This results in the rejection of the 3rd null hypothesis of the study (*$H_{O3:}$*

*There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs).*

**Table 7.30: One-way ANOVA : D/E RATIO (Investment Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 166.159 | 4 | 41.540 | 13.649 | $F_{.05}$=2.61 |
| Within Groups | 121.734 | 40 | 3.043 | | |
| Total | 287.894 | 44 | | | |

***Source: Computed***

From Table 7.30 it is observed that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. Therefore, we reject the third null hypothesis ($H_{O3:}$ *There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs)* and accept the alternative hypothesis. This indicates that there is a significant difference in the average performance with respect to D/E RATIO among the selected investment companies during the period under study.

**Table 7.31: One-way ANOVA : NPR (Investment Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 2.101 | 4 | 0.525 | 27.245 | $F_{.05}$=2.61 |
| Within Groups | 0.771 | 40 | 0.019 | | |
| Total | 2.872 | 44 | | | |

***Source: Computed***

From Table 7.31 it is found that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. This implies that there is a significant variation in average performance with respect to NPR among the selected investment companies during

the period under study. This leads to the rejection of the 3rd null hypothesis of the study (*$H_{O3}$: There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs).*

**Table 7.32: One-way ANOVA : CR (Investment Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 91.691 | 4 | 22.923 | 3.486 | $F_{.05}$=2.61 |
| Within Groups | 263.005 | 40 | 6.575 | | |
| Total | 354.695 | 44 | | | |

***Source: Computed***

Table 7.32 states that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. Therefore, we reject the third null hypothesis (*$H_{O3}$: There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs)* and accept the alternative hypothesis. This implies that there is a significant difference in average performance with respect to CR among the selected investment companies during the period under study.

### 7.4.2 One-way ANOVA with respect to selected Performance Indicators (Ratios) among the selected Asset Finance Companies

**Table 7.33: One-way ANOVA : ROA (Asset Finance Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 1823.714 | 12 | 151.976 | 10.747 | $F_{.05}$=1.93 |
| Within Groups | 1470.678 | 104 | 14.141 | | |
| Total | 3294.392 | 116 | | | |

***Source: Computed***

From Table 7.33 it is observed that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. This indicates that there is a significant difference in average performance with respect to ROA among the selected asset finance companies during the period under study. This also leads to the rejection of the 3rd null hypothesis of the study (*$H_{O3:}$ There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs).*

**Table 7.34: One-way ANOVA : ROCE (Asset Finance Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 0.084 | 12 | 0.007 | 13.921 | $F_{.05}$=1.93 |
| Within Groups | 0.052 | 104 | 0.001 | | |
| Total | 0.136 | 116 | | | |

***Source: Computed***

From Table 7.34 it is found that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. Therefore, we reject the third null hypothesis (*$H_{O3:}$ There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs)* and accept the alternative hypothesis. This indicates that there is a significant difference in average performance with respect to ROCE among the selected asset finance companies during the period under study.

**Table 7.35: One-way ANOVA : ROE ( Asset Finance Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 0.213 | 12 | 0.018 | 13.716 | $F_{.05}$=1.93 |
| Within Groups | 0.135 | 104 | 0.001 | | |
| Total | 0.348 | 116 | | | |

***Source: Computed***

From Table 7.35 it is observed that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. This implies that there is a significant difference in respect of average performance with respect to ROE among the selected asset finance companies during the period under study. This signals to the rejection of the 3rd null hypothesis of the study (*$H_{O3}$: There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs).*

**Table 7.36: One-way ANOVA : D/E RATIO (Asset Finance Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 425.976 | 12 | 35.498 | 13.184 | $F_{.05}$=1.93 |
| Within Groups | 280.011 | 104 | 2.692 | | |
| Total | 705.987 | 116 | | | |

***Source: Computed***

Table 7.36 shows that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. Therefore, in case of D/E ratio also, we reject the third null hypothesis (*$H_{O3}$: There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs)* and accept the alternative hypothesis. This implies that there is a significant difference in

the average performance with respect to D/E RATIO among the selected investment companies during the period under study.

**Table 7.37: One-way ANOVA : NPR (Assets Finance Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 0.403 | 12 | 0.034 | 16.604 | $F_{.05}$=1.93 |
| Within Groups | 0.210 | 104 | 0.002 | | |
| Total | 0.613 | 116 | | | |

***Source: Computed***

From Table 7.37 it is found that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. This implies that there is a significant difference in respect of average performance with respect to NPR among the selected assets finance companies during the period under study. This again leads to the rejection of the 3rd null hypothesis of the study (*$H_{O3:}$ There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs).*

**Table 7.38: One-way ANOVA : CR (Asset Finance Companies)**

| | Sum of Squares | df | Mean Square | F (Observed value) | F (Table Value ) |
|---|---|---|---|---|---|
| Between Groups | 1505.686 | 12 | 125.474 | 4.568 | $F_{.05}$=1.93 |
| Within Groups | 2856.949 | 104 | 27.471 | | |
| Total | 4362.634 | 116 | | | |

***Source: Computed***

Table 7.38 states that the table value of F is smaller than the observed value of F at 5% level of significance. This means that the observed value of F falls in the critical region. Therefore, we reject the third null hypothesis while testing in respect of CR

(*$H_{O3}$: There have been no significant variations in the average performance with respect to performance indicators among the companies under each category of NBFCs)* and accept the alternative hypothesis. This implies that there is a significant difference in average performance with respect to ROE among the selected asset finance companies during the period under study.

**Table 7.39: Summary of One-way ANOVA Analysis with respect to selected Performance Indicators among the selected Investment Companies and Asset Finance Companies**

| Performance Indicator | Investment Companies | Asset Finance Companies |
|---|---|---|
| | Hypothesis ($H_{03}$) | Hypothesis ($H_{03}$) |
| ROCE | Rejected | Rejected |
| ROE | Rejected | Rejected |
| D/E RATIO | Rejected | Rejected |
| NPR | Rejected | Rejected |
| CR | Rejected | Rejected |

***Source: Computed***

***Overall observation*:** From Table 7.39 it is seen that there is significant difference in average performance (measured by ROA, ROCE, ROE, DER, NPR, and CR) among the selected companies. This implies that the performance of each individual selected companies have significant bearing on the performance of total sample companies taken together.

## 7.5 DETERMINING THE RELATIVE IMPORTANCE OF THE COMPANIES' PERFORMANCE INDICATORS CONTRIBUTING TO PROFITABILITY OF THE COMPANIES

***Factor Analysis:***

Generally, the number of independent variables used in predicting a response variable will be too many in real life situation. The difficulties in having too many independent variables in those cases can be avoided by using factor analysis. The aim of Factor analysis is to group the original input variables into factors which underlie the input variable. Each factor may account for one or more input variables. Theoretically, the total number of factors in the factor analysis is equal to the total number of input variables. But, after performing factor analysis, the total number of factors in the study can be reduced by dropping the insignificant factors based on certain criterion.

In our study, we have carried ratio analysis as explained in the previous section. The ratios selected in the study are as follows:

1. Return on Assets (ROA)
2. Return on Capital Employed (ROCE)
3. Return on Equity (ROE)
4. Net Profit Ratio (NPR)
5. Debt Equity Ratio (D/E Ratio), and
6. Current Ratio (CR).

Among the selected ratios, an attempt is made to carry out factor analysis with respect to selected profitability ratios (ROA, ROE, ROCE, and NPR) in order to identify the most important ratio or ratios that enhance the aggregate profitability performance of the selected companies under study.

The other two ratios, namely, D/E Ratio and CR, have not been considered since each of them as a single factor represent/explain the maximum variations under the category of capital structure and liquidity ratios respectively.

The following statistical tests have been carried out to find out the most important factor impacting the profitability of the companies.

### 7.5.1 Determining the Relative Importance of the Factor, i.e., the Ratios Impacting Profitability of the Investment Companies (Aggregate)

**Table 7.40: KMO and Bartlett's Test of Investment Companies (Aggregate)**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.750 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 33.346 |
| | Df | 6 |
| | Sig. | 0.000 |

***Source: Computed***

**Table 7.41: Total Variance Explained for Investment Companies (Aggregate) in Factor Analysis**

| Component | Initial Eigen Values | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3.529 | 88.215 | 88.215 | 3.529 | 88.215 | 88.215 |
| 2 | 0.352 | 8.788 | 97.003 | | | |
| 3 | 0.091 | 2.265 | 99.268 | | | |
| 4 | 0.029 | 0.732 | 100.000 | | | |

Extraction Method: Principal Component Analysis.

***Source: Computed***

**Table 7.42 : Component Matrix[a] of Investment Companies (Aggregate) in Factor Analysis**

| | Component |
|---|---|
| | 1 |
| ROA | 0.966 |
| ROCE | 0.905 |
| ROE | 0.900 |
| NPR | 0.983 |

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

***Source: Computed***

In Fcator Analysis, KMO & Bartlett's Test of Sphericity is used to measure the sampling adequacy. In most academic and business studies, KMO & Bartlett's test plays important roles to measure the sample adequacy. While the KMO ranges from 0 to 1, the widely accepted index is over 0.6. Here, the Bartlett's Test of Sphericity relates to the significance of the study and thereby shows the validity and suitability of the sample units. For Factor Analysis to be recommended suitable, the Bartlett's Test of Sphericity must be less than 0.05.

