CHAPTER - 3

RESEARCH METHODOLOGY

CHAPTER 3- RESEARCH METHODOLOGY

This part of the chapter consists of procedures followed for carrying out study. It includes conceptual clarification of terms used, objectives of study, data collection, period of study, sample selection, tools and techniques used in study.

3.1 STATEMENT OF PROBLEM

"Impact of Mergers and Acquisitions on financial performance –A study of selected pharmaceutical companies in India"

3.2 CONCEPTUAL CLARIFICATION

- The term Mergers' refer to a situation where two or more companies combine in to one company. It is defined as 'Transaction involving two or more companies in the exchange of securities and only one company survives'. (Mukherjee & Hanif, 2003)
- Acquisition is defined as "a purchase of a company or a part of it so that the acquired company is completely absorbed by acquiring company and thereby no longer exists as a business entity" (Mukherjee & Hanif, 2003)
- Financial Performance refers to firm's ability to generate revenue over a given period of time as compared to average performance of selected Pharmaceutical companies.
- Pharmaceutical companies refer to the companies that discover, develop, produce, and markets drugs for use as medications. Those Pharmaceutical companies which have undertaken Mergers and Acquisitions (Acquirer companies) between the year 2005-06 to 2010-11 is selected for the purpose of study.

3.3. OBJECTIVE OF THE STUDY

Overall Objective:

To examine the impact of Merger and Acquisitions on financial performance of selected sample pharmaceutical companies

Specific Objectives

1. To evaluate the profitability of each of the selected sample company during the pre and post-Merger and Acquisition period.

2. To assess the Liquidity of each of the selected sample company during the pre and post-Merger and Acquisition period.
3. To examine long term financial strength of each of the selected sample company during the pre and post-Merger and Acquisition period.
4. To analyze financial health of the selected sample company during the pre and post-Merger and Acquisition period.
5. To analyze and evaluate the combined profitability, liquidity and long term financial strength of all the selected sample companies during the pre and post-Merger and Acquisition period.

3.4 RESEARCH METHODOLOGY

3.4.1 Data Collection

The study is based on secondary data collected from annual reports of the company and the required data has been extracted from various websites, books, journals, Prowess [Industrial database package] official websites of company, published and unpublished thesis and newspapers

3.4.2 Period of study

The period of 16 years commencing from 2000-2001 and ending on 2015-2016 is selected for the purpose of the study. The year in which Merger and Acquisition is completed is considered as Zero year. Years prior to merger and acquisition are considered as premerger deal years; and years after merger and acquisition are taken as post-merger deal years while doing the study on individual acquirer company.

For Getting the comprehensive view averages of all selected companies are combined and compared in Pre-Merger and Post-Merger period.

The Period of study is from 2000-2001 to 2015-2016 which is 16 years in total. Sample selection of Mergers and Acquisition cases done between period of 2005-2006 to 2010- 2011 Hence period from 2000-2001 to 2004-2005 is considered as premerger period and period from 2011-2012 to 2015-2016 is considered as Post-merger period which has been compared by applying Paired T test. Period from 2005-2006 to 2010- 2011 which is sample selection period also called as During the Merger Period has been analyzed too. In order to study the differences in averages between and within the groups i.e. Pre merger period, During the merger period and Post-merger period, one way annova has been applied on all average ratios of selected sample companies

3.4.3 Sample Selection

Purposive sampling technique, one of the Non probability sampling technique has been used for selection of sample, as the objective of the study is to measure the impact of merger or acquisition on the financial performance.

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Sample selection is done in 3 phases as given below

First Phase

For the purpose of conducting an in depth study of impact of Mergers and acquisition on the financial performance of the acquirer pharmaceutical companies, those Mergers and Acquisitions which took place during the period 2005-2006 to 2010-2011are only are considered.

As per the information available from "Prowess- Industrial database package", it was found that 51 cases of Mergers and Acquisitions in the pharmaceutical industry took place during 2005-2006 to 2010-2011 [6 years]. A span of 6 Years as stated above is selected so as to determine minimum of 5 years in Pre and Post- Merger period respectively.

