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Impact of LBO on Operating Performance of Select companies

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Abstract:

The current study investigates the operating performance of the select companies which have undergone Leveraged Buyout (LBO) during the period 2005-06 to 2015-16. A sample of eleven companies has been taken into consideration for measuring the performance. Control sample methodology has been adopted as there is industrial effect on the sample companies. Two variables namely, Pre-interest Return on Sales (ROS) and pre-interest Return on Assets (ROA) have been used to measure the operating performance of the sample companies. It is found that there is improvement in operating performance of the sample companies with respect to its matching control companies in the post LBO period. Control companies have been selected on the basis of category of industry, size of the company in terms of turnover, market capitalization, capital employed, nature of the business undertaken by the company etc. Paired sample t test has been applied to determine whether the computed results are statistically significant or not. After analyzing the computed results it is found that there is statistically significant improvement in operating performance after LBO.

Key Words: Operating Performance, Leveraged Buyout (LBO), Private equity, ROS, ROA,

1. Introduction: Leveraged buyout (LBO) is that type of acquisition, when a company is acquired by means of a relatively small portion of equity and a relatively large portion of outside debt financing [Kaplan and Stromberg (2009)]. According to Jensen (1989) LBO firms have highly leveraged capital structures, active corporate governance, concentrated ownership stakes, and well-aligned managerial incentives. Different scholars [namely, Kaplan (1989), Litchenberg and Siegel (1989), Smith (1990), Muscarella and Vetsuypens (1990), Opler (1992), Kaplan, S. N., & Stein, J. C. (1993), Smart and Waldfogel (1994), Cohn, J. B., Hotchkiss, E. S., & Towery, E. (2020). etc.] have observed that the performance of firms undergoing LBOs has improved. These authors have shown reduction in wasteful expenditure following buyout. They have also shown that there are a few changes in employment, research and development expenditure, maintenance expenditure after LBO. Other authors [namely, Healey, Palepu and Ruback (1990] have discovered improvement in assets efficiency following merged firms. However, an opposite view that LBOs lead to very few improvements to operating performance has been noticed in the studies of Palepu (1990), Phan and Hill (1995), Holthausen and Larcker (1996), Guo, Hotchkiss, Song (2011) and Cohn, Mills, and Towery (2014) etc. Long and Ravenscraft (1993) have found that operating profit margin decline by 2% after LBO. Another study by Kaplan (1989) and Smith (1990) has shown that capital expenditure decline after LBO. In this backdrop the present unit sheds light on the impact of leveraged buyout on operating performance in the Indian scenario. By operating performance we mean that performance of firm which is related to the operating activities of the firm. Thus it is primarily associated with the principal revenue-producing activities of the enterprise. A business with excellent operating performance can generate a high level of sales with relatively few resources, and generates a high level of cash inflows [Cohn Jonathan B. (2013). In this unit the impact of leveraged buyout has been measured and examined with the help of control sample methodology as there is industrial on the sample companies. Besides, this unit also explains the determinants of operating performance of the select LBO firms in the Indian context.

2. Objectives of the study

The main objective of the study is to measure the change in operating performance of the Indian Companies which have undergone leveraged buyout (LBO) by comparing its matching control companies. Beside, the other objectives are:

1) To find out the pre-interest Return on Sales (ROS) of the sample companies along with its matching control companies in order to determine the change in operating performance before and after LBO period.
2) To compute the pre-interest Return on Assets (ROA) of the sample LBO companies and its matching control companies thereby comparing the results between pre-LBO and post LBO period.

3. Hypothesis of the study

The following hypotheses have been formulated to test the statistical significance of various analyses.

H0: There is no significant difference between the Pre-interest ROS of pre-LBO period and post

LBO period of sample companies and control companies.

H_1: There is significant difference between the Pre-interest ROS of pre-LBO period and post LBO period of sample companies and control companies.

H0: There is no significant difference between the Pre-interest ROA of pre-LBO period and post LBO period of sample companies and control companies.

H_1: There is significant difference between the Pre-interest ROA of pre-LBO period and post LBO period of sample companies and control companies.

4. Data Base and Methodology

The study is based on financial data procured from secondary sources mainly from corporate financial reporting including published annual reports of the selected companies, Bombay Stock Exchange Directory and other reliable and authentic sources. According to the objectives of the study, the selected companies are listed either on Bombay Stock Exchange or on National Stock Exchange. The firms selected are widely held and securities of these firms are frequently traded. The Capitaline Data Base package 2000 has also been contemplated to procure data required for the study. The books and Journals and related websites carrying relevant theories and articles have also been consulted to enrich the analysis. Data have been collected from the Profit and Loss Account and Balance Sheet of the concerned companies for different years over the study period. The basic data which have been collected for analysis of sample companies under various divisions during the entire study period are net operating profit after tax, capital employed, amount of interest, Total assets excluding fictitious assets, turnover, gross sales, etc. corporate tax rate at different years have been collected from the website of Income Tax Authority, Government of India. Analysis has been done for a total of twenty two companies operating under different sectors viz auto-ancillaries, Tea, Coffee, Pharmaceutical, power, Beverage, steel, detergent, etc. Seven years have been selected for the study where three years have been for post-LBO period (denoted by (t+1), (t+2) and (t+3)) and three years have been for pre-LBO period (denoted by (t-1), (t-2) and (t-3)). So far as the measurement of operating performance is concerned, we have taken eleven sample LBO companies along with its matching control companies during the year 2002-03 to 2018-19. Control companies have been chosen according to size, capital employed, market capitalization, line of business, etc.