Table 6.40 shows that the KMO measure of sampling adequacy is 0.75 which is greater than 0.60 (KMO value of 0.60 is considered for small sample). The Chi square value is observed to be 33.346 which is statistically significant for 6 degree of freedom as per Bartletts test of Sphericity. Hence, the factor analysis is found to be useful in carrying out the analysis with respect to Investment Companies.

From Table 7.41 we find only one factor whose Eigen value is 3.529 and the percentage of variance explained by the factor comes to 88.215%.

From the component matrix (Table 7.42), NPR among the selected ratios for the selected factor has the highest component (0.983).

Therefore, from the above analysis it is found that NPR acts as the most important ratio that influences the aggregate profitability performance of the selected investment companies during the period under study.

### 7.5.2 Determining the Relative Importance of the Factor, i.e., the Ratios Impacting Profitability of the Asset Finance Companies (Aggregate)

**Table 7.43: KMO and Bartlett's Test of Asset Finance Companies (Aggregate)**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .262 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 14.481 |
| | Df | 6 |
| | Sig. | 0.025 |

***Source: Computed***

We have already discussed about the purpose of KMO & Bartlett's Test of Sphericity in factor analysis in our earlier section while carrying out the factor analysis of Investment Companies (Aggregative).

According to Table 7.43, the KMO measure of sample adequacy of performance indicators of selected Asset Finance Companies (Aggregative) is observed to be 0.262 (i.e. 26.2%). Hence the factor analysis with respect to performance indicator of Asset Finance Companies (Aggregative) can't be applied in the study since the KMO measure is less than 60%.

***Overall Observation***: on the whole, with respect to factor analysis of performance indicator of selected Investment Companies (Aggregative) and Asset Finance Companies (Aggregative), we found that NPR (Net Profit Ratio) is the major factor that drives the performance of Investment Companies (Aggregative) during the period under study. However, there is no such factor in case of Asset Finance Companies (Aggregative) since the factor analysis can't be applied in this regard.

## 7.6 EFFICIENCY MEASUREMENT OF SELECTED NON-BANKING FINANCING COMPANIES IN RESPECT OF SELECTED INVESTMENT COMPANIES AND ASSET FINANCE COMPANIES

Generally, efficiency means the ability to work well and produce good results by using the available time, money, supplies, etc. in the most effective way.

This measurement is based on basic linear algebra to find out the efficiency level of the NBFCs and to determine the factors responsible for this efficiency score. The analytical part runs through four steps to get the final result about the link between the financial status of the NBFCs and their respective efficiency score.

We have applied the method of Data Envelopment Analysis (DEA) to compare the selected NBFCs according to their physical performance.

DEA is a non-parametric method in operations research and economics for the estimation of production frontiers. It is used to measure productive efficiency of decision making units (or DMUs) empirically, here NBFCs. DEA is a methodology based upon an interesting application of linear programming. It was originally developed for performance measurement. It has been successfully employed for assessing the relative performance of a set of firms that use a variety of identical inputs to produce a variety of identical outputs.

In recent years, the multivariate statistical methods are used in DEA in order to increase the sensitivity of DEA. For an effective DEA analysis, the number of decision-making units should be at least three times the sum of inputs and outputs. When the sum of inputs and outputs is higher than three times the total number of decision-making units, discrimination power of DEA decreases. While using such data sets in a DEA analysis, Principal Component Analysis (PCA) can be used to reduce the number of input and output variables.

**Output Variables for DEA Analysis**

In our study we have taken the following three output performance parameters:

1. Return on Capital Employed (ROCE) which indicates the overall profitability of the DMUs;
2. Debt Equity Ratio (D/E Ratio) which indicates the Long Term Solvency of the DMUs;
3. Current Ratio (CR) which indicates the Short Term Solvency.

As we know that there are other profitability ratios such as Return on Assets (ROA), Return on Equity (ROE), and Net Profit Ratio (NPR) apart from ROCE but we have used only ROCE as output variable to measure the levels of efficiency of the DMUs. Following are the theoretical justifications for selecting ROCE as output variable from among all other profitability ratios for NBFCs under consideration.

**ROCE as a better performance evaluation criterion**

For any business organization established with the objective to earn profit, there are a number of tools to measure its performance, viz. Net Profit Ratio, Return on Operating Assets, Return on Total Assets, Return on Capital Employed, Return on Equity, and Return on Common Equity. Though all of the above measures indicate the performance of the business entity, they are not necessarily exact alternatives to one another; rather each one is useful in specific context, for example –

**Net Profit Ratio (NPR)** measures the return on turnover or revenue only**.**

**Return on Tangible Assets (ROA)** on the other hand measures its performance considering both operating and non-operating investments and hence may be of great use for the users in evaluating its overall performance.

**Return on Capital Employed (ROCE)** measures the performance of a firm based on its overall capital employed i.e. both owner's capital as well as debt capital. ROCE uses the net assets or capital employed as the denominator, instead of total assets as used in RAO. Capital Employed is the capital investment necessary for a business to function. It is commonly represented as total assets less current liabilities (or Fixed Assets + Working Capital). Normally the measure uses closing figures of capital; however, if the average of the opening and closing capital for the period is used, we obtain Return on Average Capital Employed (ROACE).

**Return on Equity (ROE)** measures the return on shareholders' fund and thus refers to the return achieved by the firm on its owners' contribution, taking preference shareholders also as the owners.

Though NPR, ROA, and ROE are commonly used as a performance evaluation tool, ROCE is always a better measure of performance in respect of measuring overall efficiency. This is because –

- NPR only measures excess of revenue over total cost as a percentage of sales and never provides any indication as to how efficiently the company has utilized its resources.
- ROA is also an inefficient measure as it does not take into consideration that due to adjustment needed for current liabilities, the effective investment of the company is much lower than its total investment in assets. Thus it is prone to show lower rate of return on investment.
- For companies which have significant amount of debt capital, ROE can never be an appropriate measure of overall performance as for them there is a high chance of profit being shown at a lower value in the event of any adverse situation in the

business conditions as debt brings a fixed charge on profit. In such a case, the company with higher debt will show a lower ROE as compared to a similar firm with relatively conservative capital structure, though both of them may have the same ROCE.

- A higher ROCE indicates more efficient use of capital. ROCE higher than the company's capital cost necessarily means that the company is creating value for shareholders.
- Companies may differ significantly in terms of their capital structure. In such cases comparing firms based on ROCE is more rational.
- Finally, NBFCs involve more debt capital in their capital structure and the same certainly differs from year to year. As a result, comparing their performance based on ROE is not suitable. Rather, a comparison based on ROCE may be a better option as an increasing ROCE will better represent their performance.

**Input Variables for DEA Analysis**

In our study, considering the nature of the NBFCs regarding the input variables, we have categorized inputs into two groups. One group contains non-revenue items contained in the balance sheet which can be termed as Financial Health Components (FHCs) and other group contains revenue items contained in the Profit and Loss A/C which can be called as Earning Components (ECs).

Following are the details of different input variables belonging to the two groups, namely, Financial Health Components (FHCs) and Earning Components (ECs).

**1) Financial Health Components (FHCs)**

i) Log of Short Term Loan (Assets) [LOGSTLA]

ii) Log of Long Term Loan (Assets) [LOGLTLA]

iii) Log of Short Term Loan (Liabilities) [LOGSTLL]

iv) Log of Long Term Loan (Liabilities) [LOGLTLL]

v) Log of Value of Investment [LOGVOI]

vi) Log of Net Worth [LOGNW]

vii) Log of Tangible Fixed Assets [LOGTFA]

viii) Log of Cash & Bank Balances [LOGCBB]

**2) Earning Components (ECs)**

i) Log of Interest Paid [LOGIP]

ii) Log of Total Revenue [LOGTR]

iii) Log of Employee Cost [LOGEC]

**Principal Component Analysis (PCA) for formation of new input variables**

There are two common methods of factor analysis: one is principal component analysis (PCA) and other is common factor analysis. General factor analysis involves the techniques to generate a smaller number of linear combinations on variables so that the generated reduced variables, finally considered for analysis, are able to explain maximum variance in a pattern of correlation matrix. PCA is a method of factor analysis which considers the total variance in the data set, which is not similar to the common factor analysis, and transforms the original variables into a considerably smaller data set of linear combinations.

Theoretically, PCA is a statistical technique that considers an orthogonal transformation to convert a set of observations of possibly correlated variables

(entities each of which takes on various numerical values) into a set of values of linearly uncorrelated variables called principal components (PC).

In our study, to reduce the number of inputs, we have applied the Principal Component Analysis (PCA) to derive the most important regulating financial parameters to influence the efficiency score of the NBFCs, derived from DEA. As stated above the PCA is basically a dimension-reduction technique that can be applied to reduce a large set of variables into a small set which still contains most of the information in the large set. It is a mathematical technique that transforms a good number of (possibly) correlated variables into a (smaller) number of uncorrelated variables called principal components. The generated first principal component shows as much of the variability in the data as possible, and each following component shows for as much of the remaining variability as possible. In this way, the minimum number of possible variables is determined, which have maximum effect on the physical efficiency score of the NBFCs.

