5. Research Methodology and Sources of Data:

5.1 Data collection:

The required data for this study have been collected from different sources. The data regarding the operational and financial performance of the concerned companies for each year have been collected from the consolidated annual financial statements of the companies like Balance Sheet, Profit and Loss Account (Income statement) etc. published in the Annual Reports of the company for relevant years. The stock market performance data and market capitalization data of these companies for relevant years have been collected from the publications of Bombay Stock Exchange (BSE). Other sources of data are: the publications of Reserve Bank of India (RBI), and the websites of the concerned companies. Information has been also collected from the periodicals like Business World, Business Today etc. and financial news papers like Economic Times, Financial Express etc.

5.2 Data Analysis Methodology:

All the collected data regarding the individual cases have been analyzed and studied in two parts.

Part-I The first part of the data analysis consists of 2 steps (steps 1 & 2) to look into the increase or decrease in the operational and financial synergy of the company's operations in the years immediately after the Merger or Acquisition deal has been executed.

Step-1: The first step in the first part of the data analysis which looks into the operational synergy aspect has been done by studying the increase or decrease in Gross Profit Margin (GPM), Net Profit Margin (NPM) and Return on Capital Employed (ROCE) post M&A deal. The cost savings are reflected in the Cost of Production as a percentage of Sales (COP/Sales) pre and post deal. The definitions of the terms used here are as follows:

(i) GPM = Gross Profit/Net Sales

= (Profit before Depreciation Interest & taxes i.e. PBDIT) / Net Sales

(ii) NPM = Net Profit (Profit after Taxes i.e. PAT)/ Net Sales

(iii) ROCE = (Profit before Interest & taxes i.e. PBIT/ Capital Employed

= PBIT/ (Net Worth + Total Debt)

(iv) COP/Sales = Cost of Production / Sales (To measure Cost savings)

Step 2. The second step in the first part of the data analysis which looks into the financial synergy aspect has been studied through looking into the changes in Operating Cash Flows (OCF) and Debt –Equity ratios.

OCF is defined as Profit after Tax adjusted for non cash expenditures like depreciation.

Part II. The second part of the data analysis consists of 4 steps (steps 3, 4, 5 and 6) looking into the changes in shareholder's return and shareholder's wealth after the Merger or Acquisition deal. This would help us to find out whether the expected synergies of M&A have actually translated into shareholder's return & wealth.

Step 3: In step no. 3, which is the first step in the second part of data analysis we try to find out the changes in shareholder's return. The parameter used for this purpose is Return on Equity (ROE). The model adopted is the basic Du Pont model as modified by Weston and Brigham linking Return on Investment (ROI)

to ROE. While Du Pont's ROI is a function of Asset Turnover (ATO) and Net Profit Margin (NPM), Weston and Brigham have incorporated Equity Multiplier (EQM) into the model to compute the ROE. The equation used is

$$ROE = (NPM) \times (ATO) \times (EQM)$$

Where, ATO = Sales / Assets

EQM = Assets / Net worth

Using this model, ROE has been computed for pre and post M&A deal years and pre and post acquisition averages have been compared to see whether shareholder's returns have been improved or not.

In step no.4 and step no. 5, we try to examine whether the concerned Merger or Acquisition has actually added to share holder's wealth.

Step 4: The Wealth Added Index (WAI): It is a period measure built on the intuitive understanding that wealth is created for shareholders only when their returns exceed the cost of equity. Cost of equity is the minimum rate of return that investors would expect for investing their funds in a company's shares rather than elsewhere. Ideally speaking, it is the risk adjusted rate of return as given by the Capital Asset Pricing Model (CAPM). The WAI measures the increase in share prices over the period minus the required return. It adds the benefits accumulated over the period of the index in terms of dividends pay outs from the company. It also incorporates the expectations of the investors who have purchased new shares in calculating the required return.

Therefore, WAI = Growth in Market Capitalization + Dividends –

Required returns - New shares issued

Steps in calculating WAI :

a. At first the Market Capitalization figures of the concerned company for each year is collected from the publications of the BSE.

b. Then the change or growth in Market Cap is arrived at by deducting the previous year's market cap from that of the current year. (i.e.; MVt-MVt-1)

c. Equity capital figures were extracted for all the years in order to ascertain the issue of new shares. Any increase in equity capital has been taken at face value for the purpose of ascertaining the value of new shares.

d. To determine the cost of equity the market adjusted return method is used. This method basically holds that the predicted or expected rate of return on a stock is just the return on the market index for the period. Using the weekly Sensex data for the years under consideration, market rate of return were computed. However the results are seen to be highly volatile and negative. Hence on a conservative basis, the average rate of Prime Lending Rates (PLR) of 5 top Public Sector Banks for the relevant years (sourced from RBI Reports) have been taken as the expected market return, since in the real life's actual practice, the cost of equity is always at a risk premium to the cost of debt and can never be negative.

e. Computation of required return for each year has been calculated as (MVt-1) multiplied by the cost of equity in the previous year plus new shares if any multiplied by the cost of equity in the current year.

f. Dividend data for each year has been taken from the income statements of the companies concerned.

g. All the components of the WAI equation thus arrived at, have been plugged into the equation and WAI for each year is calculated and the cumulative figure is found out.

Step 5: Economic Value added (EVA): According to Stern – Stewart & Co., EVA is basically Net Operating Profit after Tax minus the Capital charge. The company defines Nopat as profits derived from the company's operations after taxes but before financing costs and noncash book keeping entries (except depreciation as depreciation is considered a true economic expense). The company suggests conversion of accounting profits to economic profits through adjustments.

Therefore EVA = Nopat – Capital charge

$$= \text{Nopat} - k*C$$

Where k = weighted average cost of capital

C = invested capital (i.e. interest bearing debt plus net worth)

Nopat = PBIT * (1-t), where t = effective tax rate

Nopat = PAT + Interest

t = Provision for tax / PBT Alternatively

EVA = (r-k) * Invested capital

Where r = Nopat / Invested capital

Here (r-k) represents the spread between the return earned by the company and cost of capital which shows whether the company has earned a return from its operations that is more than the cost of capital.

Step 6: Future Growth Value (FGV):

Steps in FGV analysis:

a. The market value of the company in the year just prior to the Merger or Acquisition being affected is taken as MVo.

b. Then the Current Operations Value COV is determined. For this purpose Capo (Book capital) is taken as net worth plus interest bearing debt in the year 0 i.e.; in the year prior to the merger or acquisition. Then EVA for the year 0 is determined, capitalized at the weighted average cost of capital of that year and the resulting figure is then added to Capo to get COV

Therefore COV = Capo + (EVAo / k)

c. Then the Future Growth Value FGV of the company, i.e.; expectational component (or the expectations of the investors) is calculated as FGV = (MVo – COV)

d. The actual EVA is then calculated for each year post M&A for which data is available. The year to year improvement in EVA (or ΔEVA) are calculated and the Present Value of these improvements is determined using the weighted cost of capital. The present value of EVA improvements is then capitalized to perpetuity by multiplying with a factor of (1+k) / k and this is equal to the Actual FGV achieved post deal.

e. The last step is to compare the Actual FGV obtained in step d with the expected FGV calculated in step c. If the actual FGV is greater than the expected FGV it can be concluded that the Merger or Acquisition has resulted in an addition to shareholder's wealth.

Definition of the terms used:

Post tax cost of debt kd=Interest (1-t)/debt (where t=effective tax rate)

Weighted Average Cost of Capital = kd * (debt / capital) + ke * (net worth / capital)

ke = Cost of equity (ke has been arrived at similar to WAI computations)

Actual FGV = (1+k) / k * $\sum$ [(Δ EVA / (1+k/100) t]

5.3 Case 1: Acquisition of Indo Burma Petroleum Company Ltd. (IBP Co. Ltd by Indian Oil Corporation Ltd. (IOCL) :

5.3.1 Deal Snapshot:

Acquirer Company: In this case the acquirer company is a Public Sector Unit (PSU) IOCL. It is the state owned petroleum refining and marketing major. It is the country's largest commercial enterprise with sales over Rs.130203 crores and profits of Rs. 7005 crores for fiscal 2003. Indian oil is country's No.1 Company in Fortune's prestigious listing of world's 500 largest corporations and ranked 189 for the year 2004.

Acquired or Target Company: IBP Co. Ltd. is a pure petro marketing company in the public sector without its own refineries. It has got a retail network of more than 1550 retail outlets selling more than 4 million tons of petro products per annum which accounts for about 10% of market share. During the year 2002-2003 the

company recorded a turnover of Rs. 8753 crores and a net profit of Rs. 87.75 crores.

The Deal: As a part of its disinvestment program Govt. of India invited for international competitive bids for the sale of its stake holding in IBP Co. Ltd. IOCL acquired 33.58 % of the 59.8 % of Govt. of India's shareholding at a price of Rs.1551.25 per share and management control in Feb.2002. The total consideration of the deal was Rs. 1153.68 crores. IOCL further acquired an additional 20 % of equity in IBP Co. Ltd. through an open offer from the public under the takeover code hiking its stake to 53.58 %.

5.3.2 Data Analysis:

Based upon data analysis methodology brought out at para 5.2 above, data analysis for this case has been carried out as below:

Data collected: Acquirer Company: IOCL

IOCL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	778.7	778.7	778.7	778.7	1168.0
Reserves &Surpluses	13286.1	15192.3	14532.4	18149.3	21879.4
Net Worth	14064.8	15971.0	15311.1	18928.0	23047.4
Loan Funds :					
Secured Loans	3850.6	4713.3	4617.0	4701.1	3175.2
Unsecured Loans	10866.8	15922.5	14453.0	9794.0	9003.4
Total Debt	14717.4	20635.8	19070.0	14495.1	12178.6
Total Capital Employed	28782.2	36606.8	34381.1	33423.1	35226.0
Total Assets	28782.0	36607.0	37786.0	37296.0	39509.
Income :					
Net sales/Turnover	94141.0	117371.0	114864.0	105036.6	113698.4
Total income	95824.0	122433.8	115716.50	112977.3	119175.3
Expenditure :					
Cost of Production/sales	89853.0	116573.8	108193.1	102144.5	107157.5
PBDIT(Profit Before Depreciation Interest & Tax)	5971.0	5860.0	7523.4	10832.8	12017.8
Depreciation	1994.6	1223.4	1379.6	1656.3	1873.8

PBIT	3976.4	4636.6	6143.8	9176.5	10144.0
Interest	1006.0	1674.0	1544.4	762.5	452.7
PBT(Profit Before Tax)	2970.4	2962.6	4599.4	8414.0	9691.3
Taxes	527.2	242.3	1714.7	2299.1	2686.4
PAT (Profit After Tax)	2443.4	2720.3	2884.7	6114.9	7004.8
Dividends	584.0	739.7	856.5	2258.2	2452.8
EPS	20.92	23.29	24.70	52.35	59.97
GPM	6.3	5.0	6.6	10.3	10.6
NPM	2.6	2.32	2.5	5.8	6.2
ROCE	13.8	12.7	17.9	27.5	28.8
D/E	1.05	1.29	1.25	0.76	0.53
Market capitalization	NA	108.1	60.2	264.6	3164.5

Data collected: Acquired Company: IBP

IBP	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	22.15	22.15	22.15	22.15	22.15
Reserves &Surpluses	317.1	346.94	423.88	476.71	603.86
Net Worth	339.25	369.09	446.03	498.86	626.01
Loan Funds :					
Secured Loans	41.85	68.99	0.00	0.00	0.00
Unsecured Loans	580.02	371.89	0.00	0.00	0.00
Total Debt	621.87	440.88	0.00	0.00	0.00
Total Capital Employed	961.12	809.97	446.03	498.86	626.01
Total Assets	961.12	809.97	510.41	575.06	709.57
Income :					
Net sales/Turnover	6322.5	8079.7	8039.23	8358.8	10148.19
Total income	6360.2	8362.13	8045.17	8723.3	10233.01
Expenditure : **Cost of Production/sales**	6210.0	8171.3	7690.81	8537.6	9858.47
PBDIT(Profit Before Depreciation Interest & Tax)	150.1	190.8	354.36	185.7	374.54
Depreciation	22.1	40.95	34.87	44.4	41.27
PBIT	128.0	149.84	319.5	141.3	333.3
Interest	81.0	88.62	29.54	0.5	0.68
PBT(Profit Before Tax)	47.0	61.22	289.95	140.8	332.6
Taxes	6.0	7.0	94.16	52.99	117.94
PAT (Profit After Tax)	41.7	54.22	195.79	87.81	214.6
Dividends	10.2	24.41	22.15	31.0	77.52
EPS	18.83	24.48	42.82	39.62	96.92
GPM	2.4	2.4	4.4	2.2	3.7
NPM	0.66	0.70	2.4	1.05	2.1
ROCE	13.3	18.5	71.6	28.3	53.2
D/E	1.83	1.19	0.0	0.00	0.00