Out of 51 cases, 31 cases of Mergers and Acquisitions in the industry were eliminated due to following:

- 23 cases of Mergers and Acquisitions were such, where more than 1 Merger took place during the period of 2005-2006 to 2010-2011 [i.e. the acquiring company acquired more than 1 companies] and thus were eliminated. It would be difficult to conduct a study as it may lead to overlapping effects on the financial performance of the acquirer firm.
- 3 cases of Mergers and Acquisitions were such which had initiated Merger plan during 2005-2006 to 2010-2011, but were not accomplished.
- 4 cases were such where the acquirer company became the controller of the Targeted company
- 3 cases of Mergers and Acquisitions were such, where the Acquirer companies went into liquidation and are no more into existence.
- 6 Cases of Mergers and Acquisitions were such where 1 acquirer company was unlisted, 1 acquirer company dealt with more than one sector including pharmaceutical sector, data of 1 acquirer company was not available, 1 acquirer company's post period was less than 5 years since

the merger completed in 2011-2012 and 2 acquirer companies were dropped as merger took place with companies other than pharmaceutical companies.

After eliminating 39 cases in phase 1 which resulted in to 12 cases and thus 12 acquirer companies were left for selection.

Second Phase

From the remaining 12 cases of Mergers and Acquisitions,4 cases were eliminated due to fact that the acquirer companies carried out Mergers in 5 years' period immediately preceding the Merger Year. This was done to avoid overlapping effects

Third Phase

In this phase, 1 more case were eliminated due to fact that the acquirer company carried out Mergers in 5 years' period immediately succeeding the Merger Year to avoid overlapping effects.

- Finally, 7 cases / sample acquirer companies which carried out Merger and Acquisition during the period 2005-2006 to 2010-2011 in Pharmaceutical sector are selected as sample size for the purpose of the study.
- The sample acquirer companies selected for purpose of study are as follows**:**

  [1] Dr Reddy's Laboratories Ltd

  [2] Hikal Ltd

  [3] J. B. Chemicals & Pharmaceuticals Ltd.

  [4] Kerela Ayurveda Ltd

  [5] Lupin Ltd

  [6] Makers Laboratories Ltd

  [7] Strides Shashun Ltd [Now strides Pharma Science Ltd]

All the sample companies are listed on National Stock Exchange/Bombay Stock Exchange or both.

3.4.4 Research Hypotheses

To test the objectives mentioned above, the following hypotheses were formulated:

1. **H0:** Merger & Acquisition has no impact on the Gross profit ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Gross profit ratio of the acquiring firm.

2. **H0:** Merger & Acquisition has no impact on the Net profit ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Net profit ratio of the acquiring firm.

3. **H0:** Merger & Acquisition has no impact on the Operating ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Operating ratio of the acquiring firm.

4. **H0:** Merger & Acquisition has no impact on the Cash Profit Margin ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Cash Profit Margin ratio of the acquiring firm.

5. **H0:** Merger & Acquisition has no impact on the Return on Capital Employed ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Return on Capital Employed ratio of the acquiring firm.

6. **H0:** Merger & Acquisition has no impact on the Return on Total Assets ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Return on Total Assets ratio of the acquiring firm.

7. **H0:** Merger & Acquisition has no impact on the Return on Equity ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Return on Equity ratio of the acquiring firm.

8. **H0:** Merger & Acquisition has no impact on the Earnings Per Share ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Earnings Per Share ratio of the acquiring firm.

9. **H0:** Merger & Acquisition has no impact on the Equity Dividend Coverage ratio of the acquiring firm.

   H1: Merger & Acquisition has impact on the Equity Dividend Coverage ratio of the acquiring firm

10. **H0:** Merger & Acquisition has no impact on the Price Earnings ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Price Earnings ratio of the acquiring firm

11. **H0:** Merger & Acquisition has no impact on the Dividend Yield ratio of the acquiring firm.