We have applied PCA (one of the methods of Factor Analysis) of the above two groups, to select the new inputs and to carry out the DEA effectively.

### 7.6.1 FACTOR ANALYSIS (USING PCA METHOD) OF FINANCIAL HEALTH COMPONENTS (FHCs) OF SELECTED INVESTMENT COMPANIES AND ASSET FINANCE COMPANIES

The following tests have been conducted for this purpose:

**Table 7.44 : KMO and Bartlett's Test of Financial Health Components of Selected Investment Companies and Asset Finance Companies**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0.874 |
| Bartlett'sTest of Sphericity | Approx. Chi-Square | 251.660 |
| | Df | 28 |
| | Sig. | 0.000 |

***Source: Computed***

**Table 7.45 : Communalities of Financial Health Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| | Initial | Extraction |
|---|---|---|
| LOGSTLA | 1.000 | 0.907 |
| LOGLTLA | 1.000 | 0.901 |
| LOGSTLL | 1.000 | 0.964 |
| LOGLTLL | 1.000 | 0.978 |
| LOGVOI | 1.000 | 0.769 |
| LOGNW | 1.000 | 0.955 |
| LOGTFA | 1.000 | 0.874 |
| LOGCBB | 1.000 | 0.928 |
| Extraction Method: Principal Component Analysis. | | |

***Source: Computed***

The communalities of the financial health components (Table 7.45) is evidenced in the values of extraction. This communality among the factors leads us to carry out factor analysis to ultimately find the most important (or principal) factor having eigen value greater than one, explaining the maximum variations. (Shown in Table 7.46)

**Table 7.46: The Explained Variance of Financial Health Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| Component | Initial Eigen values | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 7.275 | 90.943 | 90.943 | 7.275 | 90.943 | 90.943 |
| 2 | 0.381 | 4.766 | 95.709 | | | |
| 3 | 0.149 | 1.866 | 97.575 | | | |
| 4 | 0.085 | 1.058 | 98.633 | | | |
| 5 | 0.058 | 0.731 | 99.364 | | | |
| 6 | 0.023 | 0.287 | 99.651 | | | |
| 7 | 0.019 | 0.236 | 99.887 | | | |
| 8 | 0.009 | 0.113 | 100.000 | | | |

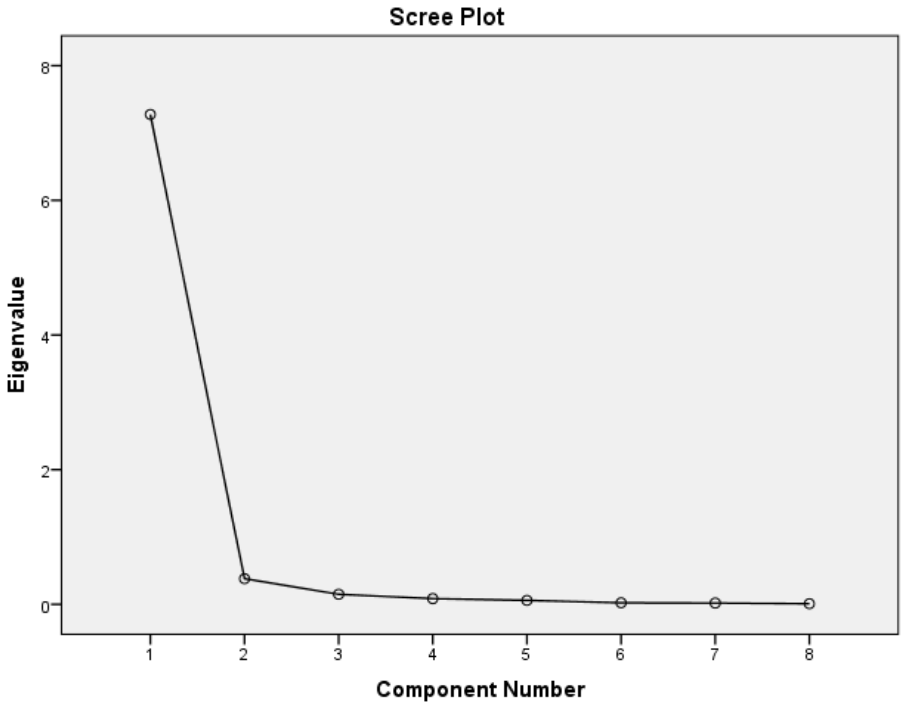
***Extraction Method: Principal Component Analysis.***
***Source: Computed***

From Table 7.44 we find that the KMO measure of sampling adequacy is 0.874 which is greater than 0.60 (Considering 0.60 KMO value as the benchmark as it is a small sample). The Chi square value is observed to be 251.660 which is statistically significant at 1% probability level for 28 degree of freedom as per Bartletts test of Sphericity. Hence, the factor analysis is found to be useful in carrying out the analysis with respect to Financial Health Components of selected Investment Companies and Asset Finance Companies.

From Table 7.46 we find only one input factor extracted whose Eigen value is 7.275 and the percentage of variance explained by the factor happens to be 90.943%, i.e., nearly 91% variability is accounted for by the first factor extracted.

Below is presented Scree Plot that shows the line segments representing the fraction of total variation in the variables of interest, explained by each principal component.

**Figure 7.1: Scree Plot of Financial Health Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**




The PCs are ordered, and by definition, they are assigned a number label each, in decreasing order of contribution to total variation. The scree plot is used to determine the number of factors to be retained in an exploratory factor analysis (FA) or principal components to be retained for final analysis. As per Figure 7.1, the Scree plot of Financial Health Components of Selected Investment Companies and Asset Finance Companies clearly shows that there is only one point of inflection; so only one component is extracted here with Eigen value greater than 1.

**Table 7.47**
**Component Score Coefficient Matrix of Financial Health Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| | Component |
|---|---|
| | 1 |
| LOGSTLA | 0.131 |
| LOGLTLA | 0.130 |
| LOGSTLL | 0.135 |
| LOGLTLL | 0.136 |
| LOGVOI | 0.121 |
| LOGNW | 0.134 |
| LOGTFA | 0.128 |
| LOGCBB | 0.132 |

***Extraction Method: Principal Component Analysis.***
***Source: Computed***

Figures presented in Table 7.47 represent the weights assigned to the financial health components of all the selected investment companies as well as asset finance companies. These weights will be used in constructing new input variable representing the financial health components as a whole.

### 7.6.2 FACTOR ANALYSIS (USING PCA METHOD) OF EARNING COMPONENTS (ECs) OF SELECTED INVESTMENT COMPANIES AND ASSET FINANCE COMPANIES

Following statistical tests (Tables 7.48 through 7.50) are carried out to identify the principal component(s) explaining maximum variation in the output variable.

**Table 7.48**

**KMO and Bartlett's Test of Financial Health Components of Selected Investment Companies and Asset Finance Companies**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0.777 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 106.665 |
| | Df | 3 |
| | Sig. | 0.000 |

***Source: Computed***

**Table 7.49**

**Communalities of Earnings Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| | Initial | Extraction |
|---|---|---|
| LOGIP | 1.000 | 0.991 |
| LOGTR | 1.000 | 0.989 |
| LOGEC | 1.000 | 0.982 |

Extraction Method: Principal Component Analysis.

***Source: Computed***

The communalities of the earnings components (Table 7.49) is evidenced in the values of extraction. This communality among the factors leads us to carry out factor analysis to ultimately find the most important (or principal) factor having eigen value greater than one, explaining the maximum variations. (Shown in Table 7.50)

**Table 7.50**

**The Explained Variance of Earnings Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| Component | Initial Eigen values | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.962 | 98.718 | 98.718 | 2.962 | 98.718 | 98.718 |
| 2 | 0.028 | 0.923 | 99.641 | | | |
| 3 | 0.011 | 0.359 | 100.000 | | | |

***Extraction Method: Principal Component Analysis.***
***Source: Computed***

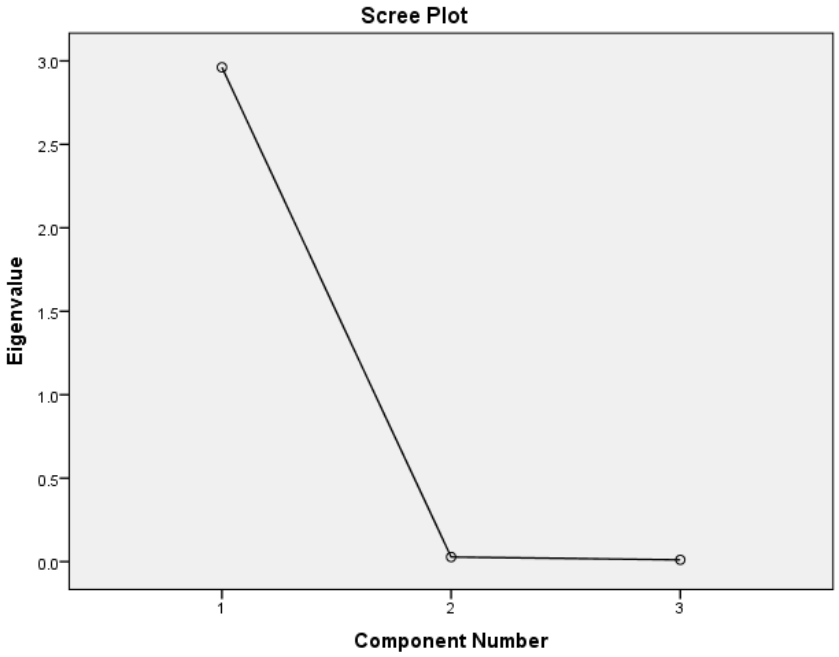
From Table 7.48 we find that the KMO measure of sampling adequacy is 0.777 which is greater than 0.60 (Considering 0.60 KMO value as benchmark as it is a small sample). The Chi square value is observed to be 106.665 which is statistically significant at 1% probability level for 3 degree of freedom as per Bartletts test of Sphericity. Hence, the factor analysis is found to be useful in carrying out the analysis with respect to the Earnings Components of selected Investment Companies and Asset Finance Companies.