For measuring the operating performance of the sample companies two variables have been taken which are (1) Pre-interest Return on Sales (ROS) [Cohn et al. (2014)]. It is the ratio which is used to measure how efficiently the firm runs its business operation to generate maximum sales so that it can earn highest profit. We have computed pre-interest ROS by using the following formula-

$$\text{Pre-interest ROS} = \frac{\textit{Earnings Before Interest and Taxes}}{\textit{Gross Sales}} * 100$$

The higher pre-interest ROS ratio indicates that higher level of operating performance of the companies. It also indicates high level of efficiency of the firm. Thus we have concentrated on pre-interest Return on Assets (ROA) [Cohn et al. (2014)]. It is a measure which is used to determine how efficiently the firm manages its assets in order to generate income. We have calculated the pre-interest ROA using the following formula-

$$\text{Pre-interest ROA} = \frac{\textit{Pre-interest Income}}{\textit{Lagged Total Assets}} * 100$$

The higher the ratio of pre-interest ROA indicates higher level of operating performance as well as efficiency of the companies. Pre-interest income has been taken because our interest to study operating performance before financing. Thus we have applied control sample methodology for measuring the operating performance of the selected sample LBO companies by comparing the computed results of its matching control companies. Under control sample methodology, we have compared the value of Pre-interest ROS and Pre-interest ROA of the sample companies and its matching control companies before one to three years of LBO with after one to three years of LBO. In our study, year t represents the year of LBO. One, two and three years before LBO are represented by (t-1), (t-2) and (t-3) respectively. Similarly one, two and three years after LBO are represented by (t+1), (t+2) and (t+3) respectively. For the purpose of comparing the data of pre and post LBO period we have calculated mean, median and coefficient of variation (CV) on the two variables namely pre-interest ROS and pre-interest ROA in order to determine operating performance. If Pre-interest Return On Sales (ROS) and Pre-interest Return on Assets (ROA) of sample company exhibit higher value in the post LBO period than that of pre LBO period and control companies disclose lower value in the post LBO period in contrast to that of pre LBO period, it indicates improvement in operating performance of the sample LBO firm and vice versa. For better understanding we have represented the result of mean, median and CV of eleven sample companies along with matching control companies by pie chart in order to make a comparison between the two. Then we have applied paired t test on the two variables before and after LBO period to determine whether the results of two periods is statistically significant or not. If the result is significant in case of sample LBO companies and insignificant in case of control companies, then it is considered that there is improvement in operating performance of the sample companies after LBO and vice versa. In the following sub-sections, we have discussed the computed results of the sample companies and its matching control companies.

5. Summary of major findings

Table 1: Pre interest ROS of the Sample and control Companies for both Pre and Post LBO period

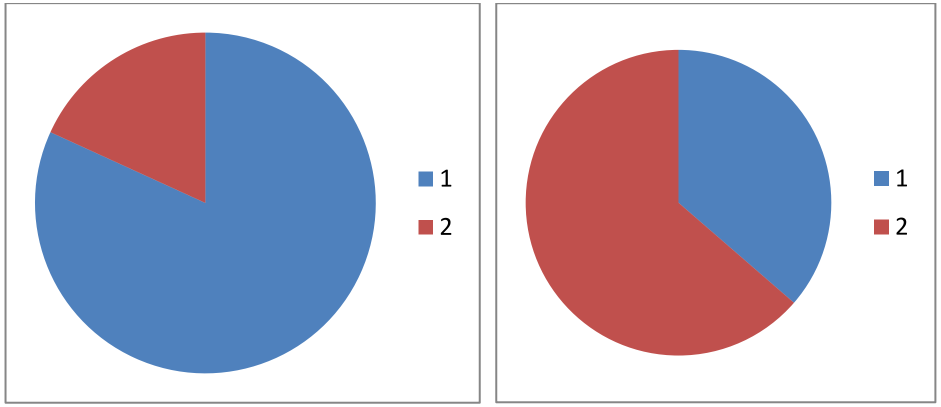
Name of company	Pre Interest ROS							Pre LBO Period			Post LBO Period		
	(t-3)	(t-2)	(t-1)	t	(t+1)	(t+2)	(t+3)	Mean	Median	CV	Mean	Median	CV
Hindalco	23.9	22.21	20.96	20.71	20.98	20.93	22.58	22.36	22.21	6.60	21.50	20.98	4.37
National Aluminium	37.51	47.72	50.85	61.69	50.67	39.44	24.53	45.36	47.72	15.38	38.21	39.44	34.32
UB Group	12.2	14.2	15.7	16.34	15.92	15.8	14.8	14.03	14.2	12.51	15.51	15.8	3.97
Radico Khaitan	13.48	13.02	15.5	12.87	10.97	9.86	15.02	14.00	13.48	9.42	11.95	10.97	22.73
Tata Steel	18.4	27.03	38.13	35.77	37.31	40.68	41.72	27.85	27.03	35.51	39.90	40.68	5.78
JSW Steel	33.92	30.66	26.9	27.14	26.15	10.81	20.43	30.49	30.66	11.52	19.13	20.43	40.52
United Spirits	7.12	5.99	11.04	27.08	19.69	18.11	17.4	8.05	7.12	32.92	18.4	18.11	6.37
Radico Khaitan	13.48	13.02	15.5	12.87	10.97	9.86	15.02	14	13.48	9.42	11.95	10.97	22.73
Tata Motors	9.27	11.59	10.94	11.56	11.95	11.64	11.32	10.6	10.94	11.29	11.64	11.64	4.58
Maruti Suzuki	8.93	12.28	14.73	15.77	14.32	8.44	12.46	11.98	12.28	24.30	11.74	12.46	25.60
Dr. Reddys Lab	28.89	18.52	3.68	14.38	35.84	18.2	24.4	17.03	18.52	74.40	26.15	24.4	34.23
Sun Pharma	31.99	31.51	27.8	29.75	28.95	33.54	33.62	30.43	31.51	7.53	32.04	33.54	8.34
Suzlon Energy	22.7	22.04	22.62	25.27	22.69	22.81	22.13	22.45	22.62	1.60	22.54	22.69	1.61
NTPC	24.91	49.07	34.7	32.24	33.37	32.83	27.05	36.23	34.7	33.54	31.08	32.83	11.27
United phosporus	19.08	17.44	16.85	18.33	19.57	16.03	17.31	17.79	17.44	6.50	17.64	17.31	10.16
Pidilite Industries	16.56	14.62	14.36	14.9	14.15	15.7	11.46	15.18	14.62	7.92	13.77	14.15	15.58
Aban Offshore	29.87	38.3	37.56	40.71	44.3	46.74	66.57	35.24	37.56	13.25	52.54	46.74	23.25
Reliance Industries	14.29	14.92	15.99	14.32	14.06	18	14.21	15.07	14.92	5.70	15.42	14.21	14.48
Tata Coffee	15.93	15.27	18.16	17.76	16.06	17.1	17.57	16.45	37.56	9.20	16.91	17.1	4.57
Tata Global Beverage	17.24	17.94	19.84	25.49	27.47	29.79	22.81	18.34	17.94	7.34	26.69	27.47	13.32
Nirma Ltd	8.68	14.39	14.06	8.28	19.52	19.39	17.95	12.38	14.06	25.90	18.95	19.39	4.60