H1: Merger & Acquisition has impact on the Dividend Yield ratio of the acquiring firm

12. **H0:** Merger & Acquisition has no impact on the Current ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Current ratio of the acquiring firm.

13. **H0:** Merger & Acquisition has no impact on the Quick ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Quick ratio of the acquiring firm.

14. **H0:** Merger & Acquisition has no impact on the Super Quick ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Super Quick ratio of the acquiring firm.

15. **H0:** Merger & Acquisition has no impact on the Debt Equity ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Debt Equity ratio of the acquiring firm.

16. **H0:** Merger & Acquisition has no impact on the Fixed Asset ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Fixed Asset ratio of the acquiring firm.

17. **H0:** Merger & Acquisition has no impact on the Proprietary ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Proprietary ratio of the acquiring firm.

18. **H0:** Merger & Acquisition has no impact on the Capital Turnover ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Capital Turnover ratio of the acquiring firm.

19. **H0:** Merger & Acquisition has no impact on the Inventory Turnover ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the inventory Turnover ratio of the acquiring firm.

20. **H0:** Merger & Acquisition has no impact on the Inventory to Current Asset ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Inventory to Current Asset ratio of the acquiring firm.

21. **H0:** Merger & Acquisition has no impact on the Working Capital Turnover ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Working Capital Turnover ratio of the acquiring firm

22. **H0:** Merger & Acquisition has no impact on the Fixed Asset Turnover ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Fixed Asset Turnover ratio of the acquiring firm

23. **H0:** Merger & Acquisition has no impact on the Interest Coverage ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Interest Coverage ratio of the acquiring firm

24. **H0:** Merger & Acquisition has no impact on the Debtors Turnover ratio of the acquiring firm.

    H1: Merger & Acquisition has impact on the Debtors Turnover ratio of the acquiring firm

25. **$H_1$0:** Merger & Acquisition has no impact on the Composite Index score based on Profitability of the acquiring firm.

    $H_1$1: Merger & Acquisition has impact on the Composite Index score based on Profitability of the acquiring firm.

26. **$H_1$0:** Merger & Acquisition has no impact on the Composite Index score based on Liquidity of the acquiring firm.

    $H_1$1: Merger & Acquisition has impact on the Composite Index score based on Liquidity of the acquiring firm.

27. **$H_1$0:** Merger & Acquisition has no impact on the Composite Index score based on Long term solvency of the acquiring firm.

    $H_1$1: Merger & Acquisition has impact on the Composite Index score based on Long term solvency of the acquiring firm.

28. **$H_1$0:** Merger & Acquisition has no impact on the EVA of the acquiring firm.

    $H_1$1: Merger & Acquisition has impact on the EVA of the acquiring firm.

29. **$H_1$0:** Merger & Acquisition has no impact on the MVA of the acquiring firm.

    $H_1$1: Merger & Acquisition has impact on the MVA of the acquiring firm.

30. **Regression model tested for Pre and Post-Merger & Acquisition period**

    H0: Model is not significant

    H1: Model is significant

3.4.5 Tools and Techniques of Analysis

[A] Study has been conducted on seven selected Acquirer pharmaceutical companies as discussed in the research methodology section. Financial performance of each single company is examined during Pre-Merger and Post-Merger Period separately. Following tools and techniques of analysis are applied

[1] Ratio Analysis

Profitability, Liquidity, Long term solvency and Efficiency of each sample company is measured with the help of different ratios viz Gross profit ratio, Net Profit ratio, Operating Ratio, Cash Profit Margin, Return on capital Employed, Return on Total assets, Return on Equity, Earnings per share, Equity Dividend Coverage ratio, Price Earnings ratio, Dividend Yield ratio, Current ratio, Quick ratio, Super Quick ratio, Debt Equity Ratio, Fixed asset Ratio, Proprietary Ratio, Interest Coverage ratio, Capital Turnover Ratio, Inventory Turnover ratio, Inventory to Current Asset ratio, Working Capital Turnover ratio, Fixed asset Turnover ratio and Debtors Turnover ratio.

Hypothesis framed are tested using one sample" T "test for all the individual sample companies.