From Table 7.50 we find only one input factor extracted whose Eigen value is 2.962 and the percentage of variance explained by the factor happens to be 98.718%.

Below is given a scree plot of earnings components on the basis of PCA.

**Figure 7.2**

**Scree Plot of Earnings Components of Selected Investment Companies and Assets Finance Companies in Factor Analysis**




As mentioned earlier, Scree Plot is a simple line segment plot that shows the fraction of total variance in the data as explained by each PC. The PCs are ordered, and by definition, are, therefore, assigned a number label, in decreasing order of contributions to the total variance. The scree plot is used to determine the number of factors to be retained in an exploratory factor analysis (FA) or principal components to be kept in a principal component analysis (PCA). The Scree plot of Earnings Components of Selected Investment Companies and Asset Finance Companies clearly shows that there is only one point of inflection, so only one component is extracted here with Eigen value greater than 1.

**Table 7.51**
**Component Score Coefficient Matrix of Earnings Components of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| | Component |
|---|---|
| | 1 |
| LOGIP | 0.336 |
| LOGTR | 0.336 |
| LOGEC | 0.335 |

***Extraction Method: Principal Component Analysis.***
***Source: Computed***

Table 7.51 shows the weights assigned to the earnings components of all the selected investment companies as well as asset finance companies. These weights will be used in constructing new input variable representing the earnings components as a whole.

### 7.6.3 FORMATION OF NEW INPUT VARIABLE EXTRACTED FROM PCA OF SELECTED INVESTMENT COMPANIES AND ASSET FINANCE COMPANIES

The new variables are formed with linear combination following the equations comprising the 1st variable ($X_i$) under the category of Financial Health Components (FHC) multiplying that by the corresponding weights ($W_i$) as derived from the Component Score Coefficient Matrix (Table 7.47) of PCA and 2nd variable ($Y_i$) under the category of Earnings Components, multiplied by the corresponding weights ($U_i$) as derived from the Component Score Coefficient Matrix (Table 7.51) of PCA.

The equations are stated as follows:

1st Input Variable -

$$FHC = \sum_{i=1}^{8} X_i W_i$$

Where,

$X_1$ = Log of Short Term Loan (Assets)

$X_2$=Log of Long Term Loan (Assets)

$X_3$=Log of Short Term Loan (Liabilities)

$X_4$=Log of Long Term Loan (Liabilities)

$X_5$=Log of Value of Investment

$X_6$=Log of Net Worth

$X_7$=Log of Cash & Bank Balances

$X_8$=Log of Tangible Fixed Assets

$W_i$s are the weights as derived in the Component Score Co-efficient Matrix (vide Table 7.47) corresponding to the $X_i$ values as stated above.

2nd Input Variable:

$$EC = \sum_{i=1}^{3} Y_i U_i$$

Where,

$Y_1$=Log of Interest Paid

$Y_2$=Log of Total Revenue

$Y_3$=Log of Employee Cost.

$U_i$s are the weights as shown in the Component Score Coefficient Matrix (Table 7.51) corresponding to the $Y_i$ values as stated above.

**Table 7.52**

**Formation of New Input Variables Extracted from PCA of Selected Investment Companies and Asset Finance Companies in Factor Analysis**

| Name of UNIT (DMUs) | Financial Health Components (FHC) | Earnings Components ( EC) |
|---|---|---|
| (1) | (2) | (3) |
| IC1-BACL | 3.602246 | 2.696323 |
| IC2-SCL | 0.549808 | 0.409951 |
| IC-3LTIDPL | 4.706602 | 3.794172 |
| IC4-REL | 5.711772 | 5.074937 |
| IC-5ILFSL | 5.858197 | 5.044705 |
| AFC1-SEFL | 5.666861 | 4.828496 |
| AFC2-MFL | 5.288135 | 4.702104 |
| AFC3-SCUFL | 5.346879 | 4.788648 |
| AFC4-SFL | 4.129099 | 3.613595 |
| AFC5-DFL | 2.175892 | 2.173383 |
| AFC6-IFL | 3.534525 | 3.025575 |
| AFC7-GFL | 2.23911 | 1.725174 |
| AFC8-MMFSL | 5.508346 | 5.015124 |
| AFC9-LTFL | 5.308667 | 4.651705 |
| AFC10-STFCL | 5.9232 | 5.232165 |
| AFC11-CCL | 2.800514 | 2.420991 |
| AFC12-ICL | 3.64526 | 3.474824 |
| AFC13-CIFCL | 5.309024 | 4.885302 |

***Source: Computed***

Table 7.52 shows the input variables representing financial health components and earnings components for each individual company(DMU). Each of these components in Column 2 and Column 3 is an aggregate value which represents all the components considered under financial health components and earnings components.

From the above it is concluded that we have now the two new input variables extracted from PCA and three output variables as explained earlier with 18 DMUs to carry out our DEA analysis effectively following the rule of thumb of DEA that the number of decision-making units should be at least three times the sum of inputs and outputs.

### 7.6.4 EFFICIENCY MEASUREMENT OF THE SELECTED NBFCs THROUGH DEA

Data envelopment analysis (DEA) is a nonparametric method used to empirically measure productive efficiency of decision making units (or DMUs).

Purpose of using DEA:

1. DEA compares decision making units considering all existing resources used and services provided, and identifies mainly efficient units or best practice units (branches, departments, individuals) and also identifies the inefficient decision making units in which real efficiency improvements are possible with existing combinations. It can be found by comparing the mix and volume of services provided and the resources used by each decision making unit as compared with those of all the other units. In short, DEA is a benchmarking technique for the inefficient units as compared to efficient ones.

2. DEA determines the combination of cost and resource and the amount of adjustments that can be made by each inefficient unit as compared to the efficient units.

3. Any changes required for the inefficient decision making units as identified, can be managed by implementing the potential adjustments located with DEA. Under this technique, the combinations of resources and cost of efficient units are treated as the

best practice unit in performance measurement. In addition, DEA also estimates the amount of further adjustment with existing resource combinations for inefficient unit, which provides increase in efficiency without the need to use additional resources.

4. The results of DEA provide information about performance of service units for management under a specific scenario. It is also used to help a transfer system of managerial skills from better-managed efficient units to the inefficient units. It also helps in improving productivity, reducing operating costs, and increasing profitability of the inefficient units.

The above outcomes of DEA information are extremely valuable in performance assessment because these outcomes identify the relationships of different input and output combinations for the efficient and inefficient units. This technique is more suitable and commonly used in the organizations which carry out the activities of providing services.

In our study, efficiency of the NBFCs in respect to the selected Investment Companies and Asset Finance Companies has been analyzed by following Convex Constant Max Average Input Oriented Model of DEA.

### 7.6.4.1 EFFICIENCY MEASUREMENT OF THE SELECTED INVESTMENT COMPANIES THROUGH DEA

**Table 7.53: Efficiency Scores of Selected Investment Companies**

| Sl. No. | DMU | Score | IFHC{I}{V}* | IEC{I} {V}* | ROCE{O}{V}* | DE{O}{V}* | CR{O}{V}* | DMU Category as per DEA |
|---|---|---|---|---|---|---|---|---|
| 1 | BACL | 70.16% | 0.2 | 0.2 | 0.1 | 0 | 0 | Inefficient |
| 2 | SCL | 100.00% | 0.22 | 0.39 | 0.57 | 0.01 | 0.04 | Efficient |
| 3 | LTIDPL | 65.70% | 0.2 | 0.2 | 0.06 | 0 | 0 | Inefficient |
| 4 | REL | 61.48% | 0.2 | 0.2 | 0 | 0 | 0.01 | Inefficient |
| 5 | ILFSL | 62.62% | 0.2 | 0.2 | 0.03 | 0 | 0 | Inefficient |

***Source: Computed***

**Indicates the virtual inputs which signify the linear equation coefficients.*

From Table 7.53 it is observed that only one DMU, i.e., for SCL, is efficient since its score is 100%. Any score less than 100% indicates the inefficient DMUs. Values less than 100% indicate the need to improve output variables by decreasing input levels. For inefficient DMUs i.e., 1-value as calculated, mean the percentage they need to improve their efficiency. It is found from the above table that the DMUs, namely, BACL, LTIDPL, REL, and ILFSL are inefficient DMUs. So now, it can be concluded that only one Investment Company out of five selected Investment companies is efficient and others are inefficient during the period under study.