Tamilnadu Petro	3.05	-3.18	-2.22	-5.46	7.55	7.63	7.97	-0.78	-2.22	-428.21	7.72	7.63	2.89

Table 2: Summary Result of Change in Pre interest ROS of Sample companies and Control Companies

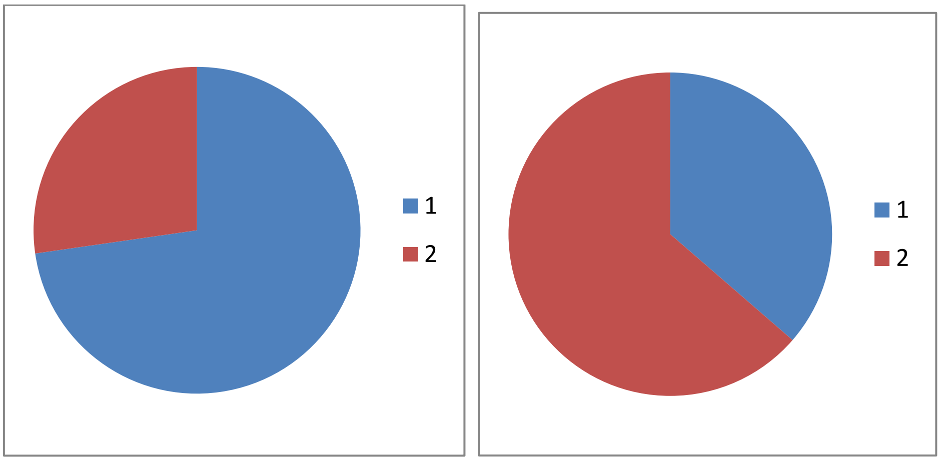
	Sample Companies						Control Companies					
Change in ROS	**Mean**	**% change in Mean**	**Median**	**% Change in Median**	**CV**	**% change in CV**	**Mean**	**% change in Mean**	**Median**	**% Change in Median**	**CV**	**% change in CV**
Increase in ROS	9	81.82	8	72.73	3	27.27	4	36.36	4	36.36	9	81.82
Decrease in ROS	2	18.18	3	27.27	8	72.73	7	63.64	7	63.64	2	18.18
Total	11	100.00	11	100.00	11	100.00	11	100.00	11	100.00	11	100.00

Figure 1: Change in mean pre-interest ROS of the sample and control companies



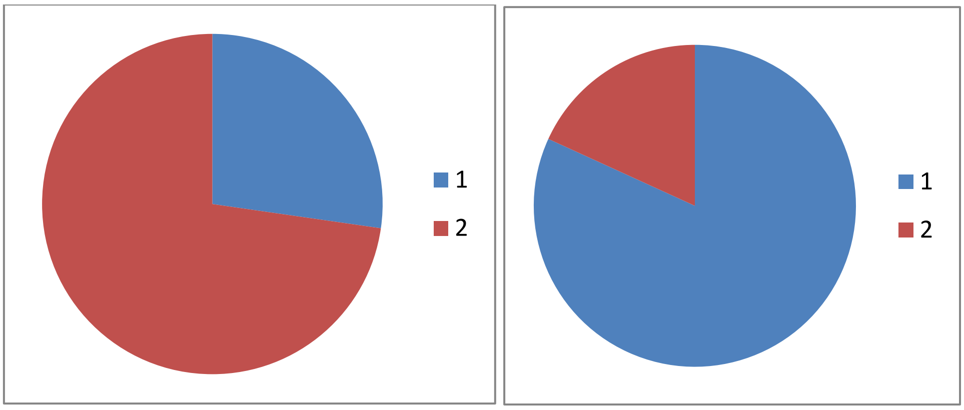
Where No.1 indicates increase in mean on pre-interest ROS and No.2 indicates decrease in mean on pre-interest ROS.

Figure 2: Change in median pre-interest ROS of the sample and control companies



Where No.1 indicates increase in median on pre-interest ROS and No.2 indicates decrease in median on pre-interest ROS.

Figure 3: Change in CV pre-interest ROS of the sample and control companies



Where No.1 indicates increase in CV on pre-interest ROS and No.2 indicates decrease in CV on pre-interest ROS

Table 3: Results of Paired Sample t test on pre-interest ROS sample and control companies at pre-LBO and post-LBO period

Time Window	Variables	Mean	t
Pre LBO to post LBO	Sample Mean ROS$_{(pre\ LBO)}$	18.57	-2.802**
	Sample Mean ROS$_{(post\ LBO)}$	23.79	
Pre LBO to post LBO	Control Mean ROS$_{(pre\ LBO)}$	20.94	0.539
	Control Mean ROS$_{(post\ LBO)}$	19.97	

Notes: ** implies significant at 5% level.

Table 4: Pre interest ROA of the Sample and control Companies for both Pre and Post LBO period