Ratios used to analyze data are as follows:

[A]Profitability ratios

[1] **Gross profit Ratio [GPR]**

Gross Profit ratio reflects Gross Profit margin over sales. It gives idea of overall operating performance of a company. The operating performance of a company is an important indicator for understanding overall efficiency of business operations. The Higher the ratio, the greater the efficiency and vice versa. It is calculated as follows: **Gross profit ratio=Gross Profit/Net sales *100**

[2] Net profit ratio [NPR]

Net Profit ratio indicates net profit margin in relation to sales. It reveals the comprehensive efficiency of the business. Any business organization should have sufficient margin to provide appropriate return to the shareholders. The Higher the ratio the greater the efficiency and vice versa. The ratio is calculated as follows: ***Net Profit Ratio =Net Profit /Sales x 100***

[3] Operating ratio [OR]

This is one of the important parameter of efficiency which helps to determine operating efficiency of the business. It shows percentage of cost of goods sold and operating expenses over net sales. Higher ratio indicates inefficiency of an organization and vice versa. The ratio is calculated as follows: **Operating ratio= COGS+ Operating expenses/ sales *100**

[4] Cash profit margin- [CPM]

It represents cash profit margin over sales. It is the better indicator of the performance. The Higher the ratio the greater the efficiency and vice versa. The ratio is calculated as follows: **Cash profit margin=Cash profit/sales*100, {Where cash profit =Net Profit + Depreciation}**

[5] Return on capital employed [ROCE]

Return on Capital Employed shows how efficiently management has utilized the long term funds provided. The Higher the ratio the greater efficiency and vice versa. It is calculated as follows- **PBIT/Capital employed *100**

[6] Return on Total Assets [ROTA]

Return on Total Assets depicts how profitably the financial resources are invested in business enterprise. High the ratio indicates higher efficiency and vice versa. The ratio is calculated as follows: **PBIT/Total Assets [Excluding investment] *100**

[7] Return on Equity [ROE]

Return on Equity indicates the yield of shareholder's fund. It shows the link between net profit and shareholders fund. It is a parameter to measure earnings from the owners' point of view. Higher return on equity shows efficiency of production, sales, financial and general management. However, lower ratio indicates the reverse situation. It is calculated as follows: **PAT/Shareholders Equity *100**

[8] Earnings per share [EPS]

It is significant measure revealing profitability from viewpoint of ordinary shareholders. It shows amount of profit available to equity shareholders per share basis. Higher Earnings per share indicates higher efficiency and better prospects of firm and vice versa. It is calculated as follows: **Profit after tax and preference dividend / No. of equity shares**

[9] Equity Dividend coverage ratio [EDCR]

The ratio reveals how many times equity dividends are covered by profit available for equity shareholders**.** This ratio also discloses amount retained by company considering future requirements. It is calculated as follows: **Net Profit After Tax-Preference div/Equity Dividend**

[10] Price Earnings Ratio [PE ratio]

It indicates market price of an Equity Share to Earnings per Share. It too helps to get value of equity share. The ratio also reveals market's confidence on company's equity. It is calculated as follows: **Current Market price of equity shares/Earning per share**

[11] Dividend Yield Ratio [DY ratio]

The ratio indicates percentage of yield received by an investor on investment in equity shares at current market price of shares. It is calculated as follows: **Dividend per share/Market price *100**

[B] Liquidity Ratios

[12] Current Ratio [CR]

The ratio reveals short term solvency of company indicating company's ability to meet obligations in the form of current liabilities. It is calculated as follows**: CA and short term Loans and advances/CL and short term Provisions**

[13] Quick Ratio [QR]

This ratio measures company's ability to meet current obligations in refined manner, wherein inventories which are many a times take more time in conversion and are not considered in current assets**.** It is calculated as follows**: CA, Current Loans and Advances-Inventories/CL and short term provisions**

[14] Super Quick ratio [SQR]