**Table 7.54: The Efficiency Benchmarks of Investment Companies**

| Sl. No. | DMU | Benchmarks | {F} IFHC{I}* | {F} IEC{I}* | DMU Category as per DEA |
|---|---|---|---|---|---|
| 1 | BACL | 2 (1.67) | 25.45% | 25.36% | Inefficient |
| 2 | SCL | 4 | | | Efficient |
| 3 | LTIDPL | 2 (1.27) | 14.82% | 13.70% | Inefficient |
| 4 | REL | 2 (0.42) | 4.02% | 3.37% | Inefficient |
| 5 | ILFSL | 2 (0.75) | 7.02% | 6.08% | Inefficient |

***Source: Computed***

**Indicates the virtual inputs factors.*

In Table 7.54, Peer or reference set indicates an inefficient firm to follow as reference. For an inefficient DMU, the reference DMUs with corresponding intensities in brackets are given. It is the adjustment parameter for peer inefficient firms to become efficient. Peer weight is a value that can be followed for the respective reference firm as a virtual efficient one.

From Table 7.54 it is observed that 4 inefficient DMUs, namely, BACL, LTIDPL, REL, and ILFSL, have to follow one efficient DMU, namely, SCL. The inefficient DMU, BACL has to follow efficient DMU, i.e., SCL to become efficient in a proportion of 1.67 of virtual input of the efficient DMU by reducing its two inputs from their existing levels by 25.45% and 25.36% respectively.

Again, the inefficient DMU, namely, LTIDPL has to follow efficient DMU, i.e., SCL to become efficient in a proportion of 1.27 of virtual input of the efficient DMU by reducing its two inputs from their existing levels by 14.82% and 13.70% respectively. In respect of another inefficient DMU, REL has to follow efficient DMU, i.e., SCL to become efficient in a proportion of 0.42 of virtual input of the efficient DMU by reducing its two inputs from their existing levels by 4.02% and 3.37% respectively.

Finally, inefficient DMU for ILFSL has to follow efficient DMU which is SCL, to become efficient in a proportion of 0.75 of virtual input of the efficient DMU by reducing its two inputs from their existing levels by 7.02% and 6.08% respectively.

Now, we make a slack analysis in order to calculate the percentage change to be made in the outputs and in the proportion of the inputs so that the inefficient DMUs under consideration become efficient. The table 7.55 presents this information.

**Table 7.55: Slack Analysis of Investment Companies**

| Sl. No. | DMU | {S} ROCE{O} | {S} DE{O} | {S} CR{O} | DMU Category as per DEA |
|---|---|---|---|---|---|
| 1 | BACL | 0 | 8.64 | 6.25 | Inefficient |
| 2 | SCL | 0 | 0 | 0 | Efficient |
| 3 | LTIDPL | 0 | 6.79 | 3.96 | Inefficient |
| 4 | REL | 0.02 | 0.17 | 0 | Inefficient |
| 5 | ILFSL | 0 | 1.19 | 3.18 | Inefficient |

***Source: Computed***

Slack Analysis shows the model that is to be followed for the preferred and perceived output level to make them efficient. But the input remains same for the efficient firms. For each constant output, there must have been an efficient proportional input that are needed to be changed. Thus, slack gives the value of output variables for improvements.

From Table 7.55, it is also observed that there is no slack value of DMU for SCL as it is efficient. Slack value is observed only for inefficient DMUs.

In respect of inefficient DMU for BACL, there is no slack value for output ROCE. But it has to increase the output Debt-Equity (DE) by 8.64% and the output Current Ratio (CR) by 6.25% from their present performance level to become efficient. For inefficient DMU - LTIDPL, there is no slack value for output ROCE but it has to

increase the output DE by 6.79% and output CR by 3.96%, considering its present performance to become efficient. For the inefficient DMU – REL, there is no slack value for output CR but it has to increase the output ROCE by 0.02% and the output DR by 0.17%, considering its present performance to become efficient. Finally, for inefficient DMU – ILFSL, there is no slack value for the output ROCE but it has to increase the output DE by 1.19% and the output CR by 3.18%, considering its present performance to become efficient.

***Overall observation:*** From the above, it is observed that out of 5 selected Investment Companies, only one company is efficient and rests are inefficient. But there are enough scopes in respect of the inputs and outputs improvement parameters (Benchmarks and Slacks) to become efficient. It is also found that for most of the inefficient DMUs, the output ROCE need not be increased but the other outputs like DE and CR need to be increased to become efficient.

### 7.6.4.2 ANALYSIS OF EFFICIENCY MEASUREMENT OF THE ASSET FINANCE COMPANIES THROUGH DEA

**Table 7.56: Efficiency Scores of Asset Finance Companies**

| Sl. No. | DMU | Score | IFHC{I}{V}* | IEC{I} {V}* | ROCE{O}{V}* | DE{O}{V}* | CR{O}{V}* | DMU Category as per DEA |
|---|---|---|---|---|---|---|---|---|
| 1 | SEFL | 89.20% | 0.2 | 0.2 | 0 | 0.24 | 0.05 | Inefficient |
| 2 | MFL | 84.90% | 0.2 | 0.2 | 0.04 | 0.2 | 0 | Inefficient |
| 3 | SCUF | 91.13% | 0.2 | 0.2 | 0.05 | 0.25 | 0.01 | Inefficient |
| 4 | SFL | 86.31% | 0.2 | 0.2 | 0.07 | 0.19 | 0 | Inefficient |
| 5 | DFL | 100.00% | 0.48 | 0.42 | 0.76 | 0.1 | 0.03 | Efficient |
| 6 | IFL | 85.38% | 0.2 | 0.2 | 0.17 | 0.08 | 0 | Inefficient |
| 7 | GFL | 75.55% | 0.2 | 0.2 | 0.11 | 0.03 | 0.02 | Inefficient |
| 8 | MMFS | 88.30% | 0.2 | 0.2 | 0.05 | 0.2 | 0.03 | Inefficient |
| 9 | LTFL | 90.69% | 0.2 | 0.2 | 0.03 | 0.26 | 0.02 | Inefficient |
| 10 | STFC | 92.55% | 0.2 | 0.2 | 0.05 | 0.28 | 0 | Inefficient |
| 11 | CFL | 100.00% | 0.39 | 0.46 | 0.55 | 0.07 | 0.23 | Efficient |
| 12 | ICL | 100.00% | 0.41 | 0.51 | 0.06 | 0.36 | 0.5 | Efficient |
| 13 | CIFCL | 100.00% | 0.2 | 1.11 | 0.04 | 1.26 | 0.02 | Efficient |

***Source: Computed***

******Indicates the virtual inputs which signify the linear equation coefficients.*

From Table 7.56, it is found that only four DMUs, i.e., DFL, CFL, ICL, and CIFCL are efficient since they attain the score of 100%. Any score less than 100% indicates the inefficient DMUs. It has been found that the DMUs, namely, SEFL, MFL, SCUF, SFL, IFL, GFL, MMFS, LTFL, and STFC are inefficient DMUs. So it can now be concluded that only four Asset Finance Companies out of thirteen selected Asset Finance companies are efficient and others are inefficient during the period under study.

**Table 7.57: The Efficiency Benchmarks of Asset Finance Companies**

| Sl. No. | DMU | Benchmarks | {F} IFHC{I} | {F} IEC{I} | DMU Category as per DEA |
|---|---|---|---|---|---|
| 1 | SEFL | 12 (0.45) 13 (0.43) | 69.64% | 76.34% | Inefficient |
| 2 | MFL | 5 (0.23) 13 (0.51) | 60.77% | 63.72% | Inefficient |
| 3 | SCUF | 5 (0.07) 11 (0.19) 13 (0.65) | 76.95% | 78.71% | Inefficient |
| 4 | SFL | 5 (0.33) 13 (0.36) | 63.36% | 68.20% | Inefficient |
| 5 | DFL | 6 | | | Efficient |
| 6 | IFL | 5 (0.80) 13 (0.07) | 58.99% | 67.93% | Inefficient |
| 7 | GFL | 5 (0.13) 11 (0.16) 13 (0.01) | 35.50% | 42.27% | Inefficient |
| 8 | MMFS | 11 (0.25) 12 (0.22) 13 (0.45) | 70.49% | 71.00% | Inefficient |
| 9 | LTFL | 11 (0.10) 12 (0.10) 13 (0.63) | 74.89% | 78.55% | Inefficient |
| 10 | STFC | 5 (0.26) 13 (0.78) | 79.29% | 83.44% | Inefficient |
| 11 | CFL | 4 | | | Efficient |
| 12 | ICL | 3 | | | Efficient |
| 13 | CIFCL | 9 | | | Efficient |