Name of company	Pre Interest ROA							Pre LBO Period			Post LBO Period		
	(t-3)	(t-2)	(t-1)	t	(t+1)	(t+2)	(t+3)	Mean	Median	CV	Mean	Median	CV
Hindalco	16.57	22.01	20.33	25.82	24.38	22.19	16.54	19.64	20.33	14.19	21.04	22.19	19.23
National Aluminium	25.3	44.38	52.46	62.22	32.86	22.64	12.69	40.71	44.38	34.25	22.73	22.64	44.37
UB Group	11.07	11.85	11.28	11.89	12.87	11.29	11.57	11.4	11.28	3.54	11.91	11.57	7.08
Radico Khaitan	23.69	25.24	23.61	15.56	10.46	8.62	13.33	24.18	23.69	3.80	10.80	10.46	21.97
Tata Steel	39.03	69.97	48.58	53.07	56.53	54.18	49.43	52.53	48.58	30.16	53.38	54.18	6.78
JSW Steel	16.58	30.98	23.9	27.47	30.56	9.95	19.34	23.82	23.9	30.23	19.95	19.34	51.72
United Spirits	12.72	11.64	25.93	30.57	29.98	24.77	17.08	16.76	12.72	47.47	23.94	24.77	27.10
Radico Khaitan	23.69	25.24	23.61	15.56	10.46	8.62	13.33	24.18	23.69	3.80	10.80	10.46	21.97
Tata Motors	36.86	36.55	35.52	34.71	38.6	37.92	16.05	36.31	36.55	1.93	30.86	37.92	41.57
Maruti Suzuki	22.88	34.35	37.78	41.95	34.24	18.54	36.1	31.67	34.35	24.64	29.63	34.24	32.56
Dr. Reddys Lab	29.71	16.76	2.71	12.29	44.5	12.73	14.35	16.39	16.76	82.37	23.86	14.35	74.99
Sun Pharma	47.36	42.19	28.58	17.12	20.22	30.06	30.12	39.38	42.19	24.64	26.8	30.06	21.26
Suzlon Energy	27.55	46.9	38.7	56.54	57.84	38.58	30.16	37.72	38.7	25.75	42.19	38.58	33.63
NTPC	11.8	20.7	15.19	14.56	16.71	16.66	14.22	15.90	15.19	28.26	15.86	16.66	8.97
United phosporus	4.65	37.58	17.88	18.37	18.58	18.98	18.37	20.04	17.88	82.70	18.64	18.58	1.66
Pidilite Industries	31.19	30.47	30.08	32.27	34.88	38.49	17.63	30.58	30.47	1.84	30.33	34.88	36.75
Aban Offshore	18.93	23.84	23.93	21.25	22.76	21.83	27.03	22.23	23.84	12.87	23.87	22.76	11.62
Reliance Industries	13.95	15.43	19.02	19.57	21.92	26.24	17.11	16.13	15.43	16.16	21.76	21.92	20.99
Tata Coffee	11.44	13.16	13.58	15.41	14.37	14.16	13.69	12.73	13.16	8.91	14.07	14.16	2.47
Tata Global Beverage	10.81	11.47	15	19.89	28.18	9.29	12.12	12.43	11.47	18.13	16.53	12.12	61.63
Nirma Ltd	7.05	10.92	6.28	17.81	18.49	19.32	10.01	8.08	7.05	30.76	15.94	18.49	32.32
Tamilnadu Petro	-7.15	-4.23	-10.97	15.18	21.8	20.45	18.71	-7.45	-7.15	-45.369	20.32	20.45	7.62

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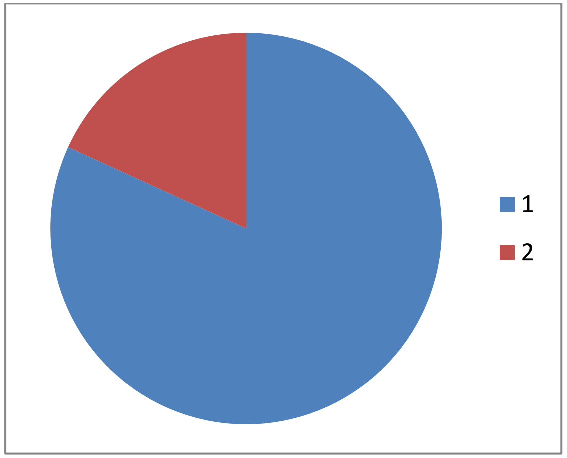
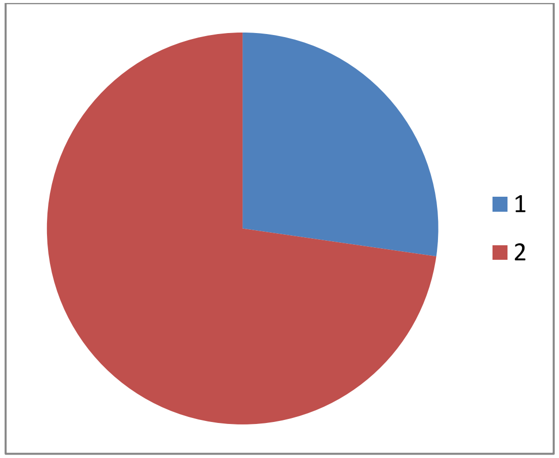
Table 5: Summary Result of Change in Pre interest ROA of Sample companies and Control Companies

	Sample Companies						Control Companies					
Change in ROS	**Mean**	**% change in Mean**	**Median**	**% Change in Median**	**CV**	**% change in CV**	**Mean**	**% change in Mean**	**Median**	**% Change in Median**	**CV**	**% change in CV**
Increase in ROS	9	81.82	8	72.73	5	45.45	3	27.27	5	45.45	9	81.82
Decrease in ROS	2	18.18	3	27.27	6	54.55	8	72.73	6	54.55	2	18.18
Total	11	100.00	11	100.00	11	100.00	11	100.00	11	100.00	11	100.00

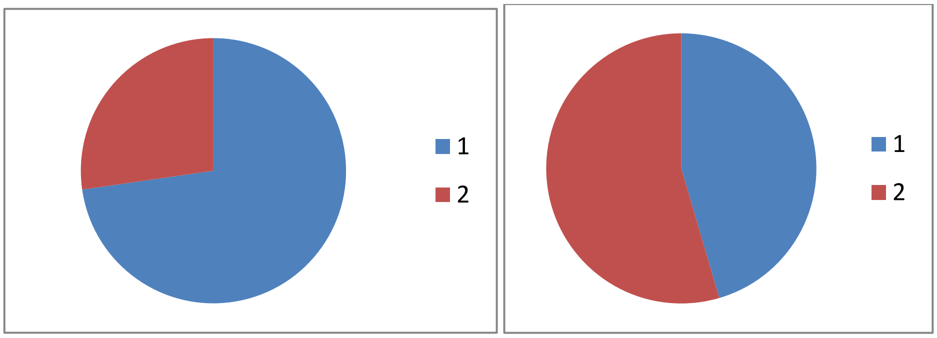
Figure 4: Change in mean pre-interest ROA of the sample and control companies





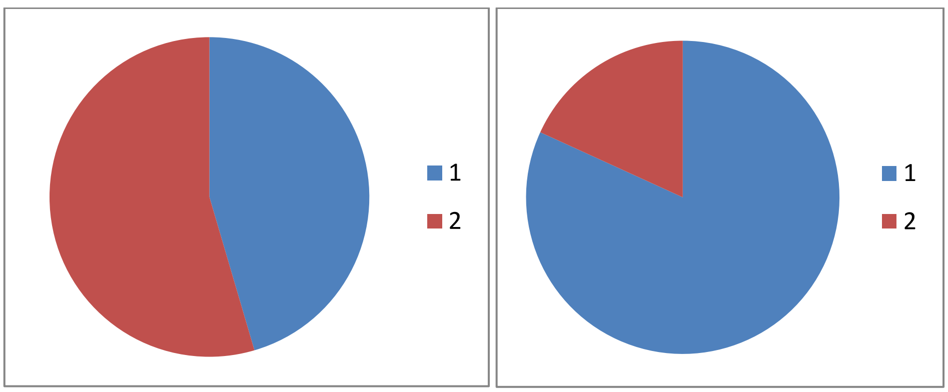
Where No.1 indicates increase in mean on pre-interest ROA and No.2 indicates decrease in mean on pre-interest ROA

Figure 5: Change in median pre-interest ROA of the sample and control companies



Where No.1 indicates increase in median on pre-interest ROA and No.2 indicates decrease in median on pre-interest ROA.