This ratio is also known as Absolute Liquid ratio and rigorous test of firm's liquidity position. It is known as conservative test of liquidity. Absolute Liquid assets here mean Cash and cash equivalents and short term investments which could be easily convertible in cash. It is calculated as follows**: Absolute liquid assets/Current liabilities**

[**C] Long term solvency ratios**

[15] Debt Equity Ratio [DER]

This ratio represents proportion of long term debt and shareholders fund in total capital structure. It indicates gearing if proportion of debt is low as compared to equity it is known as low geared and vice versa. Constant High Debt Equity is a mark of financial difficulty which a company may face however if it is declining over a time and shows that company is redeeming debt over a period. It is calculated as follows**:Total long term debt/shareholders' funds**

[16] Fixed Asset Ratio [FAR]

The ratio indicates how much long term funds are deployed towards fixed assets. The ratio should be less than 1 as more than 1 indicates that part of fixed assets are financed from short term funds which is not recommended for business. It is calculated as follows**: Fixed assets/Long term funds**

[17] Proprietary Ratio [PR]

It reveals relationship between shareholders' fund and total tangible assets. Larger the proportion of shareholder's fund, stronger the financial position of the company. Reduction in Shareholders fund indicates over dependence on outsiders' fund. It is calculated as follows**: Shareholders fund/Total tangible assets**

[18] Interest coverage Ratio [ICR]

The ratio indicates number of times a company can cover its interest payment from current profits available for the interest payment. A high Interest Coverage Ratio reveals conservative policy of company regarding use of debts or good ability of the company to pay interest charges whereas lower ratio represents either excessive use of debt or inefficient operations of the company. Adequate Interest Coverage Ratio is expected as a sign of good financial health of company. It is calculated as follows: **Profit Before Interest and Tax + Depreciation/Interest**

[D] Efficiency Ratios

[19] Capital Turnover Ratio [CTOR]

Ratio reveals how many times capital employed is rotated in the process of generating sales revenue. The ratio is mark of efficiency for utilisation of capital employed in the form of sales generated. The higher the ratio, greater the efficiency and vice-versa. It is calculated as follows: **Net sales/Capital employed**

[20] Inventory Turnover Ratio [ITOR]

It measures how many times a company's inventory has been sold during the year. It also shows if investment in inventory is fruitful or not and if it is within proper limits or not. High Inventory turnover ratio indicates either increase in sales or sometimes lower investment in inventory whereas low inventory turnover ratio indicates either sales are dropping or more investment has been undertaken in inventory. In general, higher inventory turnover ratio is the mark of efficiency of company in generating sales with given investment in inventory. It is calculated as follows: **Cost of goods sold/Average Inventory**

[21] Inventory to Current asset ratio [ICAR]

The ratio reveals proportion of the current assets held by company in form of inventory by company as a part of current assets. Higher ratio indicates lower absolute liquidity and blockage of funds. It is calculated as follows: **Inventory/Current assets*100**

[22] Working capital turnover ratio [WCTOR]

Ratio reveals extent to which investment in working capital has contributed towards generating sales. The higher the ratio greater the efficiency and vice-versa. It is calculated as follows: **Net sales/Net working capital**

[23] Fixed asset turnover ratio [FATOR]

Ratio reveals extent to which investment in fixed assets has contributed towards generating sales. The higher the ratio greater the efficiency in utilisation of fixed assets and vice-versa. It is calculated as follows: **Net sales/Net fixed assets**

[24] Debtors Turnover Ratio [DTOR]

The ratio indicates how fast money is collected from Debtors. It indicates how efficiently debtors are managed by company. Higher the ratio better is liquidity as well as efficiency of company with respect to management of debtors and vice versa. It is calculated as follows: **Net sales/Average Debtors.** (Kishore, 2017)

[2] Composite Index score

Composite Index score represents overall index for selected parameter. In case of profitability higher the composite index score, better the performance and Vice-Versa. In case of Liquidity and Long term solvency Composite index score represents combine index considering selected ratios. Composite Index score for Pre- Merger and Post- Merger period has been computed for each selected company.