Market capitalization	NA	34.9	92.8	199.2	489.8

Data analysis of Acquirer Company IOCL:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	2000-01	2001-02	2002-03	2003-04
GPM %	5.0	6.6	10.3	10.6
NPM %	2.3	2.5	5.8	6.2
ROCE %	12.7	17.9	27.5	28.8
COP/ SALES	99.3	94.2	97.2	94.2

Step 2: Financial Synergy:

Parameter	2000-01	2001-02	2002-03	2003-04
OCF	3943.7	4264.2	7771.2	8878.6
D/E	1.29	1.25	0.76	0.53

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	2000-01	2001-02	2002-03	2003-04
Sales	94141.0	117371	114864	105037	113698
PAT	2443.4	2720.3	2885	6115	7005
Assets	28782	36607	37786	37296	39509
Net worth	14065	15971	15311	18928	23047
NPM %	2.6	2.32	2.5	.8	6.2
ATO %	327	321	304	282	288
EQM %	205	229	247	197	171
ROE %	17.4	17.0	18.8	32.2	30.5
EPS (Rs.)	20.92	23.29	24.70	52.35	59.97

Average ROE (Pre-Acquisition) = 17.2 %

Average ROE (Post Acquisition) = 27.2 %

Average EPS (Post Acquisition) = 22.1

Average EPS (Post Acquisition) = 45.67

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	2000-01	2001-02	2002-03	2003-04
MV	108.0	60.2	264.6	3164.5
MV growth	NA	(-48)	205	2900
Dividends	739.7	856.5	2258.2	2452.8
Cost Of Equity %	12	12	11.5	11
Required Return	NA	13	7	73
Addition To equity	0.0	0.0	0.0	389.34
WAI	NA	+796	+2456	+5191

Cumulative WAI (Post Acquisition) = +8443

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	2000-01	2001-02	2002-03	2003-04
PBIT	4636.6	6143.8	9176.5	10144.0
Interest	1674.0	1544.4	762.5	452.7
PBT	2962.6	4599.4	8414.0	9691.2
Tax	242.3	1714.7	2299.0	2686.4
PAT	2720.3	2884.7	6114.9	7004.8
Net Worth	15971.0	15311	18928	23047
Debt	20636	19070	14495	12179

Capital	36607	34381	33423	35226
Effective tax Rate %	8.2	37.3	27.3	27.7
Nopat	4394	4429	6878	7458
Post Tax kd	8.84	12.91	7.24	5.14
Cost of Equity ke	12	12	11.5	11
K=WACC	10.22	12.5	9.65	8.98
EVA	652	131	4459	4294
Δ EVA	NA	(-521)	+4328	(-165)

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in (2000-01) year just before the takeover   =   108.1

         COV   =   42987

         Expected FGV   =   (-42879)

         Actual FGV Achieved   =   32462

         Difference   =   +75341

Data analysis of Acquired Company IBP:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	2000-01	2001-02	2002-03	2003-04
GPM %	2.4	4.4	2.2	3.7
NPM %	0.7	2.4	1.0	2.1
ROCE %	18.5	71.6	28.3	53.2
COP/ SALES	101	95.6	102	97.1

Step 2: Financial Synergy:

Parameter	2000-01	**2001-02**	2002-03	2003-04
OCF	95.17	230.66	132.20	255.86
D/E	1.19	0.0	0.00	0.00

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	2000-01	**2001-02**	2002-03	2003-04
Sales	6322.5	8079.7	8039.2	8358.8	10148.2
PAT	41.7	54.2	195.8	87.8	214.6
Assets	961.1	810.0	510.4	575.1	709.6
Net worth	339.3	369.1	446.0	498.9	626.0
NPM %	0.66	0.7	2.4	1.05	2.1
ATO %	658	998	1576	1454	1429
EQM %	283	220	114	115	113
ROE %	12.3	15.4	43.4	17.6	33.9
EPS Rs.	18.83	24.48	42.82	39.62	96.92

Average ROE (pre-Acquisition)   = 13.9 %

Average ROE (Post Acquisition)   = 31.5 %

Average EPS (Post Acquisition)   =   21.66

Average EPS (Post Acquisition)   = 59.80

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	2000-01	**2001-02**	2002-03	2003-04
MV	34.9	92.8	199.2	489.8
MV growth	NA	57.9	106.4	290.6
Dividends	24.4	22.1	31.0	77.5

Cost Of Equity %	12	12	11.5	11
Required Return	NA	4.0	11	23
Addition To equity	0.0	0.0	0.0	0.0
WAI	NA	76	126	346

Cumulative WAI   (Post Acquisition)   =   +548

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	2001-02	**2001-02**	2002-03	2003-04
PBIT	149.8	319.5	141.3	333.3
Interest	88.6	29.5	0.5	0.7
PBT	61.2	290.0	140.8	332.6
Tax	7.0	94.2	53.0	117.9
PAT	54.2	195.8	87.8	214.6
Net Worth	369.0	446.0	498.9	626.0
Debt	440.9	0.0	0.0	0.0
Capital	810.0	446.0	498.9	626.0
Effective tax Rate %	11.5	32.4	37.6	35.4
Nopat	143	225	88	215
Post Tax kd	22.8	0.0	0.0	0.0
Cost of Equity ke %	12	12	11.5	11
K=WACC	17.88	12	11.5	11.0
EVA	(-2.0)	171	31	146
Δ EVA	Na	173	(-140)	115

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in (2000-01) year just before the takeover = 34.9

COV = 799

Expected FGV = (-764)

Actual FGV Achieved = 824

Difference = (+1588)

The summary of data analysis is brought out below:

Table-5.1: Average of data analysis Parameters Pre and Post M&A Years

Operational Synergy								
Companies	GPM		NPM		ROCE		COP/Sales Ratio	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
IOC	5	9.16	2.3	4.83	12.7	24.73	99.3	95.2
IBP	2.4	3.43	0.7	1.83	18.5	51.03	101	98.23
Financial Synergy								
	OCF				DE Ratio			
	Pre		Post		Pre		Post	
IOC	3943.7		6971.33		1.29		0.85	
IBP	95.17		206.24		1.19		0	
Shareholder's Return & Shareholder's Wealth Creation Analysis								
	WAI		EVA		FGV			
	Pre	Post	Pre	Post	Expected		Actual	
IOC	12.7	24.73	99.3	95.2	-42879		75341	
IBP	18.5	51.03	101	98.23	-764		824	

5.3.3 Observations of Data Analysis:

Motives and driving forces for Acquisition: IBP was a pure marketing company without its own refining capacities whereas IOCL is a refining and marketing company. Traditionally IBP has had a strong presence in the retail segment especially in metros and urban area, whereas IOCL has a formidable presence in the consumer segments as well as the high volume, high growth highway retail sector. Thus there is a synergy in the retail sector. Thus the most obvious reason

for IOCL acquiring IBP at a high premium is the 1550 odd retail outlets of IBP, some of them in excellent city locations.

At the time of acquisition IOCL used to supply over 3 million tons of products to IBP and this would have been affected if the company had been acquired by somebody else. Another important reason is that by acquiring IBP, IOCL has denied strategic space to competitors. The retail infrastructure that comes with IBP acquisition would otherwise take a minimum of 5 years to build. The market share of IOCL-IBP combine is expected to rise to 56 %. Sharing of knowledge, human resources, systems and procedures including launching joint marketing strategies would result in positive synergies at most optimum cost .The resultant enhancement of intellectual capital is expected to increase the competitiveness of both the organizations.

The Data Analysis from the Acquirer Company's viewpoint shows that there has been a substantial improvement in IOCL's operational and financial performance after acquisition. All the indicators like GPM, NPM, ROCE etc. show an accelerated increasing trend.

As far as the shareholders of IOCL are concerned, there is an improvement in the shareholder's return and wealth post acquisition. Both WAI analysis and EVA analysis show that there is a positive accumulation of wealth and shareholders have benefited because of the acquisition.

The Data Analysis from the Acquired or Target Company's point of view gives a mixed result. The profitability indexes like GPM, NPM were highest in the year

of acquisition but came down drastically in the next year, again improving thereafter.

However the shareholders of IBP benefited from the association with IOCL. This is revealed by the improvement in shareholder's return as indicated by higher ROE post acquisition and positive accumulation of shareholders wealth.

From this analysis it appears that IOCL's acquisition of IBP can be considered as successful because the acquirer company IOCL was able to achieve the operational and financial synergies and shareholders of both IOCL and IBP benefited from this deal.

5.4 **Case 2: Acquisition of Mangalore Refineries and Petrochemicals Ltd. (MRPL) by Oil and Natural Gas Corporation Ltd. (ONGCL):**

5.4.1 **Deal Snapshot:**

Acquirer Company: ONGC is a PSU and functions as the primary arm of the Government in exploration and exploitation of India's petroleum reserves. ONGC ranks as the second biggest E&P Company and topper from India in the Forbes 400 list in 2004 It is the only company in India to have earned a net profit of over Rs. 10000 crores in 2002-2003 and contributes over 84 % of India's oil & gas production.

Acquired or Target Company: MRPL is the country's first joint venture refinery promoted by both public and private sector together. The company was promoted by Hindustan Petroleum Corporation Ltd. On the one part and Indian Rayon Industries, Grasim Industries Ltd., Hindalco Industries Ltd. and Indo Gulf

Fertilizers Ltd. all belonging to Aditya Birla Group .The Company operates a coastal refinery in Mangalore with a capacity of 9 million tons per annum. Because of the heavy high cost debt burden in its capital structure and sub optimal capacity utilization the company was incurring losses continuously. MRPL had posted a net loss of Rs. 412 crores in 2002-03 and with continuous erosion of net worth MRPL was on the verge of being referred to BIFR by the end of FY 2002-03.

The Deal: In June 2002 Govt. of India asked ONGC Ltd. to explore the possibility of taking over MRPL. ONGC acquired 29.7 crores shares of MRPL accounting for 37.4 % of equity stake from Aditya Birla Group at a price of Rs. 2 per share and acquired management control .ONGC further pumped in Rs. 600 crores as fresh equity into MRPL increasing its stake to 51 %. As a part of Debt Restructuring Package ONGC purchased 35.6 crores of shares from institutional investors at face value and increased the stake to 71.5 %. The total money invested by ONGC into MRPL comes to about RS. 1041 crores.

5.4.2 Data Analysis:

Based upon data analysis methodology brought out at para 5.2 above, data analysis for this case has been carried out as below:

Data collected: Acquirer Company: ONGC Ltd.:

ONGC Ltd.	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	1425.93	1425.93	1425.93	1425.93	1425.93
Reserves &Surpluses	25384.32	28885.36	28296.25	34313.03	39117.17
Net Worth	26810.25	30311.29	29722.18	35738.96	40543.09

Loan Funds :					
Secured Loans	368.13	208.5	0.00	0.00	0.00
Unsecured Loans	6727.14	4271.24	3510.84	800.23	3378.59
Total Debt	7095.27	4479.74	3510.84	800.23	3378.59
Total Capital Employed	33905.52	34791.02	33233.02	36539.19	43921.68
Total Assets	34005.20	34791.02	3858.08	41774.03	57792.94
Income :					
Net sales/Turnover	19992.03	23179.10	22528.42	34229.53	32076.01
Total income	20090.64	25215.98	24558.70	36288.27	33597.32
Expenditure : **Cost of Production/sales**	9278.17	10476.62	10291.50	13796.15	14215.92
PBDIT(Profit Before Depreciation Interest & Tax)	10812.47	14739.36	14267.20	22492.12	19381.41
Depreciation	4252.3	5059.12	4127.23	6262.34	5695.04
PBIT	6560.17	9680.24	10139.97	16229.78	13117.03
Interest	600.3	523.4	284.74	146.59	47.96
PBT(Profit Before Tax)	5959.87	9156.85	9855.23	16083.19	13609.07
Taxes	2330.4	3928.07	3657.35	5594.52	4944.62
PAT (Profit After Tax)	3629.47	5228.78	6197.88	10529.33	8664.45
Dividends	926.86	1568.53	1996.31	427.80	3422.24
EPS	25.45	36.67	43.47	73.84	60.76
GPM	54.0	63.6	63.3	65.70	60.4
NPM	18.2	22.6	27.5	30.8	27.01
ROCE	19.35	27.8	30.51	44.4	31.1
D/E	0.26	0.15	0.12	0.02	0.28
Market capitalization	NA	NA	145	1802	13321

Data collected: Acquired Company: MRPL:

MRPL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	792.15	792.53	792.16	1759.60	1752.61
Reserves &Surpluses	173.76	-(11.29)	(-325.69)	(-737.50)	(-278.08)
Net Worth	965.91	780.86	466.47	1022.10	1474.53
Loan Funds :					
Secured Loans	5015.72	4995.03	4990.67	4431.04	1782.09
Unsecured Loans	392.58	56.63	753.45	964.14	3062.21
Total Debt	5408.30	5051.65	5744.12	5395.18	4844.30
Total Capital Employed	6374.21	5832.51	6210.59	6417.29	6318.83
Total Assets	6374.21	5832.51	7009.73	7601.79	6955.15
Income :					