Figure 6: Change in CV pre-interest ROA of the sample and control companies



Where No.1 indicates increase in CV on pre-interest ROA and No.2 indicates decrease in CV on pre-interest ROA

Table 6: Results of Paired t test result on mean pre-interest ROA of sample companies and control companies pre LBO and post LBO period

Window	Variable	Mean	t
Pre LBO to Post LBO	Sample mean $ROA_{(pre\ LBO)}$	23.08	-1.91*
	Sample mean $ROA_{(post\ LBO)}$	25.43	
Pre LBO to Post LBO	Control mean $ROA_{(pre\ LBO)}$	22.87	.536
	Control mean $ROA_{(post\ LBO)}$	20.50	

Note: * implies significant at 10% level.

6.1 Interpretation of Results on Pre-interest ROS of Sample Companies and Control Companies

6.1.1 Hindalco Industries and National Aluminium

From Table 1 it is observed that post LBO mean (21.16), median (20.93), CV (6.22) of pre-interest ROS of Hindalco industries has decreased in contrast to that of pre LBO period. On the other hand similar results have been noticed in case of control company, national Aluminium just like as Hindalco Industries. It indicates that there is poor operating performance for both the companies after LBO period. Even operating performance of the sample company, Hindalco Industries has been noticed in the post LBO period as compared to pre LBO period from the CV point of view as the result has decreased in post LBO period. Whereas National Aluminium has shown poor operating performance in the post LBO period as its CV has increased in the post LBO period in contrast to that of pre LBO period.

6.1.2 UB Group and Radico Khaitan

It is evident from Table 1 that mean and median pre-interest ROS of UB Group has increased in post LBO period in contrast to that of pre LBO period which indicate post LBO improvement in operating performance of UB Group as a result of LBO. Radico Khaitan, the control company has shown the opposite result of the sample company, UB Group. That means Radico khaitan has shown the poor operating performance in the post LBO as compared to that of pre LBO period as its mean (11.95) and median (10.97) pre-interest ROS has decreased in post LBO period. Coefficient of variation (CV) of the sample company, UB Group has decreased in the post LBO as compared to that of pre LBO period which is also good indicator of improvement in operating performance of the company. Whereas CV of the control company, Radico khaitan has increased twice in post LBO period in contrast to that of pre LBO period which indicates poor operating performance of the firm.

6.1.3 Pre-interest ROS of Tata Steel and JSW Steel

It is noticed from Table 1 that mean (39.90) and median (40.68) pre-interest ROS of Tata Steel has increased remarkably in post LBO period in contrast to that of pre LBO period which indicate post LBO improvement in operating performance of Tata Steel after LBO. JSW Steel, the control company has shown the opposite result of the sample company, Tata Steel. That means JSW Steel has shown the poor operating performance in the post LBO as compared to that of pre LBO period as its mean and median pre-interest ROS has decreased in post LBO period. From Coefficient of variation (CV) point of view, the sample company, Tata Steel has decreased in the post LBO as compared to that of pre LBO period which is also good indicator of improvement in operating performance of the company. Whereas CV of the control company, JSW Steel has increased remarkably in post LBO period in contrast to that of pre LBO period which indicates poor operating performance of the firm.

6.1.4 United Spirits and Radico Khaitan

From Table 1 it is seen that there is improvement in operating performance of United Spirits as a result of LBO as its mean (18.4) and median (18.11) pre-interest ROS has increased two times in post LBO period in contrast to that of pre LBO period. Radico Khaitan, the control company has shown the opposite result of the sample company, United spirits. That means Radico Khaitan has shown the poor operating performance in the post LBO as compared to that of pre LBO period as its mean and median pre-interest ROS has decreased in post LBO period. Coefficient of variation (CV) of the sample company, united spirits has decreased remarkably in the post LBO period as compared to that of pre LBO period which is also good indicator of improvement in operating performance of the company as a result of LBO. Whereas CV of the control company, Radico Khaitan has increased remarkably in post LBO period in contrast to that of pre LBO period which indicates poor operating performance of the firm.

6.1.5 Tata motors and Maruti Suzuki

An improvement in operating performance has been noticed from Table 1 in case of Tata Motors in the post LBO period as its pre-interest ROS mean and median values have increased in the post LBO period in contrast to that of pre LBO period. CV of the sample company, Tata Motors, has decreased in the post LBO period as compared to that of pre LBO period which is also good indicator of improvement in operating performance of the firm. On the other hand Maruti Suzuki has shown poor operating performance in the post LBO period in contrast to that of pre LBO period as its pre-interest mean value has decreased in the post LBO period. More over coefficient of variation of the control company, Maruti Suzuki has increased in the post LBO period. Therefore it can be said that the control company has performed poorly in the post LBO period.

6.1.6 Dr. Reddy's laboratory and Sun Pharma

The mean and median pre-interest ROS of Dr. Reddy's Laboratory has increased remarkably in the post LBO period as compared to that of pre LBO period which is depicted by Table 1. It indicates improvement in operating performance of the firm after LBO. Coefficient of variation of the firm has decreased rapidly in the post LBO period as compared to that of pre LBO period which is also a good indicator of improvement in operating performance of the company. Sun Pharma, has also shown increase in operating improvement in the post LBO period as compared to pre LBO period as it is disclosed by increased in mean and median pre-interest ROS. But its coefficient of variation in the post LBO period has increased as compared to pre LBO period.

6.1.7 Suzlon Energy and NTPC

From Table 1 it is seen that mean (22.54) and median (22.69) pre-interest ROS of Suzlon Energy has increased in post LBO period in contrast to that of pre LBO period which indicate post LBO improvement in operating performance of the company as a result of LBO. NTPC, the control company has shown the opposite result of the sample company, Suzlon Energy. That means NTPC has shown the poor operating performance in the post LBO as compared to that of pre LBO period as its mean and median pre-interest ROS has decreased in post LBO period. Coefficient of variation (CV) of the sample company, Suzlon Energy has remain same in both pre and post LBO period which is also indicate stability of pre-interest ROS of the company. Whereas CV of the control company, has decreased remarkably in post LBO period in contrast to that of pre LBO period.