Composite Index score has been built up for Measuring Profitability, Liquidity and Long Term Solvency of each selected company for Pre-Merger and Post-Merger period with selected ratios during the period of study. Composite Index score for Profitability has been built up with Gross profit ratio, Net Profit ratio, Operating Ratio, Cash Profit Margin, Return on Capital Employed, return on Total assets, Return on Equity and Earnings per share. Composite Index score for Liquidity has been computed with Current Ratio Quick ratio, Super Quick ratio, Inventory turnover ratio, Working capital turnover ratio and Debtors Turnover ratio. Composite Index score for Long term solvency is calculated on the basis of Debt Equity Ratio, Fixed asset Ratio and Proprietary Ratio

All ratios for period of study except merger year had been converted on a scale between 0 to 1 so that comparisons could be made on common grounds. All ratios except operating ratio had been converted with following formula-

$$\text{Score} = \frac{X\,(I) - minimum\ X\,(I)}{Maximum\ X\,(i) - Minimum\ X\,(I)}$$

Operating ratio converted with below formula, as lower the operating ratio being better profitability and Vice-Versa

$$\text{Score} = 1 - \frac{X\,(I) - minimum\ X\,(I)}{Maximum\ X\,(i) - Minimum\ X\,(I)}$$

X (I) = Value of financial ratio in each year of study period

Maximum X (I) = Maximum value of financial ratio during entire period of study except Merger year

Minimum X (I) = Minimum value of financial ratio during entire period of study except Merger year

Combination of all ratios based on index score as calculated above was done by computing averages for each year for each sample company.

Later on Average composite index score had been calculated based on combine average scores during Pre-Merger and Post- Merger Period

Average Composite Index score for Pre- Merger and Post-Merger period was compared for each sample company.

Higher the composite Index score, better the performance and vice versa. Success or failure of each Acquirer company was determined on the basis of change in Average Composite Index Score.

Each score has been tested applying Independent Sample T test.

[3] Shareholders wealth Measurement

Economic value added "EVA" is one of the measure to see if ultimate objective of any company i.e. to attain wealth maximization has been achieved or not. Various Corporate actions are planned and undertaken to increase profitability and wealth of the said business. Mergers and Acquisitions is also one of the corporate restructuring activity with ultimate goal to achieve wealth maximization.

Attempt has been made in said study to measure what is change in EVA on the account of Merger and Acquisition in each case.

EVA is a measurement which shows company's earning in excess of cost of capital.

Formula to calculate EVA

EVA = Operating Profit-Cost of Capital Employed

= NOPAT- (WACC*Capital employed)

= NOPAT- [Equity *Ke/Kr+ Preference capital*Kp+ Debt*Kd (1-t)]

- Preference capital = Preference share capital issued by company if any
- Kp = cost of Preference share capital
- Debt = Debt funds employed by company
- Kd = Cost of Debt after adjusting tax i.e 1-t
- Equity = Equity share Capital and Reserves and Surplus
- Ke /Kr = Cost of Equity capital and Reserves and Surplus are assumed to be same
- Ke was estimated using Capital Asset Pricing Model:
- $Ke = Rf + \beta i (Rm-Rf)$
- Where Ke = Cost of Equity

- Rf = Risk Free Rate of Return
- Rm = Rate of Return on Market Index
- βi = Beta coefficient

The Rf was taken as 7.97% while Rm was taken as 14%. For the purpose of calculating risk free rate of return, the Central Government Securities [Weighted AVG] yield on the 16year government bond from 2000- 01 till 2015-16 was considered using the average of central government securities (Percent per annum) for the sample period of study. Data was collected from Reserve Bank of India records. For calculating the market rate of return, the compounded annual growth rate (CAGR) in BSE Sensex was taken from in 2000-01 to in 2015-16. Data was collected from CMIE Prowess database regarding S&P BSE Sensex

Beta Values were also collected from the CMIE Prowess database. It shows the slope of the regression line derived by regressing the weekly returns of script against the weekly returns on the 'CMIE Overall Share Price Index.