***Source: Computed***

**Indicates the virtual input factors.*

From Table 7.57 it is found that 6 inefficient DMUs, namely, MFL (Sl. No. 2), SCUF (Sl. No. 3), SFL (Sl. No. 4), IFL (Sl. No. 6), GFL (Sl. No. 7), and STFC (Sl. No. 10), have to follow virtually the efficient DMUs, namely, DFL (Sl. No. 5). Again, 4 inefficient DMUs, namely, SCUF (Sl. No. 3), GFL (Sl. No. 7), MMFS (Sl. No. 8), and LTFL (Sl. No. 9) have to follow virtually the efficient DMU - CFL (Sl. No. 11). Three other inefficient DMUs, namely, SEFL (Sl. No. 1), MMFS (Sl. No. 8), and LTFL (Sl. No. 9) have to follow virtually the efficient DMU - ICL (Sl. No. 12). Lastly, 9 inefficient DMUs, namely, SEFL (Sl. No. 1), MFL (Sl. No. 2), SCUF (Sl. No. 3), SFL (Sl. No. 4), IFL (Sl. No. 6), GFL (Sl. No. 7), MMFS (Sl. No. 8), LTFL (Sl. No. 9), and STFC (Sl. No. 10) have to follow virtually the efficient DMU -

CIFCL (Sl. No. 13). Here it is also found that the inefficient DMU - SEFL (Sl. No. 1) virtually has to follow 2 efficient DMUs, namely, ICL (Sl. No. 12) and CIFCL (Sl. No. 13). The inefficient DMUs - MFL (Sl. No. 2), SFL (Sl. No. 4), IFL (Sl. No. 6) and STFC (Sl. No. 10) have to follow virtually 2 efficient DMUs, namely, DFL (Sl. No. 5) and CIFCL (Sl. No. 13). The inefficient DMUs - SCUF (Sl. No. 3) and GFL (Sl. No. 7) have to follow virtually 3 efficient DMUs, namely, DFL (Sl. No. 5), CFL (Sl. No. 11), and CIFCL (Sl. No. 13). The inefficient DMUs - MMFS (Sl. No. 8) and LTFL (Sl. No. 9) have to follow virtually 3 efficient DMUs, namely, CFL (Sl. No. 11), ICL (Sl. No. 12) and CIFCL (Sl. No. 13).

The inefficient DMU - SEFL (Sl. No: 1) has to follow virtually efficient DMUs - ICL (Sl. No. 12) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.45 of DMU - ICL (Sl. No. 12) and 0.43 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 69.64% and 76.34% respectively.

The inefficient DMU - MFL (Sl. No. 2) has to follow virtually efficient DMUs - DFL (Sl. No. 5) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.23 of DMU - DFL (Sl. No. 5) and 0.51 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 60.77% and 63.72% respectively.

The inefficient DMU - SCUF (Sl. No. 3) has to follow virtually efficient DMUs - DFL (Sl. No. 5), CFL (Sl. No. 11) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.07 of DMU - DFL (Sl. No. 5), 0.19 of DMU - CFL (Sl. No. 11) and 0.65 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 76.95% and 78.71% respectively.

The inefficient DMU - SFL (Sl. No. 4) has to follow virtually efficient DMUs - DFL (Sl. No. 5) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.33 of DMU - DFL (Sl. No. 5) and 0.36 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 63.36% and 68.20% respectively.

The inefficient DMU - IFL (Sl. No. 6) has to follow virtually efficient DMUs - DFL (Sl. No. 5) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.80 of DMU - DFL (Sl. No. 5) and 0.07 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 58.99% and 67.93% respectively.

The inefficient DMU - GFL (Sl. No. 7) has to follow virtually efficient DMUs - DFL (Sl. No. 5), CFL (Sl. No. 11) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.13 of DMU - DFL (Sl. No. 5), 0.16 of DMU - CFL (Sl. No. 11) and 0.01 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 35.50% and 42.27% respectively.

The inefficient DMU - MMFS (Sl. No. 8) has to follow virtually efficient DMUs - CFL (Sl. No. 11), ICL (Sl. No. 12), and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.25 of DMU - CFL (Sl. No. 11), 0.22 of DMU - ICL (Sl. No. 12), and 0.45 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 70.49% and 71.00% respectively.

The inefficient DMU - LTFL (Sl. No. 9) has to follow virtually efficient DMUs - CFL (Sl. No. 11), ICL (Sl. No. 12) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.10 of DMUs - CFL (Sl. No. 11), 0.10 of DMUs - ICL (Sl. No. 12),

and 0.63 of DMUs - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMU by reducing its two inputs comparing them to their existing levels by 74.89% and 78.55% respectively.

The inefficient DMU - STFC (Sl. No. 10) has to follow virtually efficient DMUs - DFL (Sl. No. 5) and CIFCL (Sl. No. 13) to become efficient in a proportion of 0.26 of DMU - DFL (Sl. No. 5) and 0.78 of DMU - CIFCL (Sl. No. 13) of virtual input combinations of these efficient DMUs by reducing its two inputs comparing them to their existing levels by 79.29% and 83.44% respectively.

Now we carry out slack analysis of asset finance companies with a view to calculating percentage changes of respective variables in the desired direction to become efficient.

**Table 7.58: Slack Analysis of Asset Finance Companies**

| Sl. No. | DMU | {S} ROCE{O} | {S} DE{O} | {S} CR{O} | DMU Category as per DEA |
|---|---|---|---|---|---|
| 1 | SEFL | 0.01 | 0 | 0 | Inefficient |
| 2 | MFL | 0 | 0 | 0.2 | Inefficient |
| 3 | SCUF | 0 | 0 | 0 | Inefficient |
| 4 | SFL | 0 | 0 | 0.7 | Inefficient |
| 5 | DFL | 0 | 0 | 0 | Efficient |
| 6 | IFL | 0 | 0 | 0.95 | Inefficient |
| 7 | GFL | 0 | 0 | 0 | Inefficient |
| 8 | MMFS | 0 | 0 | 0 | Inefficient |
| 9 | LTFL | 0 | 0 | 0 | Inefficient |
| 10 | STFC | 0 | 0 | 0.25 | Inefficient |
| 11 | CFL | 0 | 0 | 0 | Efficient |
| 12 | ICL | 0 | 0 | 0 | Efficient |
| 13 | CIFCL | 0 | 0 | 0 | Efficient |

***Source: Computed***

It has been mentioned above that slacks give the percentage change of the respective variables in desired directions to become an efficient one in the given technology framework.

From Table 7.58 it is observed that there is no slack value for DMUs - DFL (Sl. No. 5), CFL (Sl. No. 11), ICL (Sl. No. 12), and CIFCL (Sl. No: 13) as these are efficient DMUs. Generally, slack values are observed only for inefficient DMUs.

In respect of inefficient DMU - SEFL (Sl. No. 1), there is no slack value for the outputs DE and CR; but to become efficient, it has to increase the output ROCE by 0.01% considering its present performance.

For inefficient DMU - MFL (Sl. No. 2), there is no slack value for the outputs ROCE and DE; but to become efficient, it has to increase the output CR by 0.20% considering its present performance.

For the inefficient DMU - SFL (Sl. No. 4), there is no slack value for the outputs ROCE and DE; but to become efficient, it has to increase the output CR by 0.70% considering its present performance.

The inefficient DMU - IFL (Sl. No. 6): There is no slack value for the outputs ROCE and DE; but to become efficient, it has to increase the output CR by 0.95% considering its present performance.

Finally, the inefficient DMU - STFC (Sl. No. 10): There is no slack value for the outputs ROCE and DE; but it has to increase the output CR by 0.25% considering its present performance, to become efficient.

It is also observed that there are 4 inefficient DMUs, namely, SCUF (Sl. No. 3), GFL (S. No. 7), MMFS (Sl. No. 8), and LTFL (Sl. No. 9) and for them, no slack values are found for the output. It implies that these inefficient DMUs need not adjust their outputs but only need to pay attention to the use of its inputs as exhibited in Table

7.55 (The Efficiency Benchmarks of Asset Finance Companies) to become efficient DMUs.

***Overall observation:*** From the above, it is observed that out of 13 selected Asset Finance Companies, only 4 companies are efficient and rests are inefficient in the situation given here by the recorded input-output combination. But there is certain scope in respect of inputs and outputs improvement parameters (Benchmarks and Slacks) to become efficient. It is also found that all the inefficient DMUs, except one inefficient DMU, namely SEFL, need not change the outputs ROCE and DE, but the other output CR need to be increased to become efficient, although it is applicable only for 4 inefficient DMUs. Most of the adjustments are needed only for input factors considering the benchmarks for the inefficient DMUs to become efficient.

## 7.7 RELATIONSHIP BETWEEN SELECTED INVESTMENT COMPANIES AND ASSET FINANCE COMPANIES AND THEIR EFFICIENCY SCORES

A cross-tabulation is made to determine if there is a relationship between two variables with respect to their outcomes. When conducting efficiency measurement, cross tabulation is a technique used in qualitative research. This type of analysis is crucial in finding underlying relationships within results in respect of efficiency measurement. To make cross tabulation analysis, we need to compute odds ratio. The odds ratio is the proportion of happening and no happening. The odds ratio is computed as follows:

Odds Ratio = ln (P/1-P) [‘ln’ means Natural Log in respect of logistic regression]

Where, P= Favorable Cases (i.e., Efficient DMUs), and

(1-P) = Non favorable Cases. (i.e., Inefficient DMUs.)