Net sales/Turnover	3216.02	2883.59	5353.91	8058.77	11390.64
Total income	2971.86	2896.15	5505.29	8204.58	11998.67
Expenditure : **Cost of Production/sales**	2846.42	2773.72	5248.56	7916.54	10672.56
PBDIT(Profit Before Depreciation Interest & Tax)	125.44	122.43	256.73	288.04	1326.11
Depreciation	99.57	162.70	363.35	373.74	378.19
PBIT	25.87	(-40.27)	(-106.62)	(-85.70)	947.92
Interest	325.55	237.83	672.29	567.07	373.19
PBT(Profit Before Tax)	(-299.68)	(-278.10)	(-778.91)	(-652.77)	574.50
Taxes	0.024	0.034	0.00	0.00	115.09
PAT (Profit After Tax**)**	(-299.70)	(-278.13)	(-492.48)	(-411.81)	459.41
Dividends	0.00	0.00	0.00	0.00	0.00
EPS	(-3.78)	(-2.34)	(-6.20)	(-5.15)	1.44
GPM	3.9	4.25	4.8	3.57	11.64
NPM	(-9.32)	(-9.65)	(-9.20)	(-5.11)	4.03
ROCE	0.40	(-0.70)	(-1.72)	(-1.34)	15.0
D/E	5.6	6.47	12.31	5.34	3.29
Market capitalization	NA	NA	4.1	19.8	927.20

Data analysis of Acquirer Company ONGC:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	2001-02	**2002-03**	2003-04
GPM %	63.3	65.7	60.4
NPM %	27.5	30.8	27.0
ROCE %	30.5	44.4	31.1
COP/ SALES	45.7	38.0	44.3

Step 2: Financial Synergy:

Parameter	2001-02	**2002-03**	2003-04
OCF	10325	16792	14359.5
D/E	0.12	0.02	0.28

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	2000-01	2001-02	**2002-03**	2003-04
Sales	19992	23179	22528	34230	32076
PAT	3629	5229	6198	10529	8664
Assets	34005	34791	38580	41774	57793
Net worth	26810	30311	29722	35739	40543
NPM %	18.2	22.6	27.5	30.8	27.0
ATO %	58.8	66.6	58.4	81.9	55.5
EQM %	127	115	130	117	143
ROE %	13.6	17.3	20.9	29.5	21.4
EPS (Rs.)	25.45	36.67	43.47	73.84	60.76

Average ROE (Pre-Acquisition)   =   17.3 %

Average ROE (Post Acquisition)   =   25.5 %

Average EPS (Post Acquisition)   =   35.2

Average EPS (Post Acquisition)   =   67.3

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	2001-02	**2002-03**	2003-04
MV	145	1802	13321
MV growth	NA	1657	11519
Dividends	1996	4278	3422
Cost Of Equity %	12	11.5	11
Required Return	NA	17	207
Addition To equity	0.0	0.0	0.0

WAI	NA	5918	14734

Cumulative WAI   (Post Acquisition)   = + 20652

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	2001-02	**2002-03**	2003-04
PBIT	10140	16230	13117
Interest	285	147	48
PBT	9855	16083	13609
Tax	3657	5595	4945
PAT	6198	10529	8664
Net Worth	29722	35739	40543
Debt	3511	800.0	3379
Capital	33233	36539	43922
Effective tax Rate %	37.1	34.8	36.3
Nopat	6483	10676	8712
Post Tax kd	12.9	28.2	2.2
Cost of Equity ke	12	11.5	11
K=WACC	12.1	11.87	10.3
EVA	2463	6340	4190
Δ EVA	NA	3877	(-2150)

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in   (2001-02) year just before the takeover   =   145

COV   =   53588

Expected FGV   =   (-53443)

Actual FGV Achieved   =   15740

Difference   =   + 69183

Data analysis of Acquired Company MRPL:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	2001-02	**2002-03**	2003-04
GPM %	4.8	3.6	11.6
NPM %	(-9.2)	(-5.1)	4.0
ROCE %	(1.7)	(-1.3)	15.0
COP/ SALES	98	98	93.7

Step 2: Financial Synergy:

Parameter	2001-02	**2002-03**	2003-04
OCF	(-129.1)	(-38.1)	837.6
D/E	12.31	5.34	3.29

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	2000-01	2001-02	**2002-03**	2003-04
Sales	3216	2883.6	5354	8058./8	11391
PAT	(-299.7)	(-278.1)	(-492.5)	(-411.8)	459.4
Assets	6374	5832.5	7009.7	7601.8	6955.2
Net worth	965.9	780.9	466.5	1022.1	1474.5
NPM %	(-9.32)	(-9.65)	(-9.20)	(-5.11)	4.03
ATO %	50.5	49.4	76.4	106	164
EQM %	660	747	1501	744	472
ROE %	(-31)	(-35.6)	(-106)	(-40.3)	31.2
EPS (Rs.)	(-3.78)	(-2.34)	(-6.2)	(-5.15)	1.44

Average ROE (Pre-Acquisition)   =   (-57.5)   %

Average ROE (Post Acquisition)   =   (-4.6)   %

Average EPS (Post Acquisition)   =   (-4.1)

Average EPS (Post Acquisition)   =   (-1.86)

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	2001-02	**2002-03**	2003-04
MV	4.1	19.8	927.2
MV growth	NA	15.7	907
Dividends	0.0	0.0	0.0
Cost Of Equity %	12	11.5	11
Required Return	NA	112	2.0
Addition To equity	0.0	967.4	0.0
WAI	NA	(-1064)	905

Cumulative WAI   (Post Acquisition)   =   (-159)

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	2001-02	**2002-03**	2003-04
PBIT	(-106.6)	(-85.7)	947.9
Interest	672.3	567.0	373.4
PBT	(-778.9)	(-652.8)	574.5
Tax	0.0	0.0	115.1
PAT	(-492.5)	(-411.8)	459.4
Net Worth	466.5	1022.1	1474.5
Debt	5744.0	5395.2	4844.3
Capital	6210.6	6417.3	6318.8
Effective tax Rate %	0.0	0.0	20.0
Nopat	179.8	155.2	832.8

Post Tax kd	11.7	10.5	7.7
Cost of Equity ke	12	11.5	11
K=WACC	11.7	10.66	8.47
EVA	(-547)	(-529)	298
Δ EVA	NA	18	827

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in (2001-02) year just before the takeover = 4.0

COV = 1536

Expected FGV = (-1532)

Actual FGV Achieved = 6864

Difference = +8396

The summary of data analysis is brought out below:

Table-5.2: Average of data analysis Parameters Pre and Post M&A Years

Operational Synergy								
Companies	GPM		NPM		ROCE		COP/Sales Ratio	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
ONGC	63.3	63.05	27.5	28.9	30.5	37.75	45.7	41.15
MRPL	4.8	7.6	-9.2	-0.55	1.7	6.85	98	95.85

Financial Synergy				
	OCF		DE Ratio	
	Pre	Post	Pre	Post
ONGC	10325	15575.75	0.12	0.15
MRPL	-129.1	399.75	12.31	4.31

Shareholder's Return & Shareholder's Wealth Creation Analysis					
	WAI		EVA		FGV
	Pre	Post	Pre	Post	Expected	Actual
ONGC	5918	10326	2463	8435	-53443	69189
MRPL	-1064	-79.5	-547	-115.5	-1532	6864

5.4.3 Observations of Data Analysis:

Driving forces and motives of acquisition: Even though ONGC's acquisition of MRPL was a negotiated deal prompted by GOI's efforts to save MRPL there are several factors which made MRPL very attractive for ONGC. As a company ONGC was a sectorial oil company with only upstream operations in exploration and production of crude oil. Oil sector is a highly risky business and general trend in the world is to integrate vertically to dampen the fluctuations in earnings. In the present era of liberalization ONGC found its main weakness is in marketing field where it was totally dependent on others like IOC, BPCL, HPCL & GAIL.

MRPL offered a unique, very attractive opportunity and fit in very well in ONGC's scheme of vertical integration. MRPL is a capital intensive technologically advanced state of the art refinery and ONGC would gain majority ownership with an investment of about Rs. 1100 crores. ONGC's acquisition cost of MRPL is about Rs. 90-100 crores per million ton and if it were to set up a similar Greenfield refinery it would cost Rs. 1100 crores per million tons.

ONGC will be the first refiner in the country to have captive crude access. Captive refining will provide competitive advantage for marketing. Assured sourcing pf product from MRPL is expected to facilitate ONGC's entry into retail marketing MRPL's acquisition provides ONGC an opportunity to develop a geographically focused marketing base in west coast as well as focus on exports.

Since ONGC has been making sizeable profits over last few years while MRPL has been bleeding in the same period a probable future merger would help   set off past

losses of MRPL against profits of ONGC there by resulting in a lower tax liability for ONGC .

The Data Analysis from the acquirer company's point of view shows that the acquisition of MRPL put some strains on the finances of ONGC. When compared to the year of acquisition all the indicators of performance like GPM, NPM, ROCE etc. came down in the year post acquisition. There was a reduction in OCF also. However it should be kept in mind that there is another important factor contributing to the decline in these figures namely the oil subsidy bill born by ONGC.

Acquisition of loss making MRPL did not affect adversely the fortunes of shareholders of ONGC. The shareholder's return (ROE) improved from 17.3 % in pre-acquisition period to 25.5 % in post-acquisition period. Further there was a positive accumulation of wealth as revealed by WAI and EVA analysis. The actual FGV achieved far exceeds the expected FGV.

The Data Analysis from the Acquired or Target Company's point of view shows that the acquisition by ONGC came as a big boon for MRPL. Equity infusion by ONGC and debt restructuring have resulted in a big turnaround of MRPL (Company made a net profit of Rs.459 crores in 2003-04). The D/E of MRPL improved tremendously and its cost of capital also came down substantially.

All the indicators of operational and financial performance have changed from negative to positive after the acquisition. The shareholders of MRPL also benefited substantially because of the association with ONGC. Even though average ROE is still in the negative territory post acquisition, this is because of the heavy losses suffered in the previous year. Similar is the case with WAI figures. The real

significance of ONGC's acquisition is revealed by EVA analysis. The actual FGV achieved is far ahead of the expected FGV.

5.5 **Case 3: Acquisition of Indian Petrochemicals Corporation Ltd. (IPCL) by Reliance Industries Ltd. (RIL):**

5.5.1 **Deal Snapshot :**

Acquirer Company: RIL is a part of the greater Reliance Group founded by Late Dhirubhai H. Ambani & Family. It is India's largest private sector business house with total revenues of over Rs. 99000 crores and net profit of Rs. 6200 crores. RIL is India's largest private sector enterprise in terms of sales, net profit, net worth and assets .RIL is a fully integrated energy company with operations in oil & gas exploration and production, refining and marketing, petrochemicals, power & textiles.

Acquired or Target Company: IPCL was promoted by Govt. of India and it is the country's first integrated petrochemicals complex in public sector. IPCL is the pioneering company in India with manufacturing facilities at Vadodara and Gandhar in Gujarat and Nagothane in Maharashtra. Its business comprises of polymers, synthetic fibers, fiber intermediaries, solvents, surfactants industrial chemicals etc.

The Deal: The Govt. Of India as part of its disinvestment program invited for competitive bids for the sale of 26 % of its equity share in IPCL along with management control. Reliance's winning bid for 26 % stake was at a price of Rs. 231 per share aggregating to Rs. 1491crores. Reliance acquired the stake and

management control in June 2002. Reliance acquired an additional 20 % of equity from public through a public offer and now holds 46 % of company's equity.