MVA is modified version of EVA as the value is more related to market. MVA is calculated as Market value of the capital employed in the firm with less book value of capital employed. Economic Value Added and Market Value Added has been computed to examine impact of Merger on Shareholders wealth in post-merger period. Hypothesis framed are tested using one sample t test for all individual sample companies.

[4] Altman Z Score

It is very important to undertake overall financial health assessment of any company to understand if particular strategic decision taken by company helps to improve overall financial health of company or not? An attempt has been made in this study to check financial health of company prior to merger or Acquisition and after Merger and Acquisition.

A financial health reflects company's health in financial aspects, such as health in terms of profitability, financing, liquidity, asset utilization, and market value. Financial statements are a prime source of information about financial health (Ross et al., 2013) It is imperative to do financial health assessment to measure company's health so that required action can be taken and it helps in investment decision. Managers will therefore be able to identify the factors that may improve company's financial health. There are at present various measures which help to make assessment of financial health of companies like Bonitu B Index and The Springate mode etc. but oldest and renowned one is Altman Z score.

Altman's Z-Score model is measurement that is used to predict the chances of a business going bankrupt in near future. This model was developed by **American Finance Professor Edward Altman** in 1968, which helps to check financial stability of companies.

Usually, the lower the Z-score, the more probability that a company is heading for bankruptcy. A Z-score lower than 1.8 means that the company is in financial distress and with a high chance of going bankrupt. On the other hand, a score of 3 and above means that the company is in a safe zone and is not likely to file for bankruptcy. A score of between 1.8 and 3 means that the company is in a grey area and with a moderate chance of bankruptcy.

(https://corporatefinanceinstitute.com/resources/knowledge/credit/altmans-z-score-model/Retrieved on 19/01/2022, 2022)

The Altman's Z-score formula is written as follows

ζ =1.2A+1.4B+3.3C+0.6D+1.0E

Where:

Z is the Altman's Z-score

A= Working Capital/Total Assets ratio

B= Retained Earnings/Total Assets ratio

C= Earnings Before Interest and Tax/Total Assets ratio

D= Market Value of Equity/Total Liabilities ratio

E= Total Sales/Total Assets ratio

For calculating above ratios averages of Pre-Merger and Post-merger period for each variable has been taken into account. The Period of study is from 2001-2016. The Merger or Acquisition completion year is denoted as year 0. Years prior to Merger or Acquisition are considered pre-merger deal years; and years after Merger or Acquisition are taken as Post-Merger deal years while doing study on individual acquirer firm. An attempt has been made to assess company's financial health and changes in same due to Merger.

[5] Regression Analysis

In order to understand impact of Merger and Acquisition on financial performance of selected sample companies one dependent variable i.e. Net profit and 9 independent variables viz Cost of goods sold, Operating Expenses, Finance cost, Capital employed, Long term borrowings, Shareholders fund, working capital, Current assets and fixed assets have been selected. Multiple linear Regression equation for each sample company for Pre and Post-merger period has been framed to understand how it has been affected

and which variables are dominantly changed on account of merger. Two approaches were used to derive multiple linear regression equation; Stepwise approach is used to derive a model However whenever required Enter Approach is used to get best fit model.

After deriving models and identifying variables significantly affecting profitability of sample companies in Pre-Merger and Post-Merger period, an attempt is made to identify common variables affecting Net profit in Pre-Merger and Post-Merger period and correlation coefficient is calculated between this independent variables and Net profit in Pre-Merger period and Post-Merger period to understand how far its impact has changed on account of merger.

[B] Consolidated performance of all selected 7 companies

All selected sample company's financial performance in the form of ratios have been combined in the form of averages and compared for Pre-Merger and Post-Merger period. For the purpose of analysis Pre-merger period [2000-2001 to 2004-2005] and Post-merger period [2011-2012 to 2015-2016] has been considered.

Paired T test has been applied to test the hypothesis framed for consolidated data One way annova has been applied to study difference of means during Pre-merger period [2000-2001 to 2004-2005], during merger period [2005-2006 to 2010-2011] i.e. sample selection period and post-merger period [2011-2012 to 2015-2016].

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