If we consider the dummy variable 1 (one) for efficient DMU and 0 (zero) for the inefficient DMUs, then the Odds ratio shows [1 (efficient) / 0 (inefficient)] proportions. It can also be interpreted as the ratio of probability of success of the target group and the probability of success of the non-target group.

The NH (Null Hypothesis) is accepted if the odds ratio =1 (It represents that probability of being efficient = 50% and portability of not being efficient = 50%).

If it (odds ratio) is greater than 1, then NH will be rejected and it can be concluded that the chance of being efficient is greater.

In our study, we have carried out a cross tabulation analysis to find out the relationship, if there be any, between selected Investment Companies (IC) and Asset Finance Companies (AFC) and between their efficiency scores, as derived by DEA during the period under study.

**Table 7.59: Case Processing Summary of Cross Tabulation Analysis between selected ICs and AFCs and their Efficiency Score**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| DMU * SCORE | 18 | 100.0% | 0 | 0.0% | 18 | 100.0% |

***Source: Computed***

The case processing summary shows the missing values of the cross tabulation analysis. Missing values arrive if we are unable to measure the efficiency of any DMUs selected in our study. In our study, there is no missing value, which implies that all the cases are valid. From Table 7.59 it is observed that no missing values are there for the cross tabulation analysis between the selected ICs and AFCs and between their efficiency scores.

**Table 7.60: DMU * SCORE Cross tabulation analysis between selected IC and AFC and their efficiency score**

| Count | | | | |
|---|---|---|---|---|
| | | SCORE | | Total |
| | | Inefficient | Efficient | |
| DMU | IC | 4 | 1 | 5 |
| | AFC | 9 | 4 | 13 |
| Total | | 13 | 5 | 18 |

***Source: Computed***

**Table 7.61: Calculation of Odd Ratios of the companies from Table 7.60**

| Cases | Value of Odd Ratio |
|---|---|
| Odds Ratio of AFC | 0.44 |
| Odds Ratio of IC | 0.25 |
| Overall Odds Ratio | 1.77 |

***Source: Computed***

From Tables 7.60 and 7.61, it is observed that probability of being efficient by AFCs is, in general, 1.77 times that of IC in the given input-output framework.

So from the above, it can be concluded that the chance of becoming efficient by the selected AFCs is more than those of the selected ICs.

## 7.8 OVERALL EFFICIENCY MEASUREMENT OF THE SELECTED INVESTMENT COMPANIES AND ASSET FINANCE COMPANIES

In this section, we make an attempt to measure the overall efficiency of the non-banking financing companies using Stochastic Frontier Analysis (SFA).

SFA is a technique of economic modeling. Frontier means regression line. The SFA model is developed by the theoretical idea that no economic agent can exceed the ideal "frontier", and deviations from this extreme represent individual inefficiencies. From the statistical point of view, this idea has been implemented by specifying a

regression model characterized by a composite error term in which the classical idiosyncratic disturbance (strange) is incorporated with a one-sided disturbance that represents inefficiency. In case of the cross-sectional or panel data, production or cost frontier, time invariant or changeable inefficiency, the parametric SF models are generally estimated by likelihood-based methods. The main objective of the same is to build the inference about both frontier parameters and inefficiency.

In our study, we have already carried out the DEA. Then a question may be raised why SFA is employed when DEA has already been made to measure the level of efficiency or inefficiency of the companies. To address this question the basic differences between DEA and SFA need to be discussed. This is done below:

i. DEA is a non-parametric model which means no functional forms are required. But, SFA is parametric model which means functional forms are required.

ii. DEA doesn't need any assumptions about data, while SFA needs some assumptions about data.

iii. DEA models don't have error term. This means that the DEA models do not include unobserved variables, which might have explained a part of the total variations in the output or dependent variables. The SFA models, on the other hand, have error term or residual (stochastic) that measures the effect of the variables that are left out of explicit consideration in the model.

In DEA, we have analyzed the company-wise efficiency including their benchmark and considered slacks to make them virtually efficient during the study period. SFA, on the other hand, is a time oriented model which is also useful in measuring efficiency. It, however, unlike DEA, identifies the factors that explain efficiency of the DMUs under the given input and output combinations for which it is efficient or

inefficient. It captures the effect of external random factors on efficiency or inefficiency levels of the DMUs. Under SFA, we can determine the factors of efficiency and inefficiency, as a whole, of the two selected categories of NBFCs. We can also determine the overall efficiency level and the percentage change in input and/or output to become efficient. Here, we have considered the input oriented model of SFA.

The NBFCs basically form a part of the service sector. The management of Financial Health Components (FHC), which has been discussed earlier in DEA analysis is the key for measuring efficiency of the NBFCs and its long run sustainability. The FHC also includes various regulatory measures set by the RBI from time to time with respect to short term and long term borrowings, short term and long term loans given, net worth, and investments. After proper management of FHC, the NBFC can look after the management of financial indicators, namely, ROCE (which indicates overall profitability), DE (which indicates long term solvency), and CR (which indicates short term solvency) to perform the financial services more efficiently. Since earnings in the short run is not the sole objective of the NBFCs, the Earnings Components (ECs) which have been discussed earlier in DEA analysis impact indirectly the performance of the NBFCs provided the management of FHCs is found to be adequate.

According to our study, in SFA analysis, FHCs are considered as primary deterministic variables which are affected by ROCE, DE, and CR while ECs are considered as external stochastic impulse factor.

We have employed the SFA model in respect of selected Investment Companies (ICSs) to measure the overall efficiency and the factors determining the efficiency and

inefficiency under the given input and output combinations which are presented in Tables 7.62 and 7.63.

**Table 7.62: SFA Results of Selected Investments Companies (Through Unrestricted Model)**

| True fixed-effects (truncated-normal) Input Oriented model | | | | Number of observations : 45 | | |
|---|---|---|---|---|---|---|
| Group variable: ID of ICs* | | | | Number of groups : 5 | | |
| Time variable: YEAR | | | | Observations per group: min 9 | | |
| | | | | avg = 9.0 | | |
| | | | | max =9 | | |
| | | | | Prob > $chi^2$ = 0.0000 | | |
| Log likelihood = -19.2468 | | | | Wald chi2 (4) = 81.31 | | |
| **FHC (Dep.)** | **Coefficient** | **Std. Err.** | **z** | **P>\|z\|** | **[95% Conf. Interval]** | |
| ***Frontier*** | | | | | | |
| ROCE | 3.249343 | 1.691989 | 1.92 | 0.049 | -0.0668931 | 6.56558 |
| DE | 0.1743949 | 0.0536123 | 3.25 | 0.001 | 0.0693167 | 0.2794732 |
| CR | -0.1457235 | 0.0379823 | -3.84 | 0.000 | -0.2201675 | -0.0712796 |
| YEAR | 0.0011867 | 0.0002668 | 4.45 | 0.000 | 0.0006638 | 0.0017095 |
| $\mu_u$ | | | | | | |
| EC | -0.0767714 | 0.0772208 | -0.99 | 0.0320 | -0.2281214 | 0.0745786 |
| Constant | 0.4293602 | | | | | |
| $\sigma_u$ | | | | | | |
| Cons | -21.76984 | 1322.121 | -0.02 | 0.987 | -2613.079 | 2569.539 |
| $\sigma_v$ | | | | | | |
| Cons | -1.981577 | 0.2215052 | -8.95 | 0.000 | -2.415719 | -1.547434 |
| sigma_u | 0.0000187 | 0.0123874 | 0.00 | 0.999 | 0 | 0 |
| sigma_v | 0.3712839 | 0.0411207 | 9.03 | 0.000 | 0.2988363 | 0.4612952 |
| Lambda | 0.0000505 | 0.0445526 | 0.00 | 0.999 | -0.087271 | 0.0873719 |

***Source: Computed***

*Note: * ID of ICs: IC1-BACL, IC2-SCL, IC3-LTIDPL, IC4-REL and IC5-ILFSL*

The SFA model can be written as:

$$y_i = \alpha + x_i'\beta + \varepsilon_i, \quad \text{where } i = 1, \ldots, N \text{ and } \varepsilon_i = v_i - u_i$$

where, $y_i$ represents the logarithm of the output of the $i^{th}$ productive unit, $x_i$ is a vector of inputs, and $\beta$ is the vector of technology parameters (Coefficient of $x_i$ ). The error term (an external stochastic impulse), $\varepsilon_i$, is the difference of $v_i$ (represents specification error, and a one-sided disturbance) and $u_i$, (represents technical inefficiency).

In the above SFA analysis, the estimated trend equation for the Investment Companies is given by

FHC= 0.429 + 3.249ROCE+0.1743DE - 0.145CR (-) 0.0767EC

Where, FHC is the primary deterministic variable to determine the financial health of the DMUs, which is affected by ROCE, DE, CR, and an external stochastic impulse, i.e., Earnings Components (EC) is applied to show the change in efficiency of the respective DMUs with the corresponding change in EC.