5.5.2 Data Analysis:

Based upon data analysis methodology brought out at para 5.2 above, data analysis for this case has been carried out as below:

Data collected: Acquirer Company: RIL

RIL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	1053.0	1053.0	1054.0	1396.0	1396.0
Reserves &Surpluses	12636.0	13712.0	26416.0	28978.49	33056.50
Net Worth	13689.0	14765.0	27470.0	30374.49	34452.50
Loan Funds :					
Secured Loans	5988.11	4068.4	14189.0	11776.86	11451.14
Unsecured Loans	5532.13	6067.39	4739.6	7981.45	9493.52
Total Debt	11520.24	10135.79	18928.6	19758.31	20944.66
Total Capital Employed	25209.24	24900.79	46398.6	50132.80	55397.16
Total Assets	25209.24	24900.79	46398.60	52817.54	58871.93
Income :					
Net sales/Turnover	17849.9	25429.3	42122.0	45897.79	51801.53
Total income	20988.0	28391.0	57902.0	49334.49	52334.17
Expenditure : **Cost of Production/sales**	16242.0	22829.0	49244.0	39968.03	41351.29
PBDIT(Profit Before Depreciation Interest & Tax)	4746.00	5562.0	8658.0	9366.46	10982.88
Depreciation	1278.0	1565.0	2816.0	2837.09	3247.02
PBIT	3468.0	3997.0	5842.0	6529.37	7735.86
Interest	1003.75	1211.50	1407.0	1555.16	1434.72
PBT(Profit Before Tax)	2464.25	2785.5	4435.0	4974.21	6301.14
Taxes	61.0	139.50	1192.0	869.0	1141.00
PAT (Profit After Tax**)**	2403.25	2646.00	3243.0	4104.31	5160.14
Dividends	384.08	447.85	663.28	698.19	733.10
EPS	22.47	25.10	23.40	29.25	36.79
GPM	26.6	21.9	20.6	20.4	21.2
NPM	13.5	10.4	7.7	8.9	9.96
ROCE	13.8	16.1	12.6	13.02	14.0
D/E	0.82	0.69	0.64	0.60	0.56
Market capitalization	NA	45984	15045	12420	34218

Data collected: Acquired Company: IPCL

IPCL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	249.05	249.05	249.05	249.05	249.05
Reserves &Surpluses	2783.50	2946.13	2578.24	2036.07	2023.07
Net Worth	3032.55	3195.18	2827.29	2285.12	2272.12
Loan Funds :					
Secured Loans	1448.56	994.09	1984.84	1720.13	1190.03
Unsecured Loans	3297.82	3281.67	1731.45	1607.13	976.02
Total Debt	4746.38	4275.76	3716.29	3327.26	2166.05
Total Capital Employed	7778.93	7470.94	6543.58	5612.38	4438.17
Total Assets	7778.93	7470.94	6732.00	7087.51	5933.31
Income :					
Net sales/Turnover	4060.04	5005.97	4739.9	5028.99	8097.82
Total income	3991.61	5025.00	4793.08	5411.43	8069.52
Expenditure : **Cost of Production/sales**	3015.52	3845.30	4039.01	4325.48	6962.13
PBDIT(Profit Before Depreciation Interest & Tax)	976.09	1179.70	754.07	1085.95	1107.39
Depreciation	316.57	416.71	185.03	454.34	471.59
PBIT	659.52	762.99	569.04	631.61	635.80
Interest	387.55	490.95	373.67	368.97	299.24
PBT(Profit Before Tax)	271.97	272.04	195.37	262.64	336.56
Taxes	83.12	23.13	87.90	58.47	63.0
PAT (Profit After Tax)	188.85	248.91	107.47	204.17	273.56
Dividends	49.65	74.47	49.65	55.85	62.05
EPS	7.61	10.00	4.33	8.23	11.02
GPM	24.04	23.57	15.91	21.6	13.7
NPM	4.65	5.0	2.27	4.1	3.4
ROCE	8.5	10.22	8.7	11.25	14.33
D/E	1.56	1.34	1.31	1.46	0.95
Market capitalization	NA	NA	515	1785	2478

Data analysis of Acquirer Company RIL:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	2000-01	2001-02	**2002-03**	2003-04
GPM %	21.9	20.6	20.4	21.2
NPM %	10.40	7.7	8.9	10.0
ROCE %	16.0	12.6	13.0	14.0

COP/ SALES	89.8	117	87.1	79.8

Step 2: Financial Synergy:

Parameter	2000-01	2001-02	**2002-03**	2003-04
OCF	4211	6059	6941	8407
D/E	0.69	0.64	0.60	0.56

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	2000-01	**2001-02**	2002-03	2003-04
Sales	17850	25429	42122	45898	51802
PAT	2403	2646	3243	4104	5160
Assets	25209	24901	46399	50133	55397
Net worth	13689	14765	27470	30374	34453
NPM %	13.5	10.4	7.7	8.9	10.0
ATO %	71	102	91	92	94
EQM %	184	168	169	165	94
ROE %	17.6	17.8	11.8	13.5	15.13
EPS (Rs.)	22.47	25.10	23.40	29.55	36.79

Average ROE (Pre-Acquisition)   =   17.7 %

Average ROE (Post Acquisition)   =   13.5

Average EPS (Post Acquisition)   =   23.8

Average EPS (Post Acquisition)   =   29.8

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	2000-01	**2001-02**	2002-03	2003-04

MV	45984	15045	12420	34218
MV growth	NA	(-30939)	(-2625)	21798
Dividends	448	663	698	733
Cost Of Equity %	12	12	11.5	11
Required Return	NA	5518	1845	1428
Addition To equity	0.0	1.0	342	0.0
WAI	NA	(-35795)	(-4114)	21103

Cumulative WAI   (Post-Acquisition)   =   (-18806)

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	2000-01	**2001-02**	2002-03	2003-04
PBIT	3997	5842	6529	7736
Interest	1211	1407	1555	1435
PBT	2786	4435	4974	6301
Tax	140	1192	870	1141
PAT	2646	3243	4104	5106
Net Worth	14765	27470	3375	34452
Debt	10136	18929	19758	20945
Capital	24901	46399	50133	55397
Effective tax Rate %	5	26.9	17.5	18.1
Nopat	3857	4650	5659	6595
Post Tax kd	12.6	10.2	9.5	8.4
Cost of Equity ke	12	12	11.5	11
K=WACC	12.25	11.26	10.71	10.02
EVA	807	(-575)	291	1041
Δ EVA	NA	(-1382)	866	750

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in (2000-01) year just before the takeover = 45984

COV	=	31489
Expected FGV	=	14495
Actual FGV Achieved	=	(-284)
Difference	=	(-14779)

Data analysis of Acquired Company IPCL:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	2001-02	**2002-03**	2003-04
GPM %	15.90	21.6	13.7
NPM %	2.2	4.1	3.4
ROCE %	8.7	11.25	14.33
COP/ SALES	85.2	86.0	86.0

Step 2: Financial Synergy:

Parameter	2001-02	**2002-03**	2003-04
OCF	292.5	658.5	745.2
D/E	1.31	1.46	0.95

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	2000-01	2001-02	**2002-03**	2003-04
Sales	4060.0	5006.0	4740.0	5029.0	8098.0
PAT	188.85	248.91	107.47	204.17	273.56
Assets	7778.93	7470.94	6732.00	7087.51	5933.31
Net worth	3032.55	3195.18	2827.29	2285.12	2272.12
NPM %	4.65	5.0	2.27	4.1	3.4
ATO %	52.2	67.0	70.4	70.95	136

EQM %	256	234	238	311	261
ROE %	6.21	7.84	3.80	9.05	12.07
EPS (Rs.)	7.61	10.00	4.33	8.23	11.02

Average ROE (Pre-Acquisition)   =   5.95 %

Average ROE (Post Acquisition)   =   10.56 %

Average EPS (Post Acquisition)   =   7.31

Average EPS (Post Acquisition)   =   9.63

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	2001-02	**2002-03**	2003-04
MV	515	1785	2478
MV growth	NA	1270	693
Dividends	49.65	55.85	62.05
Cost Of Equity %	12	11.5	11
Required Return	NA	62	205
Addition To equity	0.0	0.0	0.0
WAI	NA	1264	550

Cumulative WAI (Post Acquisition)   = 1814

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	2001-02	**2002-03**	2003-04
PBIT	569.04	631.61	635.80
Interest	373.67	368.97	299.24
PBT	195.37	262.64	336.56
Tax	87.90	58.47	63.0
PAT	107.47	204.17	273.56
Net Worth	2827.29	2285.12	2272.12

Debt	3716.29	3327.26	2166.05
Capital	6543.58	5612.38	4438.17
Effective tax Rate %	45	22.3	18.7
Nopat	481.14	573.14	572.8
Post Tax kd	18.3	14.3	17
Cost of Equity ke	12	11.5	11
K=WACC	15.57	13.16	13.93
EVA	(-538)	(-166)	(-45)
Δ EVA	NA	372	121

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in (2001-02) year just before the takeover   =   515

COV   =   3089

Expected FGV   =   (-2574)

Actual FGV Achieved   =   3132

Difference   =   5706

The summary of data analysis is brought out below:

Table-5.3: Average of data analysis Parameters Pre and Post M&A Years

Operational Synergy								
Companies	**GPM**		**NPM**		**ROCE**		**COP/Sales Ratio**	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
RIL	21.25	20.8	8.87	9.45	14.3	13.5	103.4	83.45
IPCL	15.9	17.65	2.2	3.75	8.7	12.79	85.2	86

Financial Synergy				
	OCF		**DE Ratio**	
	Pre	Post	Pre	Post
RIL	5135	7674	0.66	0.58
IPCL	292.5	701.85	1.31	1.2

Shareholder's Return & Shareholder's Wealth Creation Analysis					
	WAI		**EVA**		**FGV**
	Pre	Post	Pre	Post	Expected	Actual
RIL	-17897.5	12608.5	116	808	14495	-284

| IPCL | 1264 | 907 | -538 | 105.5 | -2574 | 5706 |

5.5.3 Observations of Data Analysis:

Driving forces and motives of acquisition: Reliance's acquisition of IPCL is in line with the international trend of industry consolidation to enable to enhance scale, integration and financial strength to pursue future growth opportunities.

After the takeover, taking into account the range of products the combined entity RIL-IPCL combine controls, more than two thirds of the production capacity of the petrochemicals business in India. The RIL-IPCL virtual monopoly will have greater pricing power in the domestic market.

Another important factor of this acquisition is that, RIL's take-over of IPCL ensures that it has denied space to competition. By acquiring IPCL, Reliance has effectively denied IOCL the opportunity to move downstream and gain a footing in the petrochemical industry. Further, as in the case of RIL-RPL merger RIL is looking for cost efficiencies acquisition also. Now RIL will supply the feed stock to IPCL instead of IOCL saving on the costs.

The Data Analysis from the Target Company's point of view gives mixed results. As far as the operational synergy is concerned there is decrease in the profit margins post acquisition. However ROCE has improved. The figures indicate an improvement in the financial synergy as revealed by an increase in OCF. The risk has also came down because of the association with RIL. Both the deviation and volatility of earnings have come down. This indicates a better financial management.

The shareholders of IPCL got better returns in the years after acquisition. The average ROE almost doubled post acquisition when compared to pre-acquisition period. Similarly there was positive accumulation of shareholder's wealth post acquisition as revealed by WAI and EVA analysis.

5.6 Case-4: Acquisition of Kochi Refineries Ltd. (KRL) by Bharat Petroleum Corporation Ltd. (BPCL):

5.6.1 Deal Snapshot :

Acquirer Company: BPCL is a PSU with a refinery of 9 million tons per annum at Mumbai. It is in the business of oil refining and marketing petroleum products. It has an overall market share of 20 %. BPCL has a well spread marketing infrastructure of more than 4500 retail outlets.

Acquired or Target Company: KRL is a standalone refinery without any marketing infrastructure of its own. It has got a single refinery in Kochi in Kerala with refining capacity of 7.5 million tons per annum. KRL recorded a turnover of Rs. 9858 crores and a profit of Rs. 910 crores in 2003-04.

The Deal: This takeover was the results of the recommendations of the Sengupta committee, set up by the Govt. of India to study the viability of standalone oil refineries in a decontrolled post APM scenario. The committee recommended the merger of standalone refineries with one of the marketing companies like IOCL, BPCL or HPCL .Govt. of India proposed to BPCL to takeover KRL. BPCL paid Rs. 659 crores to Govt. of India for the acquisition of about 7.59 crore shares of KRL at a price of Rs. 86.85 per share.

