An empirical study to analyze the of homogeneity of variance in operating performance after the merger: with special reference to the manufacturing sector

Dr S Nirmala, Research Supervisor and Associate Professor, Department of Business Administration, Principal, PSGR Krishnammal College for Women
Arsha Shaju, PhD Scholar, Department of Business Administration, PSGR Krishnammal College for Women,

Abstart

Mergers and acquisition homogeneity of variance is studied in the present study. 12 firms operating in manufacturing sector is taken from automotive, electronics, drugs and pharmaceuticals. Only post-merger period is considered. Anova is applied. Result showed that there is no homogeneity of variance in ratios between the firms operating in manufacturing sectors.

Key words: post-merger, anova, homogeneity of variance

Introduction

Mergers are when firms combine together to form a new firm where as acquisition is when a firm is purchased by other firm (Ferhan Aytac and can tansel kaya, 2016). Merger and acquisition wave started in USA during 1892 to 1902 but the reason is external environment that is during the period the development in infrastructure forced the competitors to merge (Capron). second wave mostly "vertical integration" that is a (buyer merging or acquiring a seller) were taking place (Lipton, 2006, p 4). During third wave mostly conglomerate merger took place (Bernard s black, 2000). During fourth wave hostile takeovers were high in number (Ferhan Aytac and can tansel kaya, 2016), fifth wave is also called "international mergers and acquisitions" (Patrick A. Gaughan, p . 66)

Literature review

Harpreet Singh Bedi (2010) examined whether there is any difference in the trend of mergers and acquisitions in service and manufacturing sector during different time period in India. T test and Anova is employed. Result revealed that between varies years there is no big difference in the deal number however there is a difference between the deal happening in the manufacturing and service sectors.

K Jayakumar (2003) analysed the impact of mergers and acquisitions on the operating performance of pharmaceutical industry in India. Ratio analysis and t test is employed for a period of 6 years. Result indicated that the performance of pharmaceutical firm is not that adequate in the post-merger period.

Objective1: To know whether liquidity of firms have homogeneity of variance between the different industries operating in the manufacturing sector

Objective 2: To know whether profitability of firms have homogeneity of variance between the different industries operating in the manufacturing sector

- ✓ Current ratio is used to measure the liquidity of the firm
- ✓ Profitability of the firm is measured using the return on net worth and the operating profit margin

Hypothesis

Null hypothesis: homogeneity of variance of liquidity ratio is not significantly different for the firms operating in different industries of manufacturing sector

Null hypothesis: homogeneity of variance of profitability ratio is not significantly different for the firms operating in different industries of manufacturing sector

Methodology

Descriptive research is done, sampling method used is purposive sampling. Only firms from manufacturing industry is taken. In manufacturing sector for the present study three different industry is chosen.

Secondary data including ratios are collected from Prowess IQ, Money control and India info line.

Ratios taken

- ✓ S vanitha and M Selvam (2011) used current ratio and operating profit ratio
- ✓ K Jayakumar (2003) Return on net worth

Table 1

Industry	Merger/Acquirer	Year	Deal type
Automotive	Sundaram Fasteners	2003	Acquisition
	Bharat Forge	2003	Acquisition
	Amtek Auto	2003	Acquisition
Electronics	Crompton Greaves	2000	Acquisition
	Tata Power Ltd	2000	Acquisition
	Everready Industries Ind Ltd	2000	Acquisition
Drugs and Pharmaceuticals	Dr Reddy's Lab	2003	Acquisition
	Piramal Health	2002	Acquisition
	Suvan Life Science	2003	Acquisition

Table 1 shows the sample statistics in the present study. Three industries that is automotive, electronics and drugs and pharmaceuticals were selected. Only those firms merged or acquired during 2000 to 2003 were selected for the study to understand whether the merger is the result of industry shocks.

Table 2

Post-Acquisition of Acquirers Average (Avg) Ratios

(OPM = Operating profit margin, RONW = Return on Net Worth)

Automotive			
Ratios	Sundaram Fasteners	Bharat forge Ltd	Amtek Auto
Average of OPM	13.37	25.31	27.60
Average of RONW	17.51	19.71	8.35
Avg Current Ratio	0.81	1.26	2.62
Electronics			
Ratios	Crompton Greaves	Tata Power Ltd	Everready Industries
Average of OPM	10.46	22.41	7.56
Average of RONW	20.49	10.48	-1.10
Avg Current Ratio	1.09	1.65	0.66
Chemical Industries			
Ratios	DrReddy's Lab	Piramal Health	Suvan Life Science
Average of OPM	22.51	0.97	18.41
Average of RONW	14.10	24.65	13.80
Avg Current Ratio	1.90	1.97	11.26

Table 2 : Shows the average value of ratios for 12 years after the merger and acquisition. By seeing the table it would be difficult to interpret whether there variance is similar within the industries. So leven's test is employed.