6.1.8 United Phosporus and Pidilite Industries

It is observed from Table 1 that there is poor operating performance of the company as a result of LBO as mean and median pre-interest ROS of United Phosporus Limited has decreased in post LBO period in contrast to that of pre LBO period. Pidilite Industry, the control company has also shown the similar result that of the sample company, United phosporus. That means both the companies have shown the poor operating performance in the post LBO as compared to that of pre LBO period as its mean and median pre-interest ROS has decreased in post LBO period. Coefficient of variation (CV) of the sample company as well as control company have increased remarkably in the post LBO as compared to that of pre LBO period which indicate variability in pre-interest ROS in the post LBO period.

6.1.9 Aban Offshore and Reliance Industries

An improvement in operating performance of Anan Offshore has been observed from Table 1 as mean and median pre-interest ROS of Aban Offshore has increased remarkably in post LBO period in contrast to that of pre LBO period. Reliance Industries, the control company has shown the opposite result of the sample company, Aban Offshore because its post LBO median pre-interest on ROS has decreased. That means Reliance Industries has shown the poor operating performance in the post LBO as compared to that of pre LBO period. Coefficient of variation (CV) of the sample company as well as control company, have increased in the post LBO period remarkably as compared to that of pre LBO period which is also a poor indicator of operating performance of the company. However mean pre-interest ROS of the control company, Reliance Industries has increased in post LBO period in contrast to that of pre LBO period which indicates good operating performance of the firm.

6.1.10 Tata Coffee and Tata Global Beverage

It is depicted from Table 1 that mean pre-interest ROS of Tata Coffee has increased in post LBO period in contrast to that of pre LBO period which indicate post LBO improvement in operating performance of the company. Tata Global Beverage, the control company has shown the similar result that of the sample company, Tata Coffee. That means Tata Global Beverage has also shown the improved operating performance in the post LBO as compared to that of pre LBO period as its mean and median pre-interest ROS has increased in post LBO period. However Coefficient of variation (CV) of the sample company, Tata Coffee has decreased in the post LBO period remarkably as compared to that of pre LBO period which is also good indicator of improvement in operating performance of the company as a result of LBO. Whereas CV of the control company, Tata Global Beverage has increased remarkably in post LBO period in contrast to that of pre LBO period.

6.1.11 Nirma Limited and Tamilnadu Petro

It is evident from Table 1 that there is improvement in operating performance of UB Group after LBO as its mean and median pre-interest ROS has increased in post LBO period in contrast to that of pre LBO period. Tamilnadu Petro, the control company has also shown the similar result that of the sample company, Nirma Limited. That means Tamilnadu Petro has shown good operating performance in the post LBO period as compared to that of pre LBO period as its mean and median pre-interest ROS has increased in post LBO period. Coefficient of variation (CV) of the sample company as well as control company, have decreased remarkably in the post LBO as compared to that of pre LBO period which is also a sound indicator of improvement in operating performance of the company.

6.1.i Interpretation of Summary Results of Change in Pre interest ROS

Now we have focused on the summary result of pre-interest ROS of the sample companies as well as their matching control companies in Table 2. It is depicted from Table 4.18 that 81.82% (72.73%) sample companies have disclosed increase in mean(median) pre-interest ROS and remaining 18.18% (27.27%) sample companies has shown decrease in mean (median) pre-interest ROS after LBO. Whereas the opposite results have been observed by the matching control companies. This implies that sample companies have improved its operating performance far better than that of control companies. From the CV of pre-interest ROS point of view, only 3 sample companies have shown decrease in CV on pre-interest ROS out of 11 sample companies. Whereas 9 control companies have disclosed increase in CV of pre-interest ROS out of 11 control companies. This indicates sample companies have more stability in operating performance than control companies in the post LBO period.

For better understanding three figures viz, Figure 1, Figure 2 and Figure 3 have been drawn to represent the summary results of pre interest ROS of all the sample and control companies in order to make a comparison between pre LBO and post LBO period. It is noticed from Figure 1 and Figure 2 that mean and median pre-interest ROS of the sample companies have increased in post LBO period in contrast to that of pre LBO period whereas control companies have exhibited the opposite results of the sample companies. Therefore sample companies have performed far better than that of the matching control companies after LBO. Figure 3 has disclosed that sample companies have more stability in operating performance after LBO than that of matching control companies.

6.1.ii Interpretation of paired sample t test results on Pre-interest ROS of sample companies and control companies

We have conducted paired t test on mean pre-interest ROS of both sample and control companies in order to determine whether the above calculated results are statistically significant or not. If we find significant result for the sample companies and insignificant result for the control companies then it may be concluded that LBO has significant positive impact on operating performance on the sample companies. Paired t test results have been discussed in Table 3.It is observed from the Table 4.19 that t value on mean pre-interest ROS is significant at 5% level for sample companies between pre LBO and post LBO period. It indicates that there is statistically significant improvement in operating performance of the sample companies after LBO. On the other hand t value is insignificant for the control companies before and after LBO period which indicates that there is no statistically significant improvement in operating performance of the control companies after LBO.

Now we have discussed the second variable namely, pre-interest ROA for measuring the operating performance of both sample and matching control companies before and after LBO period in Table 4.

6.2 Interpretation of Results on Pre-interest ROA of sample companies and control companies.

6.2.1 Hindalco Industries and National Aluminium.

From Table 4 it is observed that post LBO mean (21.04) and median (22.19) pre-interest ROA of Hindalco industries has increased as compared to that of pre LBO mean (19.64) and median (20.33). The opposite results have been found in case of control company, national Aluminium. It indicates that there is improvement in operating performance of Hindalco Industries but poor performance of National Aluminium as its mean and median value of pre-interest ROA have decreased remarkably in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of the Hindalco Industries and National Aluminium has increased in the post LBO period as compared to that of pre LBO period. Year wise trend of Hindalco industries has shown that there is increase in pre-interest ROA in year (t+1) and (t+2) as compared to year (t-1) which also indicates an improvement in operating performance. In case of National Aluminium, pre-interest ROA has decreased in year (t+1) to (t+3) as compared to year (t-1) which indicates poor operating performance in the post LBO period.