5.6.2 Data Analysis:

Based upon data analysis methodology brought out at para 5.2 above, data analysis for this case has been carried out as below:

Data collected: Acquirer Company: BPCL

BPCL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	150.0	300.0	300.0	300.0	300.0
Reserves &Surpluses	3344.70	3779.40	3697.40	4447.43	5549.72
Net Worth	3494.70	4079.40	3997.40	4747.43	5849.72
Loan Funds :					
Secured Loans	1512.80	2478.71	2242.32	2442.53	1973.74
Unsecured Loans	1079.87	1679.43	1606.42	843.33	715.98
Total Debt	2592.67	4158.14	3848.74	3285.86	2689.72
Total Capital Employed	6087.37	8237.54	7846.14	8033.23	8539.44
Total Assets	6087.40	8237.5	8545.0	8779.80	9361.80
Income :					
Net sales/Turnover	33384.70	45932.10	39829.5	43569.46	48254.31
Total income	34866.70	48935.1	42483.5	45382.68	48437.12
Expenditure :					
Cost of Production/sales	33129.0	46901.9	40369.1	42662.27	45135.48
PBDIT(Profit Before Depreciation Interest & Tax)	1737.7	2033.2	2114.4	2720.41	3301.64
Depreciation	615.4	664.5	481.0	480.92	561.16
PBIT	1122.30	1368.70	1633.40	2239.48	2740.49
Interest	185.4	255.60	306.6	245.95	104.97
PBT(Profit Before Tax)	936.9	1113.10	1326.8	1993.54	2635.52
Taxes	235.2	280.40	477.0	743.51	940.95
PAT (Profit After Tax**)**	701.7	832.70	849.8	1250.03	1694.57
Dividends	187.5	225.0	330.0	450.0	525.0
EPS	23.29	27.76	28.33	41.67	56.49
GPM	5.20	4.43	5.30	6.24	6.84
NPM	2.10	1.81	2.10	2.90	3.5
ROCE	18.40	16.6	20.8	27.90	32.1
D/E	0.70	1.02	0.96	0.69	0.46
Market capitalization	993	971	1691	4843	4044

Data collected: Acquired Company: KRL

KRL	1999-00	2000-01	2001-02	2002-03	2003-04

Shareholder's funds :					
Equity share capital	68.94	138.47	138.47	138.47	138.47
Reserves &Surpluses	1209.73	1223.46	999.43	1299.24	1666.87
Net Worth	1278.67	1361.93	1137.90	1437.71	1805.34
Loan Funds :					
Secured Loans	62.73	17.75	68.02	81.39	60.91
Unsecured Loans	744.66	864.21	845.17	936.17	519.52
Total Debt	807.39	881.97	913.19	1017.56	580.43
Total Capital Employed	2086.06	2243.90	2051.09	2455.26	2385.77
Total Assets	2086.06	2243.90	2051.09	2455.26	2385.77
Income :					
Net sales/Turnover	5768.33	7135.75	5812.74	10489.50	9858.30
Total income	5868.63	7246.15	5839.92	10523.70	9857.31
Expenditure :					
Cost of Production/sales	5484.22	6932.21	5495.44	9616.90	8793.54
PBDIT(Profit Before Depreciation Interest & Tax)	384.41	313.84	344.48	906.80	1063.77
Depreciation	62.72	101.46	110.54	115.40	114.24
PBIT	321.70	212.39	233.94	791.40	949.53
Interest	38.78	109.93	114.79	94.90	39.77
PBT(Profit Before Tax)	282.92	102.46	119.15	696.50	909.76
Taxes	48.50	8.50	31.00	240.50	354.70
PAT (Profit After Tax**)**	235.21	109.46	87.58	456.00	555.09
Dividends	129.90	31.98	30.53	138.47	166.16
EPS	NA	NA	NA	32.93	40.09
GPM	9.5	4.4	5.9	8.6	10.8
NPM	4.1	1.5	1.5	4.3	5.6
ROCE	15.4	9.5	11.4	32.3	39.8
D/E	0.63	0.65	0.80	0.71	0.32
Market capitalization	NA	NA	NA	NA	NA

Data analysis of Acquirer Company BPCL:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
GPM %	5.2	4.43	5.3	6.24	6.84
NPM %	2.10	1.81	2.10	2.90	3.5
ROCE %	18.4	16.6	20.8	27.9	32.1
COP/ SALES	99.2	102	101	97.9	93.5

Step 2: Financial Synergy:

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
OCF	1371.1	1497.2	1330.8	1730.8	1799.5
D/E	0.70	1.02	0.96	0.69	0.46

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE & EPS:

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
Sales	33385	45932	39830	43570	48254
PAT	702	83	850	1250	1695
Assets	6087	8238	8545	8780	9362
Net worth	3495	4079	3997	4747	5850
NPM %	2.10	1.81	2.10	2.90	3.50
ATO %	549	558	466	496	515
EQM %	174	202	214	185	160
ROE %	20.06	20.40	20.90	26.60	28.84
EPS (Rs.)	23.39	27.76	28.33	41.67	56.49

Average ROE (Pre-Acquisition)   =   20.06 %

Average ROE (Post Acquisition)   =   24.20 %

Average EPS (Post Acquisition)   =   23.39

Average EPS (Post Acquisition)   =   38.56

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
MV	993	971	1691	4843	4044
MV growth	NA	(-22)	720	3152	(-799)

Dividends	188	225	330	450	525
Cost Of Equity %	12.5	12	12	11.5	11
Required Return	NA	142	117	203	557
Addition To equity	0.0	150	0.0	0.0	0.0
WAI	NA	(-89)	933	3399	(-831)

Cumulative WAI   (Post Acquisition)   = +3412

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
PBIT	1122.3	1368.7	1633.4	2239.5	2740.5
Interest	185.4	255.6	306.6	245.9	104.9
PBT	936.9	1113.1	1326.8	1993.5	2635.5
Tax	235.2	280.4	477.0	743.5	940.95
PAT	701.7	832.7	849.8	1250.0	1694.57
Net Worth	3494.7	4079.4	3997.4	4747.4	5849.7
Debt	2592.7	4158.1	3848.7	3285.9	2689.7
Capital	6087.4	8237.5	7846.1	8033.3	8539.4
Effective tax Rate %	25	25.2	35.9	37.3	35.7
Nopat	887	1089	1157	1496	1800
Post Tax kd	9.5	8.2	11.6	11.9	6.1
Cost of Equity ke	12.5	12	12	11.5	11
K=WACC	11.23	10.1	11.8	11.7	9.5
EVA	205	257	231	556	989

Δ EVA	NA	52	(-26)	325	433

Step 6: Addition To Share Holder's Wealth: Future Growth Value (FGV):

MV in (1999-00) year just before the takeover   =   993

COV =   7912

Expected FGV   =   (-6919)

Actual FGV Achieved   =   5547

Difference   =   + 12466

Data analysis of Acquired Company KRL:

Operational & Financial Synergy:

Step 1: Operational Synergy:

Parameter	1999-00	**2000-01**	2001-02	2002-03	
GPM %	9.5	4.4	5.9	8.6	10.8
NPM %	4.1	1.5	1.5	4.3	5.6
ROCE %	15.4	9.5	11.4	32.3	39.8
COP/ SALES	95.	97.1	94.5	91.7	89.2

Step 2: Financial Synergy:

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
OCF	297.9	210.9	198.1	571.4	669.3
D/E	0.63	0.65	0.80	0.71	0.32

Addition to Share Holder's Return & Wealth:

Step 3: Addition to Share Holder's Return: ROE:

Parameter	1999-00	**2000-01**	2001-02	2002-03	2003-04
Sales	5768	7134	5813	10490	9858

PAT	235	110	88	456	555
Assets	2086	2244	2051	2455	2386
Net worth	1279	1362	1138	1438	1805
NPM %	4.1	1.5	1.5	4.3	5.6
ATO %	277	318	283	427	413
EQM %	163	165	180	171	132
ROE %	18.5	7.9	7.6	31.4	30.5

ROE (Pre-Acquisition) =   18.5 %

Average ROE (Post Acquisition)   =   19.35 %

Step 4: Addition to Share Holder's Wealth: Wealth Added Index (WAI):

WAI could not be calculated due to the non-availability of market capitalization data.

Step 5: Addition To Share Holder's Wealth: Economic Value Added (EVA):

Parameter	1999-00	**2000-01**	2001-02	23002-03	2003-04
PBIT	321.7	212.4	233.9	791.4	949.5
Interest	38.8	109.9	114.8	94.9	39.8
PBT	282.9	102.5	119.2	696.5	909.8
Tax	48.5	8.5	31.0	240.5	354.7
PAT	235.2	109.5	87.6	456.0	555.1
Net Worth	1278.7	1361.6	1137.9	1437.7	1805.3
Debt	807.4	882.0	913.2	1017.6	580.4
Capital	2086.0	2243.6	2051.1	2455.3	235.8
Effective tax Rate %	17.3	8.3	26.05	34.6	3.0
Nopat	274	20	203	551	95
Post Tax kd	5.85	13.6	17.04	14.3	11.3

Cost of Equity ke	12.5	12	12	11.5	11
K=WACC	9.92	12.63	14.25	12.67	11.1
EVA	67	(-64)	(-89)	239	330
Δ EVA	Na	(-131)	(-25)	328	91

$\sum$ of all Δ EVA s = + 154

The summary of data analysis is brought out below:

Table-5.4: Average of data analysis Parameters Pre and Post M&A Years

Company	Operational Synergy							
	GPM		**NPM**		**ROCE**		**COP/Sales Ratio**	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
BPCL	5.2	5.7	2.1	2.57	18.4	24.35	99.2	98.6
	Financial Synergy							
	OCF				**DE Ratio**			
	Pre		Post		Pre		Post	
BPCL	1371.1		1589.57		0.7		0.78	
	Shareholder's Return & Shareholder's Wealth Creation Analysis							
	WAI		**EVA**		**FGV**			
	Pre	Post	Pre	Post	Pre		Post	
BPCL	-89	853	205	508.25	-6919		12466	

5.6.3 Observations of Data Analysis:

Motives and driving forces for acquisition: The acquisition of KRL by BPCL was an arranged marriage brokered by the Govt. of India. However there was some interest on the part of the BPCL management to acquire KRL.

BPCL does not have a refinery in southern India and in the southern region BPCL has got a sales volume of 6 million tons which can be met from KRL. For long the company's growth had been handicapped by inadequate refining capacity .this deal at a stroke doubled BPCL's refining capacity. Thus acquisition of KRL would enable BPCL balance its sales and production volumes and strengthen its competitive

position under a deregulated market. BPCL has already created a modern marketing terminal at Kochi, the site of KRL refinery. BPCL will have increased economies of scale of production, better distribution and increased sales and volume.

The Data Analysis from the Acquirer Company's point of view shows that BPCL was able to achieve operational and financial synergies after acquiring KRL. This is revealed by the fact that all the indicators have shown an increasing trend post acquisition and crossed the levels of pre-acquisition period. Similarly the shareholders of BPCL also benefited from the acquisition of KRL. The average ROE has improved from 20.06 % to 24.2 % post acquisition. Shareholder's wealth has also been improved.

The Data Analysis from the acquired or Target Company's point of view shows that the operational performance of KRL did not significantly improve post acquisition. Both GPM and NPM were lowest during the year of acquisition and only reached the level of pre-acquisition period in the latest year (2003-04) for which data is available. However ROCE has improved significantly and some operational synergy is indicated by the continuous decrease in COP / Sales figures in the post-acquisition years.

Shareholder's returns (ROE) decreased substantially immediately after the acquisition. However this has been overshadowed by the large increase in the last two years and average ROE post acquisition shows a marginal improvement.

WAI analysis could not be done because of the non-availability of market cap data. However EVA analysis shows a positive cumulative EVA for the post acquisition

period indicating improvement in shareholder's wealth in the long run. The case analysis reveals that BPCL's acquisition pf KRL can be considered as a winning case.

6. Hypothesis of the Study:

Two hypotheses has been formulated for the present study, null hypothesis and alternate hypothesis. Paired "t" test has been applied as statistical tool to test the hypotheses. Accordingly the following null and alternate hypotheses have been tested:

A. H0 Null Hypothesis

(i) **H0:-** M&A do not result significant difference between Pre and Post merger Operational Synergy Parameters of the companies in Indian Petroleum Industry.

(ii) **H0:-** M&A do not result significant difference between Pre and Post merger Financial Synergy Parameters of the companies in Indian Petroleum Industry.

(iii) **H0:-** M&A do not result significant difference between Pre and Post merger shareholder's return and share-holder's wealth parameters of the companies in Indian Petroleum Industry.

B. H1 Alternate Hypothesis

(i) **H1: -** M&A result significant difference between Pre and Post merger Operational Synergy Parameters of the companies in Indian Petroleum Industry.

(ii) **H1: -** M&A result significant difference between Pre and Post merger Financial Synergy Parameters of the companies in Indian Petroleum Industry

(iii) **H1: -** M&A result significant difference between Pre and Post merger shareholder's return and shareholder's wealth parameters of the companies in Indian Petroleum Industry.

7. Key findings and observations:

The paired t-test is also applied to test the significance of the formulated statistical hypotheses to offer findings and implications of this research study as brought out below:

7.1 Operational Synergy Pre and Post M&A:

Comparative mean pre-merger and post-merger Operational Synergy Parameters and results from t-tests for statistical significance have been summarized in Table-7.1.

Table-7.1

Mean pre-merger and post-merger Operational Synergy Parameters

Operational Synergy Parameters	Pre-merger	Post-merger	t (0.05 significance)	t-critical (two tail)
Gross Profit Margin (GPM)	16.84	18.2	2.156	2.447
Net Profit Margin (NPM)	4.92	7.25	2.148	2.447
Return on Capital Employed (ROCE)	14.97	24.43	2.302	2.447
COP-Sales Ratio	90.26	85.50	-1.810	2.447

The comparison of the pre-merger and post-merger Operational Synergy Parameters for the sample set of M&A showed that there was a slight decline in the cost savings as reflected in the Cost of Production to Sales ratio (COP/ Sales) pre and post deal (90.26 % to 85.50%) from the pre-merger period to the post-merger period. The declines are however, not statistically significant (t-statistic values of -1.810 is less than t-critical value of 2.447). However, there was a marginal increase in other Operational Synergy Parameters like GPM, NPM and ROCE which were also found statistically insignificant as indicated by t-value (t-statistic values is less than t-critical value).