Table 3

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Operating Profit Margin	.013	2	6	.987
Return on Net Worth	.378	2	6	.700
Current Ratio	1.905	2	6	.229

Table 3 shows leven's test which shows for operating profit margin, Return on Net worth and current ratio whether there is a homogeneity of variance among different industries that is automotive, electronics and chemical industries.

For operating profit margin the calculated p value (.987) of leven's test is greater than 0.05. So here the null hypothesis of equal variance is not rejected. Findings clearly shows that homogeneity of variance is same for operating profit margin among the different industries.

For return on net worth the leven's test p value is .700 which is greater than the significant value of 0.05. Here the null hypothesis of equal variance is not rejected. Result shows that there is a homogeneity of variance of return on net worth in between the different industries that is automotive, electronics and chemical industry.

For current ratio the resulting p value of leven's test is .229. Since p value of leven's test is greater than the accepted significance level of 0.05 so the null hypothesis's not rejected. Test clearly shows that the homogeneity of difference is similar for current ratio with in the different industries in the manufacturing sector.

Table 4

ANOVA

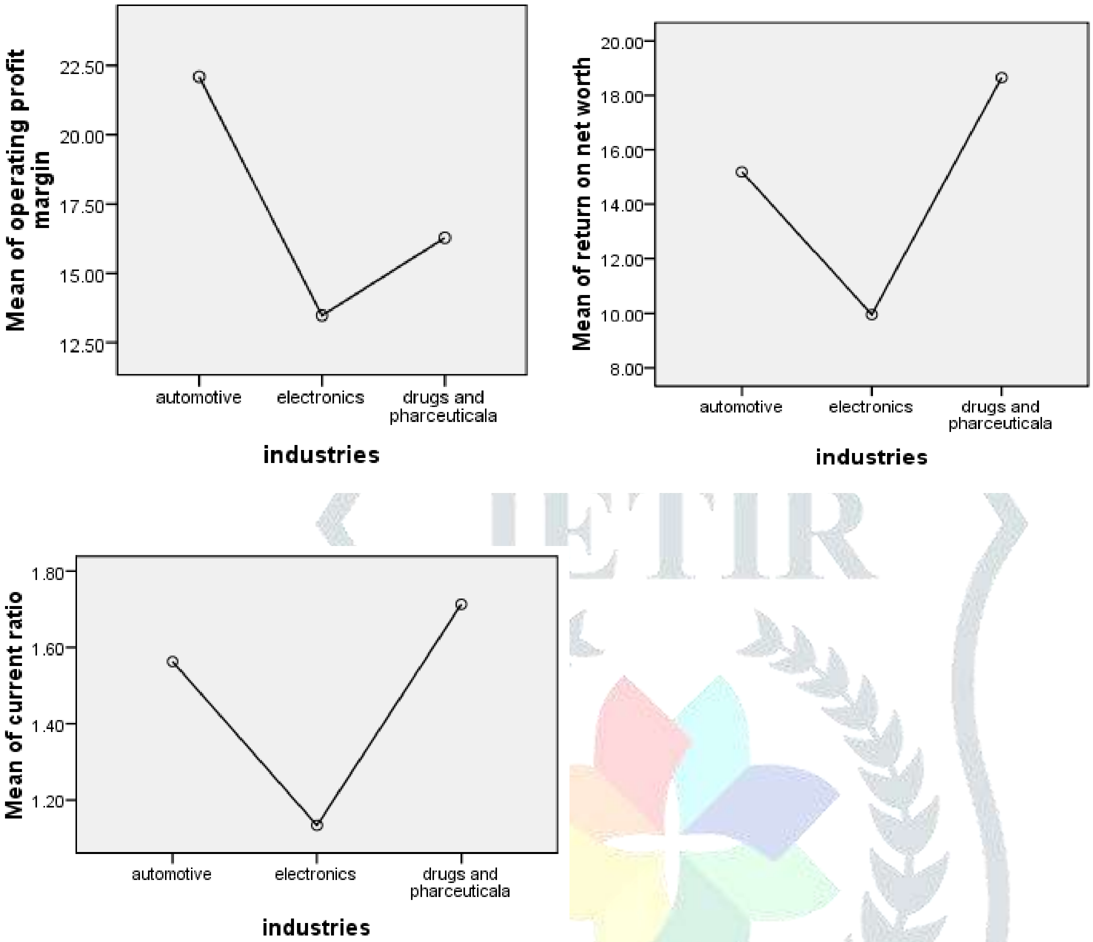
		Sum of Squares	df	Mean Square	F	Sig.
operating profit margin	Between Groups	115.900	2	57.950	.982	.427
	Within Groups	353.918	6	58.986		
	Total	469.818	8			
return on net worth	Between Groups	114.852	2	57.426	.786	.498
	Within Groups	438.470	6	73.078		
	Total	553.323	8			
current ratio	Between Groups	.544	2	.272	.632	.563
	Within Groups	2.580	6	.430		
	Total	3.124	8			