6.2.2 UB Group and Radico Khaitan

From Table 4 it is evident that there is improvement in operating performance as post LBO mean (11.91) and median (11.57) of pre-interest ROA of UB Group has increased in contrast to that of pre LBO mean (11.4) and median (11.28). Whereas opposite result has been noticed in case of control company, Radico Khaitan. It indicates poor performance of Radico Khaitan as its mean and median value of pre-interest ROA have decreased remarkably in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of both UB Group and Radico Khaitan has increased in the post LBO as compared to that of pre LBO period. Year wise trend of UB group has shown that there is increase in pre-interest ROA in year (t+1) to (t+3) as compared to year (t-1) which also indicates an improvement in operating performance in the post LBO period. In case of Radico Khaitan, pre-interest ROA has decreased in year (t+1) to (t+3) as compared to that of year (t-1) which indicates poor operating performance in the post LBO period.

6.2.3 Tata Steel and JSW Steel

An improvement in operating performance is observed from Table 4 because post LBO mean (53.38) and median (54.18) of pre-interest ROA of Tata Steel has increased in contrast to that of pre LBO mean (52.53) and median (48.58). Whereas opposite results have been found in case of control company, JSW Steel. It indicates that there is poor performance of JSW Steel as its mean and median value of pre-interest ROA have decreased remarkably in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of the Tata Steel has decreased remarkably in the post LBO period in contrast to that of pre LBO period which also indicates an improvement in operating performance after LBO. But JSW Steel has shown that there is increased in CV in the post LBO period as compared to that of pre LBO period which indicate poor operating performance in the post LBO period. Year wise trend of Tata Steel has shown that there is increased in pre-interest ROA in the year (t+1) to (t+3) as compared to year (t-1) which means that there is improvement in operating performance after LBO. But year wise trend of control company, JSW Steel has shown that there is remarkably decreased in pre-interest ROA in the year (t+2) and (t+3) as compared to that of year (t-1) which indicates poor operating improvement after LBO of the control company.

6.2.4 United Spirits and Radico Khaitan

From Table 4 it is evident that mean (11.91) and median (11.57) pre-interest ROA of UB Group has increased in post LBO period in contrast to that of pre LBO mean (11.4) and median (11.28).The opposite result has been noticed in case of control company, Radico Khaitan. It indicates that there is poor performance of Radico Khaitan as its mean and median value of pre-interest ROA have decreased remarkably in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of both UB Group and Radico Khaitan has increased in the post LBO period as compared to that of pre LBO period. Year wise trend of UB group has shown that there is an improvement in operating performance in the post LBO period as pre-interest ROA has increased in year (t+1) to (t+3) as compared to year (t-1). In case of Radico Khaitan, pre-interest ROA has decreased in year (t+1) to (t+3) as compared to that of year (t-1) which indicates poor operating performance in the post LBO period.

6.2.5 Tata Motors and Maruti Suzuki

The mean (30.86) pre-interest ROA of Tata Motors has decreased in post LBO period in contrast to that of pre LBO mean (36.31) which is depicted by Table 4. It indicates an improvement in operating performance of the company after LBO. Whereas post LBO median (37.92) pre-interest ROA has increased as compared to that of pre LBO median (36.55) pre-interest ROA of the sample company. Mean and median pre-interest ROA of Maruti Suzuki has decreased in post LBO period in contrast to that of pre LBO period which also indicates poor performance in the post LBO period. Coefficient of Variation (CV) of both Tata Motors and Maruti Suzuki has increased remarkably in the post LBO period in contrast to that of pre LBO period which also indicates high variability in operating performance after LBO. But year wise trend of pre-interest ROA of Tata Motors has shown that there is increased in the year (t+1) and (t+2) as compared to that of year (t-1) which indicate improvement in operating performance in the post LBO period. Whereas Year wise trend of Maruti Suzuki has shown that there is poor operating performance after LBO of the control company as its pre-interest ROA has decreased in the year (t+1) to (t+3) as compared to year (t-1).

6.2.6 Dr. Reddy's Laboratory and Sun Pharma

From Table 4 it is evident that post LBO mean (23.86) pre-interest ROA of Dr.Reddy's laboratory has increased as compared to that of pre LBO mean (16.39) . Whereas opposite result has been noticed in case of control company, Sun Pharma. It indicates that there is improvement in operating performance of Dr. Reddy's laboratory but poor performance of Sun Pharma as its mean and median value of pre-interest ROA have decreased remarkably in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of both Dr. Reddy's Laboratory and Sun Pharma has decreased in the post LBO period as compared to that of pre LBO period which is also a good indicator of improvement in operating performance. Year wise trend of Dr. Reddy's Laboratory has shown that there is increase in pre-interest ROA in year (t+1) to (t+3) as compared to year (t-1) which indicates an improvement in operating performance in the post LBO period. In case of Sun Pharma, pre-interest ROA has decreased in year (t+1) as compared to that of year (t-1) which indicates poor operating performance after one year of LBO.

6.2.7 Suzlon Energy and NTPC

It is observed from Table 4 that there is enhancement in operating performance of the company after LBO as post LBO mean (42.19) pre-interest ROA of Suzlon Energy has increased in post LBO period in contrast to that of pre LBO mean (37.72). Whereas opposite results have been noticed in case of control company, NTPC which indicates that there is poor operating performance after LBO as its mean value has decreased mildly. Coefficient of Variation (CV) of the Suzlon Energy has increased in the post LBO period in contrast to that of pre LBO period which also indicates less stability in operating performance after LBO. But NTPC has shown that there is decreased in CV in the post LBO period as compared to that of pre LBO period which indicate more stability of operating performance in the post LBO period than that of pre LBO period. Year wise trend of Suzlon Energy has shown that there is improvement in operating performance after one year of LBO as pre-interest ROA in the year (t+1) has increased as compared to that of year (t-1). But year wise trend of control company, NTPC has shown that there is increased in pre-interest ROA in the year (t+1) and (t+2) as compared to that of year (t-1) which also indicate improve operating performance after LBO.