Based on the above results, the Null Hypothesis H0: "M&A do not result significant difference between Pre and Post merger Operational Synergy Parameters of the companies in Indian Petroleum Industry" cannot be rejected.

7.2 Financial Synergy Pre and Post M&A:

Comparative mean pre-merger and post-merger Financial Synergy Parameters and results from tests for statistical significance have been summarized in Table-7.2.

Table-7.2

Mean pre-merger and post-merger Financial Synergy Parameters

Financial Synergy Parameters	Pre-merger	Post-merger	t (0.05 significance)	t-critical (two tail)
Operating Cash Flows (OCF)	3004.77	4731.21	2.341	2.447
Debt –Equity ratio (D/E)	2.51	1.12	-1.244	2.447

The comparison of the pre-merger and post-merger Financial Synergy Parameters for the sample set of M&A showed a marginal increase in the OCF (3004.77 to 4731.21). But the increases are not statistically significant, as indicated by the corresponding t-value of 2.341.

However, there seemed to be a marginal leverage effect, as seen from the debt-equity ratios before and after the mergers (1.12 vs. 2.51), but not statistically significant, as indicated by the t-value of -1.244.

Based on the above results, the Null Hypothesis H0: "M&A do not result significant difference between Pre and Post merger Financial Synergy Parameters of the companies in Indian Petroleum Industry" cannot be rejected.

7.3 Shareholder's return and shareholder's wealth Pre and Post M&A:

Comparative mean pre-merger and post-merger Shareholder's return and shareholder's wealth Parameters and results from tests for statistical significance have been summarized in Table-7.3.

Table-7.3

Mean pre-merger and post-merger Shareholder's return and shareholder's wealth Parameters

Shareholder's return and shareholder's wealth Parameters	Pre-merger	Post-merger	t (0.05 significance)	t-critical (two tail)
Wealth Added Index (WAI)	-1570.93	4740.95	1.512	2.447
Economic Value Added (EVA)	335.57	1831.23	1.882	2.447
Future Growth Value (FGV)	-13373.7	24300	1.734	2.447

The comparison of the pre-merger and post-merger Shareholder's return and shareholder's wealth Parameters for the sample set of M&A showed a significant increase in the WAI, EVA as well as FGV but the increases are not statistically significant, as indicated by the corresponding low t-values of 1.512, 1.882 and 1.734 respectively in comparison to t-critical value of 2.447.

Based on the above results, the Null Hypothesis H0: "M&A do not result significant difference between Pre and Post merger shareholder's return and share-holder's wealth parameters of the companies in Indian Petroleum Industry" cannot be rejected.

8.1 Conclusions:

The analysis of the selected cases bring out the following conclusions:

(i) There are two winning cases (IOCL+IBP), (BPCL+ KRL). The remaining two cases showed mixed results. However, a comprehensive reading of all the cases together brings out a common underlying theme in all these cases. These M&As are the strategic responses of these companies to the changes in the economic environment brought about by the policy changes introduced by the Govt. of India in recent times. The behavior of these firms is similar to the behavior of other companies in different sectors in Indian economy and in line with the international trends.

(ii) In general, the driving forces and motives which pushed these companies for the M&A deals are: enlarging their scale of operations into global levels, desire to realize the economies of scale and cost efficiencies, improve the market share etc. All the M&A deals studied here are the results of the effort of these companies for integration, both forward as well as backward. Now a days petroleum companies world over aim to be present in every stage of the value addition of hydrocarbon business. It is observed that , even though strategic motives drive most M&A deals, they are not always achieved .Even in cases where synergies are realized to a good extent they do not necessarily translate into improved shareholder's return and wealth.

(iii) In this context, a pre-merger due diligence study taking into consideration technical, financial, legal and cultural aspects is very important to accurately assess the possible synergies as well as the risks involved.

(iv) Traditional accounting methods does not provide the full picture and are inadequate to analyze the impact of M&A deals on the performance of the companies. New tools like WAI, EVA and FGV analysis are more adequate for this purpose.

(v) It is also observed that corporate restructuring decisions being strategic in nature, timing and speed of implementation are very important for achieving the possible synergies.

(vi) Results of paired "t" test shows that statistically there is no significant difference between the operational synergy, financial synergy, shareholder's return and shareholder's wealth parameters of the Pre and Post merger and acquisition of companies in Indian Petroleum Industry whereas individually data analysis of all 4 deals considered here show different results. Hence it can inferred that post M&A performance in Indian Petroleum Industry cannot be generalized and requires data analysis on case to case basis of each M&A deal.

(vii) Scope for improvement of the study and research in allied fields: This study focused mainly on the operational & financial synergies of the M&A deals and the shareholder's returns thereafter. However the subject matter of mergers and acquisitions is wide and new issues are emerging. Large scale corporate restructuring in India is a recent phenomenon and there are several specific to Indian context. Some of the issues on which future researchers on this field can concentrate are listed below

(viii) Comparison of company's performance versus industry performance after the M&A deal to know whether the company has outperformed the industry.

(ix) Evaluation of the pricing of the deal for the justification about the amount of premium paid by the acquirer for the shares of the target company in relation to the prevailing market prices of the share and the percentage of the stake acquired.

(x) The quality and the adequacy of disclosures in the financial statements arising from corporate restructuring is another vital issue connected with corporate governance.

(xi) There are finer issues of integration of business systems & technologies and cultures of the two entities which have come together because of M&A deal and the impact of these deals on the employee morale and behavior.

8.2 Managerial Implications:

Mergers and Acquisitions revolve around synergy where two entities come together and pool in their expertise and resources to perform better.

Primarily, estimating synergies and its effect is an important decision in the M&A process for four reasons.

a) M&A are meant for value creation and hence assessing the value that would be created by the synergies is important

b) Assessing how investors would react to the merger deal is another important consideration.

c) Managers need to disclose the strategies and benefits of M&A deals to investors and hence their perfect estimation and knowledge is important.

d) Valuing synergies is important for developing post-merger integration strategies.

However important valuing synergies may be, practically very few companies actually develop a transactional team, draw up a joint statement regarding the objectives of the deal or solve the post-closing operating and financial problems timely. Synergies can be further discussed as being financial, operating or managerial synergies.

Operational synergies refer to those classes of resources that lead to production and/or administrative efficiencies. Product related diversification mergers are often carried out keeping operational synergies in mind. These synergies help firms bring down unit costs due to product relatedness. Common technology, marketing techniques like common brand and manufacturing facilities like common logistics are essentially the components of operational synergy.

Operational synergy can be explained as a combination of economies of scale, which would reduce average costs as a result of more efficient use of resources and economies of scope, which would help a company deliver more from the same amount of inputs.

Financial synergy refers to the impact of mergers and acquisitions on lowering the cost of capital of the merged or newly formed entity. Financial synergies lead to reduced cost of capital and / or increased borrowing power. Conglomerate mergers generally focus on financial synergies that increase the competitiveness for each

individual unit controlled by one centralized parent company beyond what could have been achieved by each unit competing individually. Along with a lower cost of capital, financial synergies also bring about a larger capital base which helps funding of larger investments. In case of conglomerate mergers, financial diversification can bring about various other advantages like more stable cash flows, lower performance variations, insurance gains and other tax advantages. Financial synergies are possible between related and unrelated firms unlike operational synergies that take place only between related firms.

Managerial synergy is the increased efficiency as a result of integration of management teams of two firms coming together. Often management teams have different strengths and their coming together could result in improved managerial expertise. These synergies occur when competitively relevant skills possessed by managers of previously independent companies can be successfully transferred to the merged or acquired entity

9. Limitations of This Study:

Size of the samples considered is one of the limitations of the study. Examining few companies which have undergone M&A on the basis of petroleum sector considered here may not prove worthy for other sector firms.

This study analyses impact evaluation of M&A decision immediately after announcement which also captures stock market reactions. The pre and post-merger evaluation analyses the acquired company performance also along with Acquirer Company till the actual integration occurs in 2-3 years after which acquired company merged to the acquired company. Hence data as separate companies are not available.

Taking more years data in research analysis has the risk of other factors affecting their performance due to other organic / inorganic expansion decisions done later due to which true effect on performance and shareholder's wealth due to M&A decision under this study may not get captured.

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Method of EVA Analysis

Steps in EVA analysis:

(i)   The market value of the company in the year just prior to the Merger or Acquisition being affected is taken as MVo.

(ii)   Then the Current Operations Value COV isn determined. For this purpose Capo (Book capital) is taken as net worth plus interest bearing debt in the year 0 i.e.; in the year prior to the merger or acquisition. Then EVA for the year 0 is determined , capitalized at the weighted average cost of capital of that year and the resulting figure is then added to Capo to get COV

   Therefore $COV = Capo + (EVAo / k)$

(iii)   Then the Future Growth Value FGV of the company, i.e.; expectational component (or the expectations of the investors) is calculated as $FGV = (MVo - Capo)$

(iv) The actual EVA is then calculated for each year post M&A for which data is available. The year to year improvement in EVA (or ΔEVA) are calculated and the Present Value of these improvements is determined using the weighted cost of capital. The present value of EVA improvements is then capitalized to perpetuity by multiplying with a factor of $(1+k) / k$ and this is equal to the Actual FGV achieved post deal.

(v) The last step is to compare the Actual FGV obtained in step (iv) with the expected FGV calculated in step (iii). If the actual FGV is greater than the

expected FGV it can be concluded that the Merger or Acquisition has resulted in an addition to shareholder's wealth.

Definition of the terms used:

Post tax cost of debt k_d = Interest / debt (1-t)

Weighted Average Cost of Capital = k_d * (debt / capital) + k_e * (net worth / capital)

k_e = Cost of equity (ke has been arrived at similar to WAI computations)

Actual FGV = $(1+k) / k * \sum [(\Delta EVA / (1+k/100)^t]$

DATA SHEET: IOCL

IOCL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	778.7	778.7	778.7	778.7	1168.0
Reserves &Surpluses	13286.1	15192.3	14532.4	18149.3	21879.4
Net Worth	14064.8	15971.0	15311.1	18928.0	23047.4
Loan Funds :					
Secured Loans	3850.6	4713.3	4617.0	4701.1	3175.2
Unsecured Loans	10866.8	15922.5	14453.0	9794.0	9003.4
Total Debt	14717.4	20635.8	19070.0	14495.1	12178.6
Total Capital Employed	28782.2	36606.8	34381.1	33423.1	35226.0
Total Assets	28782.0	36607.0	37786.0	37296.0	39509.
Income :					
Net sales/Turnover	94141.0	117371.0	114864.0	105036.6	113698.4
Total income	95824.0	122433.8	115716.50	112977.3	119175.3
Expenditure :					
Cost of Production/sales	89853.0	116573.8	108193.1	102144.5	107157.5
PBDIT(Profit Before Depreciation Interest & Tax)	5971.0	5860.0	7523.4	10832.8	12017.8
Depreciation	1994.6	1223.4	1379.6	1656.3	1873.8
PBIT	3976.4	4636.6	6143.8	9176.5	10144.0
Interest	1006.0	1674.0	1544.4	762.5	452.7
PBT(Profit Before Tax)	2970.4	2962.6	4599.4	8414.0	9691.3
Taxes	527.2	242.3	1714.7	2299.1	2686.4
PAT (Profit After Tax)	2443.4	2720.3	2884.7	6114.9	7004.8
Dividends	584.0	739.7	856.5	2258.2	2452.8
EPS	20.92	23.29	24.70	52.35	59.97
GPM	6.3	5.0	6.6	10.3	10.6
NPM	2.6	2.32	2.5	5.8	6.2
ROCE	13.8	12.7	17.9	27.5	28.8
D/E	1.05	1.29	1.25	0.76	0.53
Market capitalization	NA	108.1	60.2	264.6	3164.5

DATA SHEET: IBP

IBP	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	22.15	22.15	22.15	22.15	22.15
Reserves &Surpluses	317.1	346.94	423.88	476.71	603.86
Net Worth	339.25	369.09	446.03	498.86	626.01
Loan Funds :					
Secured Loans	41.85	68.99	0.00	0.00	0.00
Unsecured Loans	580.02	371.89	0.00	0.00	0.00
Total Debt	621.87	440.88	0.00	0.00	0.00
Total Capital Employed	961.12	809.97	446.03	498.86	626.01
Total Assets	961.12	809.97	510.41	575.06	709.57
Income :					
Net sales/Turnover	6322.5	8079.7	8039.23	8358.8	10148.19
Total income	6360.2	8362.13	8045.17	8723.3	10233.01
Expenditure : **Cost of Production/sales**	6210.0	8171.3	7690.81	8537.6	9858.47
PBDIT(Profit Before Depreciation Interest & Tax)	150.1	190.8	354.36	185.7	374.54
Depreciation	22.1	40.95	34.87	44.4	41.27
PBIT	128.0	149.84	319.5	141.3	333.3
Interest	81.0	88.62	29.54	0.5	0.68
PBT(Profit Before Tax)	47.0	61.22	289.95	140.8	332.6
Taxes	6.0	7.0	94.16	52.99	117.94
PAT (Profit After Tax)	41.7	54.22	195.79	87.81	214.6
Dividends	10.2	24.41	22.15	31.0	77.52
EPS	18.83	24.48	42.82	39.62	96.92
GPM	2.4	2.4	4.4	2.2	3.7
NPM	0.66	0.70	2.4	1.05	2.1
ROCE	13.3	18.5	71.6	28.3	53.2
D/E	1.83	1.19	0.0	0.00	0.00
Market capitalization	NA	34.9	92.8	199.2	489.8

DATA SHEET: ONGC Ltd.