Table 4: indicate that operating profit margin is not having statistically significant difference among various industries.

Return on net worth is not having statistically significant difference among different industries that is automotive, electronics and chemical industry

Current ratio is not having statistically significant difference with in the industries operating in the manufacturing sectors.

Graph 1



Graph 1 shows the statistical difference between the mean plot of the automotive, electronics and the drugs and pharmaceuticals

Conclusion

Present study shows that Indian manufacturing sectors have no variance of homogeneity among different industries liquidity and profitability ratios in the post-merger and acquisition period. So the study in a particular industry during the period could be extended to other industries also operating in the manufacturing sector. Future scholars could do the study to identify whether there is a homogeneity of variance for the operating performance in the post-merger period among the firms operating in manufacturing and the service sectors.

Reference:

- Bernard S. Black,The First International Merger Wave (and the Fifth and Last U.S. Wave), 54 U. Miami L. Rev. 799 (2000) Available at: http://repository.law.miami.edu/umlr/vol54/iss4/6
- Ferhan Aytac and can tansel kaya (2016) "Contemporary look on the historical evolution of mergers and acquisitions", international journal of economics, commerce and management" Vol IV, Issue 2, February 2016, ISSN 23480386, http://ijecm.co.uk/, United Kingdom

- Harpreet Singh Bedi (2010) "Mergers and acquisitions in India : An Analytical Study",lovely school of business,Lovely professional university, ssrn.com/abstract=1618272, research gate
- K. Jayakumar (2013) "Impact of Acquisition on Operating Performance in Indian Pharmaceutical Industry", "Indian Journal of Economics and Development", Vol: 1 , Issue: 3 , March 2013 , ISSN 2320-9836
- Klaus Gugler, Dennis C Mueller, and B.Burcin Yurtoglu "the determinants of merger waves" university of Vienna,department of economics, BWZ, Bruennerstr. 72, A-1210 Vienna, Austria
- Laurence Capron "Historical Analysis of three waves of mergers and acquisition in the united states (1887-1904, 1916-1929,1950-1970): Triggering factors, motivation and performance" University of western Ontario, Richarf ivy business school, London, Ontario, Canada, N6A 3K7
- Martin Lipton (2006) "Merger waves in the 19th, 20th and 21st centuries" The Davies Lecture, Osgoode Hall Law School, York University, September 14, 2006 pp 1-22
- S. Vanitha and M.Selvam "financial performance of Indian Manufacturing Companies during pre and post-merger", Journal of financial market research", ISSN 1986-4310 Issue 2 (2011), EuroJournals Publishing, Inc. 2011, http://www.journaloffinancialmarketsresearch.com
- Vidhya V (2009-2012) Doctoral Published Thesis "A study on the performance of the selected companies before and after the merger and acquisitions", doctor of philosophy in economics, submitted to bharathiar university, psg college of arts and science, Inflibnet
- Patrick A. Gaughan "mergers, acquistions, and corporate restructurings" fifth edition, wiler india pvt ltd, ISBN 978-81-265-3166-0
- CMIE prowess IQ
- http://shodhganga.inflibnet.ac.in/
- www.moneycontrol.com
- India infoline