6.2.8 United Phosporus and Pidilite Industry

From Table 4 it is observed that post LBO mean (18.64) pre-interest ROA of United Phosporus has decreased as compared to that of pre LBO mean (20.04) which indicate poor performance after LBO even though median value has increased in post LBO period as compared to that of pre LBO period. Similar results have been noticed in case of control company, Pidilite Industries. Therefore no conclusion can be drawn after comparing both the companies. So far as the Coefficient of Variation (CV) is concerned, it is observed that there is remarkably decreased in CV pre-interest ROA of United Phosporus in the post LBO period in contrast to that of pre LBO period which indicates an improvement in operating performance after LBO. But Pidilite Industries has shown that there is increased in CV pre-interest ROA in the post LBO period as compared to that of pre LBO period which indicate poor operating performance in the post LBO period. Year wise trend of United Phosporus has shown that there is increased in pre-interest ROA in the year (t+1) to (t+3) as compared to year (t-1) which also indicate improvement in operating performance after LBO. Year wise trend of control company, Pidilite Industries has shown the similar trend like United Phosporus.

6.2.9 Aban Offshore and Reliance Industries

An improvement in operating performance after LBO is evident from Table 4 because post LBO mean (23.87) pre-interest ROA of Aban Offshore has increased as compared to that of pre LBO mean (22.23). Even though median value has decreased in post LBO period. Whereas similar results has been found in case of control company, Reliance Industries. Coefficient of Variation (CV) of Aban Offshore has decreased in the post LBO period in contrast to that of pre LBO period which also indicates an improvement in operating performance after LBO. But Reliance Industries has shown that there is increased in CV in the post LBO period as compared to that of pre LBO period which indicate poor operating performance in the post LBO period. Year wise trend of Aban Offshore has shown that there is decreased in pre-interest ROA in the year (t+1) and (t+2) as compared to year (t-1) which means immediate poor operating performance after LBO. But year wise trend of control company, Reliance industries has shown that there is increased in pre-interest ROA in the year (t+1) and (t+2) as compared to that of year (t-1) which indicates improvement in operating performance after LBO.

6.2.10 Tata Coffee and Tata Global Beverage

From Table 4 it is seen that mean (14.07) and median (14.16) pre-interest ROA of Tata Coffee has increased in post LBO period in contrast to that of pre LBO mean (12.73) and median (13.16) which indicate improve operating performance after LBO. Whereas control company, Tata Global Beverage has shown increase in mean pre-interest ROA in the post LBO period. It indicates that there is improvement in operating performance of the control company. But median value of the company has decreased in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of the Tata Coffee has decreased remarkably in the post LBO period in contrast to that of pre LBO period which also indicates an improvement in operating performance after LBO. But Tata Global Beverage has shown that there is increased in CV in the post LBO period as compared to that of pre LBO period which indicate poor operating performance in the post LBO period. Year wise trend of Tata Coffee has shown that there is improvement in operating performance after LBO as pre-interest ROA has increased in the year (t+1) to (t+3) as compared to year (t-1). But year wise trend of control company, Tata Global Beverage has shown that there is remarkably decreased in pre-interest ROA in the year (t+2) and (t+3) as compared to that of year (t-1) which indicates poor operating improvement after LBO.

6.2.11 Nirma Limited and Tamilnadu Petro

A remarkably improvement in operating performance is observed from Table 4 as post LBO mean (15.94) and median (18.49) pre-interest ROA of Nirma Limited has increased as compared to that of pre LBO mean (8.08) and median (7.05). Whereas similar result has been found in case of control company, Tamilnadu petro. It indicates that there is improvement in operating performance of both the companies as its mean and median value of pre-interest ROA have increased remarkably in the post LBO period in contrast to that of pre LBO period. Coefficient of Variation (CV) of the Nirma Limited has increased in the post LBO period in contrast to that of pre LBO period which also indicates high variability in pre-interest ROA after LBO. But Tamilnadu Petro has shown that there is increased in CV in the post LBO period as compared to that of pre LBO period which indicate more stability in pre-interest ROA in the post LBO period. Year wise trend of both the companies have shown excellent improvement in operating performance after LBO period.

6.2.i Interpretation of Summary Results of Change in Pre interest ROA of sample and control companies.

Now we have disclosed the summary results of pre-interest ROA of sample companies and their matching control companies in Table 5.It is depicted from Table 5 that 81.82% sample companies have exhibited increase in mean pre-interest ROA. That means approximately 9 (82%) sample companies have shown improvement in operating performance out of 11 sample companies and remaining 2(18%) sample companies have disclosed poor operating performance in the post LBO period. Whereas only 3 (27.27%) control companies have shown increase in mean pre-interest ROA in the post LBO period out of 11 control companies and remaining 8(72.73%) control companies have shown poor operating performance after LBO period. Therefore post LBO performance of sample companies is far better than that of control companies.

For better understanding of the summary results of pre interest ROA of all the sample and control companies, we have prepared pie charts [Figure 4, Figure 5 and Figure 6] in order to make a comparison between pre LBO and post LBO period of the sample company and its matching control companies. It is noticed from Figure 4 and Figure 5 that mean and median pre-interest ROS of the sample companies have increased in post LBO period in contrast to that of pre LBO period whereas control companies have exhibited the opposite results of the sample companies. Therefore sample companies have performed far better than that of the matching control companies after LBO. Figure 6 has disclosed that sample companies have more stability in operating performance after LBO than that of matching control companies.

6.2.ii Interpretation of paired t test results on Pre interest ROA of sample and control companies.

Now we have conducted paired t test on mean pre-interest ROA of both sample and control companies in order to check whether the above calculated results are statistically significant or not. If we find significant result for sample companies and insignificant result for control companies then it may be concluded that LBO has significant positive impact on operating performance on the sample companies. Paired t test results have been discussed in Table 5.It is observed from the Table 6 that t value of sample companies is significant at 10% level between pre-LBO and post LBO period. It indicates that there is statistically significant improvement in operating performance of the sample companies after LBO. On the other hand t value is insignificant for the control companies before and after LBO period which indicates that there is no statistically significant improvement in operating performance of the control companies between pre LBO and post LBO period.

7. Conclusion and scope for future research

This study examines the evolution of firms' operating performance after leveraged buyout for a sample of eleven LBOs taking place between 2005-06 to 2015-16. Our empirical findings shed light on the motives for LBOs and their performance in Indian scenario. We find (1) Pre-interest ROS of the sample companies has increased on an average compared to matching control companies after LBO period and (2) Pre-interest ROA of the sample companies has also increased as compared to that of matching control companies following LBO. On the basis of computed results, it is concluded that LBO leads to improvement in operating performance. Moreover computed results on pre-interest ROS and pre-interest ROA have shown statistically significant improvement in operating performance in case of sample companies in the post LBO whereas opposite results have been found in case of control companies. Similarly capital structure, growth and dividend policy of the selected companies after LBO can be measured which may be taken as future research area.

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