ONGC Ltd.	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	1425.93	1425.93	1425.93	1425.93	1425.93
Reserves &Surpluses	25384.32	28885.36	28296.25	34313.03	39117.17
Net Worth	26810.25	30311.29	29722.18	35738.96	40543.09
Loan Funds :					
Secured Loans	368.13	208.5	0.00	0.00	0.00
Unsecured Loans	6727.14	4271.24	3510.84	800.23	3378.59
Total Debt	7095.27	4479.74	3510.84	800.23	3378.59
Total Capital Employed	33905.52	34791.02	33233.02	36539.19	43921.68
Total Assets	34005.20	34791.02	3858.08	41774.03	57792.94
Income :					
Net sales/Turnover	19992.03	23179.10	22528.42	34229.53	32076.01
Total income	20090.64	25215.98	24558.70	36288.27	33597.32
Expenditure : **Cost of Production/sales**	9278.17	10476.62	10291.50	13796.15	14215.92
PBDIT(Profit Before Depreciation Interest & Tax)	10812.47	14739.36	14267.20	22492.12	19381.41
Depreciation	4252.3	5059.12	4127.23	6262.34	5695.04
PBIT	6560.17	9680.24	10139.97	16229.78	13117.03
Interest	600.3	523.4	284.74	146.59	47.96
PBT(Profit Before Tax)	5959.87	9156.85	9855.23	16083.19	13609.07
Taxes	2330.4	3928.07	3657.35	5594.52	4944.62
PAT (Profit After Tax)	3629.47	5228.78	6197.88	10529.33	8664.45
Dividends	926.86	1568.53	1996.31	427.80	3422.24
EPS	25.45	36.67	43.47	73.84	60.76
GPM	54.0	63.6	63.3	65.70	60.4
NPM	18.2	22.6	27.5	30.8	27.01
ROCE	19.35	27.8	30.51	44.4	31.1
D/E	0.26	0.15	0.12	0.02	0.28
Market capitalization	NA	NA	145	1802	13321

DATA SHEET: MRPL

MRPL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	792.15	792.53	792.16	1759.60	1752.61
Reserves &Surpluses	173.76	-(11.29)	(-325.69)	(-737.50)	(-278.08)
Net Worth	965.91	780.86	466.47	1022.10	1474.53
Loan Funds :					
Secured Loans	5015.72	4995.03	4990.67	4431.04	1782.09
Unsecured Loans	392.58	56.63	753.45	964.14	3062.21
Total Debt	5408.30	5051.65	5744.12	5395.18	4844.30
Total Capital Employed	6374.21	5832.51	6210.59	6417.29	6318.83
Total Assets	6374.21	5832.51	7009.73	7601.79	6955.15
Income :					
Net sales/Turnover	3216.02	2883.59	5353.91	8058.77	11390.64
Total income	2971.86	2896.15	5505.29	8204.58	11998.67
Expenditure : **Cost of Production/sales**	2846.42	2773.72	5248.56	7916.54	10672.56
PBDIT(Profit Before Depreciation Interest & Tax)	125.44	122.43	256.73	288.04	1326.11
Depreciation	99.57	162.70	363.35	373.74	378.19
PBIT	25.87	(-40.27)	(-106.62)	(-85.70)	947.92
Interest	325.55	237.83	672.29	567.07	373.19
PBT(Profit Before Tax)	(-299.68)	(-278.10)	(-778.91)	(-652.77)	574.50
Taxes	0.024	0.034	0.00	0.00	115.09
PAT (Profit After Tax**)**	(-299.70)	(-278.13)	(-492.48)	(-411.81)	459.41
Dividends	0.00	0.00	0.00	0.00	0.00
EPS	(-3.78)	(-2.34)	(-6.20)	(-5.15)	1.44
GPM	3.9	4.25	4.8	3.57	11.64
NPM	(-9.32)	(-9.65)	(-9.20)	(-5.11)	4.03
ROCE	0.40	(-0.70)	(-1.72)	(-1.34)	15.0
D/E	5.6	6.47	12.31	5.34	3.29
Market capitalization	NA	NA	4.1	19.8	927.20

DATA SHEET: RIL

RIL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	1053.0	1053.0	1054.0	1396.0	1396.0
Reserves &Surpluses	12636.0	13712.0	26416.0	28978.49	33056.50
Net Worth	13689.0	14765.0	27470.0	30374.49	34452.50
Loan Funds :					
Secured Loans	5988.11	4068.4	14189.0	11776.86	11451.14
Unsecured Loans	5532.13	6067.39	4739.6	7981.45	9493.52
Total Debt	11520.24	10135.79	18928.6	19758.31	20944.66
Total Capital Employed	25209.24	24900.79	46398.6	50132.80	55397.16
Total Assets	25209.24	24900.79	46398.60	52817.54	58871.93
Income :					
Net sales/Turnover	17849.9	25429.3	42122.0	45897.79	51801.53
Total income	20988.0	28391.0	57902.0	49334.49	52334.17
Expenditure : **Cost of Production/sales**	16242.0	22829.0	49244.0	39968.03	41351.29
PBDIT(Profit Before Depreciation Interest & Tax)	4746.00	5562.0	8658.0	9366.46	10982.88
Depreciation	1278.0	1565.0	2816.0	2837.09	3247.02
PBIT	3468.0	3997.0	5842.0	6529.37	7735.86
Interest	1003.75	1211.50	1407.0	1555.16	1434.72
PBT(Profit Before Tax)	2464.25	2785.5	4435.0	4974.21	6301.14
Taxes	61.0	139.50	1192.0	869.0	1141.00
PAT (Profit After Tax**)**	2403.25	2646.00	3243.0	4104.31	5160.14
Dividends	384.08	447.85	663.28	698.19	733.10
EPS	22.47	25.10	23.40	29.25	36.79
GPM	26.6	21.9	20.6	20.4	21.2
NPM	13.5	10.4	7.7	8.9	9.96
ROCE	13.8	16.1	12.6	13.02	14.0
D/E	0.82	0.69	0.64	0.60	0.56
Market capitalization	NA	45984	15045	12420	34218

DATA SHEET: IPCL

IPCL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	249.05	249.05	249.05	249.05	249.05
Reserves &Surpluses	2783.50	2946.13	2578.24	2036.07	2023.07
Net Worth	3032.55	3195.18	2827.29	2285.12	2272.12
Loan Funds :					
Secured Loans	1448.56	994.09	1984.84	1720.13	1190.03
Unsecured Loans	3297.82	3281.67	1731.45	1607.13	976.02
Total Debt	4746.38	4275.76	3716.29	3327.26	2166.05
Total Capital Employed	7778.93	7470.94	6543.58	5612.38	4438.17
Total Assets	7778.93	7470.94	6732.00	7087.51	5933.31
Income :					
Net sales/Turnover	4060.04	5005.97	4739.9	5028.99	8097.82
Total income	3991.61	5025.00	4793.08	5411.43	8069.52
Expenditure : **Cost of Production/sales**	3015.52	3845.30	4039.01	4325.48	6962.13
PBDIT(Profit Before Depreciation Interest & Tax)	976.09	1179.70	754.07	1085.95	1107.39
Depreciation	316.57	416.71	185.03	454.34	471.59
PBIT	659.52	762.99	569.04	631.61	635.80
Interest	387.55	490.95	373.67	368.97	299.24
PBT(Profit Before Tax)	271.97	272.04	195.37	262.64	336.56
Taxes	83.12	23.13	87.90	58.47	63.0
PAT (Profit After Tax**)**	188.85	248.91	107.47	204.17	273.56
Dividends	49.65	74.47	49.65	55.85	62.05
EPS	7.61	10.00	4.33	8.23	11.02
GPM	24.04	23.57	15.91	21.6	13.7
NPM	4.65	5.0	2.27	4.1	3.4
ROCE	8.5	10.22	8.7	11.25	14.33
D/E	1.56	1.34	1.31	1.46	0.95
Market capitalization	NA	NA	515	1785	2478

DATA SHEET: BPCL

BPCL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	150.0	300.0	300.0	300.0	300.0
Reserves &Surpluses	3344.70	3779.40	3697.40	4447.43	5549.72
Net Worth	3494.70	4079.40	3997.40	4747.43	5849.72
Loan Funds :					
Secured Loans	1512.80	2478.71	2242.32	2442.53	1973.74
Unsecured Loans	1079.87	1679.43	1606.42	843.33	715.98
Total Debt	2592.67	4158.14	3848.74	3285.86	2689.72
Total Capital Employed	6087.37	8237.54	7846.14	8033.23	8539.44
Total Assets	6087.40	8237.5	8545.0	8779.80	9361.80
Income :					
Net sales/Turnover	33384.70	45932.10	39829.5	43569.46	48254.31
Total income	34866.70	48935.1	42483.5	45382.68	48437.12
Expenditure :					
Cost of Production/sales	33129.0	46901.9	40369.1	42662.27	45135.48
PBDIT(Profit Before Depreciation Interest & Tax)	1737.7	2033.2	2114.4	2720.41	3301.64
Depreciation	615.4	664.5	481.0	480.92	561.16
PBIT	1122.30	1368.70	1633.40	2239.48	2740.49
Interest	185.4	255.60	306.6	245.95	104.97
PBT(Profit Before Tax)	936.9	1113.10	1326.8	1993.54	2635.52
Taxes	235.2	280.40	477.0	743.51	940.95
PAT (Profit After Tax**)**	701.7	832.70	849.8	1250.03	1694.57
Dividends	187.5	225.0	330.0	450.0	525.0
EPS	23.29	27.76	28.33	41.67	56.49
GPM	5.20	4.43	5.30	6.24	6.84
NPM	2.10	1.81	2.10	2.90	3.5
ROCE	18.40	16.6	20.8	27.90	32.1
D/E	0.70	1.02	0.96	0.69	0.46
Market capitalization	993	971	1691	4843	4044

DATA SHEET: KRL

KRL	1999-00	2000-01	2001-02	2002-03	2003-04
Shareholder's funds :					
Equity share capital	68.94	138.47	138.47	138.47	138.47
Reserves &Surpluses	1209.73	1223.46	999.43	1299.24	1666.87
Net Worth	1278.67	1361.93	1137.90	1437.71	1805.34
Loan Funds :					
Secured Loans	62.73	17.75	68.02	81.39	60.91
Unsecured Loans	744.66	864.21	845.17	936.17	519.52
Total Debt	807.39	881.97	913.19	1017.56	580.43
Total Capital Employed	2086.06	2243.90	2051.09	2455.26	2385.77
Total Assets	2086.06	2243.90	2051.09	2455.26	2385.77
Income :					
Net sales/Turnover	5768.33	7135.75	5812.74	10489.50	9858.30
Total income	5868.63	7246.15	5839.92	10523.70	9857.31
Expenditure : **Cost of Production/sales**	5484.22	6932.21	5495.44	9616.90	8793.54
PBDIT(Profit Before Depreciation Interest & Tax)	384.41	313.84	344.48	906.80	1063.77
Depreciation	62.72	101.46	110.54	115.40	114.24
PBIT	321.70	212.39	233.94	791.40	949.53
Interest	38.78	109.93	114.79	94.90	39.77
PBT(Profit Before Tax)	282.92	102.46	119.15	696.50	909.76
Taxes	48.50	8.50	31.00	240.50	354.70
PAT (Profit After Tax**)**	235.21	109.46	87.58	456.00	555.09
Dividends	129.90	31.98	30.53	138.47	166.16
EPS	NA	NA	NA	32.93	40.09
GPM	9.5	4.4	5.9	8.6	10.8
NPM	4.1	1.5	1.5	4.3	5.6
ROCE	15.4	9.5	11.4	32.3	39.8
D/E	0.63	0.65	0.80	0.71	0.32
Market capitalization	NA	NA	NA	NA	NA