In the equation, 0.429 is the constant, 3.249 is the coefficient of ROCE, 0.1743 is the coefficient of DE, -0.145 is the coefficient of CR, and (-) 0.0767 is the coefficient of EC.

From Table 7.62, the values of sigma U and sigma V are related variance due to stochastic impulse (EC) on the variables that have been estimated, and it is seen that such stochastic impulse can affect the efficiency of the DMUs.

Table 7.62 states that p value of the output variables, namely, ROCE, DE, and CR are less than 0.05, which indicates that all these are statistically significant at 5% or less than 5% probability levels. It implies that these output variables have significant impact in making the selected ICs efficient. Z value is the calculated value of test parameter, which is tested with the tabulated value and from this, the p value is calculated. But, here the coefficient under SFA model is positive for ROCE (3.249343) and DE (0.1743949) and negative for CR. It implies that if ROCE and DE

increase, then performance will increase and, higher will be the probability for the ICs to become efficient. These results are in conformity with the theoretical assertion that increase in ROCE is favourable as it indicates the overall profitability and higher DE ratio implies effective management of the external fund. As we observe that the coefficient of CR is negative (-0.1457235), it indicates that an increase in CR will result in decrease in efficiency of the selected ICs.

$\mu_u$ (i.e., a change in one unit of the EC) shows the impact on the level of inefficiency when EC is changed by a DMU. As per Table 7.62, the $\mu_u$ coefficient of Earnings Components (ECs) is negative (-0.0767714). It implies that if ECs increase, then inefficiency will decrease in the case of the ICs. This means that efficiency will increase as EC increases.

**Table 7.63: Overall Efficiency Level of Selected Investments Companies (Through SFA)**

| Variable | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Efficiency | 45 | **0.9018073** | 0.0724439 | 0.7539303 | 0.9999995 |

***Source: Computed***

Table 7.63 indicates that the mean value of the overall average efficiency of the selected ICs is 0.90. They (i.e., ICs) can increase their efficiency levels by 10% with the existing input-output combinations to become efficient. Low variances (i.e., standard deviation) show that there are very little variations in the existing efficiency level among the selected ICs.

Now we have employed the SFA model in respect of selected Asset Finance Companies (AFCs) to measure the overall efficiency and the factors determining the efficiency and inefficiency under the given input and output combinations. The results are shown in Tables 7.64 and 7.65.

**Table 7.64: SFA Results of Selected Asset Finance Companies (Through Unrestricted Model)**

| True fixed-effects (truncated-normal) Input Oriented model | | | | Number of observations:117 | | |
|---|---|---|---|---|---|---|
| Group variable: ID of AFCs* | | | | Number of groups:13 | | |
| Time variable: YEAR | | | | Observations per group: min 9 | | |
| | | | | avg = 9.0 | | |
| | | | | max =9 | | |
| | | | | Prob >chi$^2$ = 0.0000 | | |
| Log likelihood = -14.6694 | | | | Wald chi2 (4) = 128.03 | | |
| **FHC (Dep.)** | **Coefficient** | **Std. Err.** | **z** | **P>\|z\|** | **[95% Conf. Interval]** | |
| ***Frontier*** | | | | | | |
| ROCE | 2.12771 | 2.381476 | 0.89 | 0.372 | -2.539897 | 6.795317 |
| DE | -0.0740795 | 0.0240376 | -3.08 | 0.002 | -0.1211923 | -0.0269668 |
| CR | -0.0389456 | 0.0065197 | -5.97 | 0.000 | -0.051724 | -0.0261672 |
| YEAR | 0.0011442 | 0.0312936 | 0.04 | 0.971 | -0.0601901 | 0.0624785 |
| $\mu_u$ | | | | | | |
| EC | -0.1994511 | 0.0115791 | -17.23 | 0.0001 | -0.2221457 | -0.1767565 |
| Constant | 1.035987 | | | | | |
| $\sigma_u$ | | | | | | |
| Cons | -12.95171 | 22.3217 | -0.58 | 0.562 | -56.70143 | 30.79801 |
| $\sigma_v$ | | | | | | |
| Cons | -2.574276 | 0.3362554 | -7.66 | 0.000 | -3.233324 | -1.915227 |
| sigma_u | 0.0015402 | 0.0171897 | 0.09 | 0.929 | 4.8713 | 4.871955 |
| sigma_v | 0.2760598 | 0.0464133 | 5.95 | 0.000 | 0.1985604 | 0.3838077 |
| Lambda | 0.0055792 | 0.0496601 | 0.11 | 0.911 | -0.0917529 | 0.1029112 |

***Source: Computed***

*Note: IDs of AFCs: AFC1-SEFL, AFC2-MFL, AFC3-SCUF, AFC4-SFL, AFC5-DFL, AFC6-IFL, AFC7-GFL, AFC8-MMFS, AFC9-LTFL, AFC10-STFC, AFC11-CFL, AFC12-ICL and AFC13-CIFCL.*

In the above SFA analysis (Table 7.64), the trend equation of Assets Finance Companies is given below

FHC= 1.0359 + 2.1277 ROCE - 0.074 DE - 0.0389 CR (-) 0.1994 EC

where FHC is the primary deterministic variable used to determine the financial health of the DMUs which is affected by ROCE, DE, CR, and an external stochastic impulse, i.e., Earnings Components (ECs). The model shows the change in efficiency of the respective DMUs with the corresponding change in EC.

In the equation, 1.0359 is the constant, 2.1277 is the coefficient of ROCE, 0.074 is the coefficient of DE, 0.0389 is the coefficient of CR, and 0.1994 is the coefficient of EC.

From Table 7.64, the values of sigma U and sigma V are related variance due to stochastic impulse (EC) on the variables that are derived and it is seen that such impulse has affected the efficiency of the DMUs.

Table 7.64 states that the p value of output variable 'ROCE' is more than 0.05. So, it is statistically insignificant, i.e., it is not a significant variable to determine the efficiency. The P values of DE and CR are less than 0.05 which are statistically significant. It implies that only two output variables (i.e., DR and CR) have significant impact in making the selected AFCs efficient, and the other output variable 'ROCE' is not having that significant impact in making the selected AFCs efficient. Z value is the calculated value of the test parameter, which is tested with the tabulated value and from this, the p value is calculated. However, the coefficient of the output variable 'ROCE' under SFA model is positive and the coefficients are negative for DE and CR. Theoretically, it is known to us that an increase in ROCE is favourable as it indicates the overall profitability. However, the results found that it has no significant impact in becoming efficient. As the coefficients are negative in case of DE (-0.0740795) and CR (-0.0389456), it may be stated that if DE and CR increases, the efficiency will decrease for the selected AFCs. Theoretically, higher DE ratio implies effective management of the external fund but too high is not desirable as it

involves high risk. As the coefficient of CR is negative, it indicates that an increase in CR will also result in decrease the efficiency of the selected AFCs. Thus, the results obtained from this SFA model conform to our expectations and, therefore, they are accepted without reservations.

$\mu_u$ (i.e., a change in one unit of the EC) shows the impact on the level of inefficiency when EC is changed by a DMU. In Table 7.64, the coefficient (-0.1994511) of the other input variable i.e., Earnings Components (ECs) is negative. It implies that if EC increases, then inefficiency will decrease for the selected AFCs. This implies that efficiency will increase as EC increases.

**Table 7.65: Overall Efficiency Level of Selected Asset Finance Companies (Through SFA)**

| Variable | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Efficiency | 117 | 0.6555378 | 0.2485469 | 0.2685073 | 0.9999211 |

***Source: Computed***

Table 7.65 indicates that the mean value of the overall average efficiency of the selected AFCs is 0.65. They (i.e., AFCs) can increase their efficiency level by 35% with the existing input-output combinations to become efficient. Higher variances (i.e., standard deviation) show that there are higher variations in the existing efficiency level among the selected AFCs.

***Overall Observation:*** The probability of $Chi^2$ values for the SFA analysis of the selected ICs and AFCs are zero. So, the model can be regarded as a stable one. From the above analysis, it is observed that the input variable 'EC' has an impact as a stochastic impulse on efficiency level for the selected ICs and AFCs since the ***s***tochastic impulse affects the overall efficiency. The overall mean efficiency of the

selected ICs and the AFCs are less than 100% level: in the case of ICs it is 0.9018 and in the case of AFCs it is 0. 65553. Therefore, it can be said that there is a possibility to increase the level of efficiency by 10% in the case of the ICs (Table 7.63) and 35% for the AFCs (Table 7.65) with the existing level of inputs. As the coefficient of ROCE is found to be positive for both the categories of companies, i.e., ICs and AFCs, efficiency will increase for the selected ICs and AFCs. From the variation analysis (measured by standard deviation) for overall efficiency of the selected ICs and AFCs, it can be concluded that the exiting level of efficiency varies more widely among the AFCs (0.24) than among the ICs (0.072).

### 7.9 *References*

1. Annual Reports of the Selected Investment Companies (from 2006-07 to 2014-15).
2. Annual Reports of the Selected Asset Finance Companies (from 2006-07 to 2014-15).