Cost of Equity
BSE market rates of returns for the period 2000-2004
Year 2000-01

Sl.no	Date(week ended)	BSE Sensex	Weekly Return %	Monthly return %	Sl no	Date(week ended)	BSE Sensex	Weekly return %	Monthly return %
1	07-4-00	5219	NA		27	06-10-00	4092	0.05	
2	13-4-00	5172	-0.9	NA	28	13-10-00	3739	-8.63	-8.83
3	20-4-00	4657	-9.96		29	20-10-00	3693	-1.23	
4	28-4-00	4658	0.02		30	27-10-00	3729	0.98	
5	05-5-00	4694	0.77		31	03-11-00	3936	5.55	
6	12-5-00	4107	-12.5	-12.3	32	10-11-00	3941	0.12	3.73
7	19-5-00	4069	-0.93		33	17-11-00	3906	-0.88	
8	26-5-00	4085	0.39		34	24-11-00	3868	-0.97	
9	02-6-00	4453	9.0		35	01-12-00	4032	4.24	
10	09-6-00	4730	6.22	16.25	36	08-12-00	4156	3.07	2.69
11	16-6-00	4765	0.74		37	15-12-00	4137	-0.46	
12	23-6-00	4722	-0.9		38	22-12-00	3906	-5.58	
13	30-6-00	4749	0.57		39	29-12-00	3972	1.69	
14	07-7-00	4906	3.30		40	05-01-01	4184	5.34	
15	14-7-00	4857	-1.0	-9.94	41	12-01-01	4037	-3.51	9.01
16	21-7-00	4464	-8.09		42	19-01-01	4194	3.89	
17	28-7-00	4277	-4.2		43	25-01-01	4330	3.24	
18	04-8-00	4186	-2.13		44	02-02-01	4352	0.51	
19	11-8-00	4192	0.14	4.68	45	09-02-01	4397	1.03	-4.80
20	18-8-00	4347	3.4		46	16-02-01	4330	-1.52	
21	25-8-00	4417	1.6		47	23-02-01	4122	-4.80	
22	31-8-00	4477	1.4		48	02-3-01	4095	-0.66	
23	08-9-00	4668	3.82		49	09-3-01	3882	-5.2	-12.57
24	15-9-00	4562	-2.27	-8.64	50	16-3-01	3746	-3.5	
25	22-9-00	4032	-11.6		51	23-3-01	3635	-0.03	
26	29-9-00	4090	1.44		52	30-3-01	3604	-0.85	

Yearly return for 2000-01 =   -22.8 %

Cost of Equity
BSE market rates of returns for the period 2000-2004
Year 2001-02

Sl.no	Date(week ended)	BSE sensex	Weekly Return %	Monthly return %	Sl no	Date(week ended)	BSE Sensex	Weekly return %	Monthly return %
1	06-4-01	3576	-0.78		27	05-10-01	2813	0.03	
2	12-4-01	3184	-10.96	-5.02	28	12-10-01	2959	5.19	7.47
3	20-4-01	3583	12.53		29	19-10-01	3017	1.96	
4	27-4-01	3423	-4.41		30	25-10-01	3022	0.17	
5	04-5-01	3515	2.60		31	02-11-01	3053	1.03	
6	11-5-01	3560	1.28	6.92	32	09-11-01	3080	0.88	8.80
7	18-5-04	3655	2.67		33	15-11-01	3180	3.25	
8	25-5-01	3660	0.14		34	23-11-01	3252	2.26	
9	01-6-01	3558	-2.79		35	29-11-01	3288	1.11	
10	08-6-01	3496	-1.74	-5.55	36	07-12-01	3436	4.50	
11	15-6-01	3373	-3.52		37	14-12-01	3354	-2.39	-0.79
12	22-6-01	3382	0.27		38	21-12-01	3235	-3.55	
13	29-6-01	3457	2.22		39	28-12-01	3184	-1.58	
14	06-7-01	3306	-4.37		40	31-12-01	3262	2.50	
15	13-7-01	3454	4.48	-5.93	41	04-01-02	3376	3.49	
16	20-7-01	3341	-3.27		42	11-01-02	3363	-0.39	2.15
17	27-7-01	3252	-2.66		43	18-01-02	3377	0.42	
18	03-8-01	3325	2.25		44	25-01-02	3332	-1.33	
19	10-8-01`	3316	-0.27	-0.22	45	01-02-02	3334	0.06	
20	17-8-01	3297	-0.57		46	08-02-02	3494	4.80	8.16
21	24-8-01	3306	0.27		47	15-02-02	3602	3.09	
22	31-8-01	3245	-1.85		48	22-02-02	3604	0.55	
23	07-9-01	3198	-1.45		49	01-3-02	3679	2.08	
24	14-9-01	2830	-11.51	-13.34	50	08-3-02	3657	-0.60	-3.75
25	21-9-01	2600	-8.13		51	15-3-02	3618	-1.06	
26	28-9-01	28123	8.15		52	22-3-02	3516	-2.82	
					53	28-3-02	3469	-1.34	

Yearly return for the year 2001-02 = -3.75

Cost of Equity
BSE market rates of returns for the period 2000-2004
Year 2002-03

Sl.no	Date(week ended)	BSE sensex	Weekly Return %	Monthly return %	Sl no	Date(week ended)	BSE Sensex	Weekly return %	Monthly return %
1	05-4-02	3501	0.92		27	04-10-02	2931	-3.49	
2	12-4-02	3511	0.29	-2.80	28	11-10-02	2996	2.22	-5.30
3	19-4-02	3364	-4.18		29	18-10-02	3010	0.47	
4	26-4-02	3372	0.24		30	25-10-02	2876	-4.45	
5	03-5-02	3381	0.27		31	01-11-02	2951	2.61	
6	10-5-02	3431	1.48	-7.30	32	08-11-02	2957	0.20	12.27
7	17-5-02	3334	-2.83		33	15-11-02	3034	2.60	
8	24-5-02	3256	-2.34		34	22-11-02	3142	3.56	
9	31-5-02	3126	-4.0		35	29-11-02	3229	2.77	
10	07-6-02	3218	2.94		36	06-12-02	3306	2.38	
11	14-6-02	3312	2.92	3.81	37	13-12-02	3343	1.11	4.58
12	21-6-02	3243	-2.08		38	20-12-02	3337	-0.18	
13	28-6-02	3245	0.06		39	27-12-02	3398	1.83	
14	05-7-02	3331	2.65		40	31-12-02	3377	-0.62	
15	12-7-02	336	-0.75	-6.81	41	03-01-03	3358	-0.56	-3.76
16	19-7-02	3230	-2.30		42	10-01-03	3359	0.03	
17	26-7-02	3024	-6.38		43	17-01-03	3370	0.33	
18	02-8-02	2985	-1.29		44	24-01-03	3288	-2.43	
19	09-8-02	2976	-0.30	5.19	45	31-01-03	3250	-1.16	
20	16-8-02	3066	3.02		46	07-02-03	3280	0.92	
21	23-8-02	3119	1.73		47	14-02-03	3233	-1.74	1.05
22	30-8-02	3181	1.99		48	21-02-03	3307	2.60	
23	06-9-02	3141	-1.26		49	28-02-03	3284	-0.69	
24	13-9-02	3099	-1.34	-4.53	50	07-3-03	3153	-3.99	
25	20-9-04	3024	-2.42		51	13-3-03	3108	-1.43	-5.15
26	27-9-02	3037	0.43		52	22-3-03	3219	3.57	
					53	28-3-03	3115	-3.23	

Yearly return for the year 2002-03   = -10.20

Cost of Equity
BSE market rates of returns for the period 2000-2004
Year 2003-04

Sl.no	Date(week ended)	BSE sensex	Weekly Return %	Monthly return %	Sl no	Date(week ended)	BSE Sensex	Weekly return %	Monthly return %
1	04-4-03	3168	1.70		27	03-10-03	4553	3.88	
2	11-4-03	2998	-5.40	-6.13	28	10-10-03	4769	4.74	11.96
3	17-4-03	2985	-0.43		29	17-10-03	4931	3.39	
4	25-4-03	2924	-2.04		30	25-10-03	4802	-2.62	
5	02-5-03	2967	1.47		31	31-10-03	4907	2.19	
6	09-5-03	2950	-0.57	8.79	32	07-11-03	4972	1.32	
7	16-5-03	3057	3.63		33	15-11-03	4912	-1.21	2.81
8	23-5-03	3050	-0.23		34	21-11-03	4839	-1.49	
9	30-5-03	3181	4.29		35	28-11-03	5045	4.26	
10	06-6-03	3303	3.84		36	05-12-03	5132	1.72	
11	13-6-03	3354	1.54	12.64	37	12-12-03	5316	3.56	15.74
12	20-6-03	3500	4.35		38	19-12-03	5541	4.23	
13	27-6-03	3583	2.37		39	26-12-03	5699	2.85	
14	04-7-03	3622	1.09		40	31-12-03	5839	2.46	
15	11-7-03	3676	1.49	3.99	41	02-01-04	6027	3.22	
16	18-7-03	3485	-5.19		42	09-01-04	6120	1.54	-2.45
17	25-7-03	3726	6.91		43	16-01-04	596	-2.84	
18	01-8-03	3815	2.39		44	23-01-04	5816	-2.19	
19	08-8-03	3884	1.81	13.93	45	30-01-04	5696	-2.06	
20	14-8-03	3921	0.95		46	06-02-04	5786	1.58	
21	22-8-03	4125	5.20		47	13-02-04	6012	3.91	-0.49
22	29-8-03	4245	2.91		48	20-02-04	5851	-2.68	
23	05-9-03	4369	2.92		49	27-02-04	5668	-3.13	
24	12-9-03	4306	-1.44	3.25	50	05-03-04	5880	3.74	
25	19-9-03	4217	-2.07		51	12-03-04	5700	-3.06	-2.45
26	26-9-03	4383	3.94		52	19-03-04	5443	-4.51	
					53	26-03-04	5529	1.58	

Yearly return for the year 2003-04 = 77.5 %

Critical values of *t* for two-tailed tests

Significance level (a)

Degrees of freedom (dfJ	.2	.15	''	.OS	.025	.0,	.005	001	
1	3.078	4.165	6.314	12.706	25.452	63.657	127..321	636.619	
2	1.886	2.282	2.920	4.303	6.205	9.925	14.oes	31.588	
3	1.638	1.924	2.353	3.182	4.177	5.841	7.453	12.924	
"	'1.533	1.778	2.132	2.776	3.495	4.604	5.598	8.610	
5	1.476	1.699	2.015	2.571	3.163	4.032	4.773	6.889	
6	1.440	1.650	1.943	2.447	2.969	3.707	4.317		.408
7	1.415	1.617	1.895	2.365	2.841	3.499	4.029		.041
a	1..397	1.592	1.860	2.306	2.752	3.355	3.833		.781
9	1383	1,574	1.833	2.262	2.685	3.250	3.690		.587
10	.372	1.559	1.a,2	2.228	2.634	3.168	3,581		
11	1.383	1.548	"796	2.201	2.593	3.106	3.497	4.437	
12	t:356	1.536	t.7132'	2.179	2.560	9.0SS	3.428	4.318	
13	1,350	1,530	1 771	2.160	2.533	,to12	3,372	4.221	
i4	t.345	1.523	1.761	2.145	2,510	2.977	3.326	4.140	
15	1.341	t!St7	U53	2.131	2.490	2.947	3.286	4.073	
16	1.337	1.512	1.746	2.,20	2.473	2.921	3.252	4.015	
17	1.333	1,£08	1,740	2.110	2.458	2..898	3.222	3.965	
18	1.330	t O4	1,734	2.101	2.445,	2..878	3.197	3.922	
19	1.328	1.500	1.729	2.093	2.-433	2.861	1.174	3.883	
20-	1.325	1.497	1.725	2.086	2.42.3	2.84S	3.,53	3.850	
21	1.323	1.494	1.721	2.000	2.414	2.,831	3.135	3.819	
22	1,321	MSl:2	'1.71,7	2..074	2.405	2.819	3.119	3.792	
23	1.319	1.489	1.'14	2.069	2.398-	2,80?	3.104	3.768	
·24	1.318	1.487	1.711	2.064	2.391	2.797	3.091	3.745	
25	1.316	1-.48	1.700	2..060	2.385	2.787	a.o7a	3.725	
26	1.31§	1.483	1.700	2.056	2.379	2.779	3.007	3 707	
27	1 14	1:.482	1.703	2.052	2.373	2.771	3.057	3.690	
28	1.3 3	1.480	1,701	2.048	2.368	2.783	3.047	3.674	
29	1.311	1.479	1.699	2.045	2.364	2.758	3.038-	3.659	
30	1.310	U77	1.697	2.042	2.360	2J50	3.030	3.646	
40	1.303	1.468	1.684	2.021	2.329	2.704	2.971	3.551	
50	1.299	1.462	1,676	2.009	2..311	2.678	2.937	3.496	
60	1.296	1.458	1.671	2.000	2.299	2.660	2.915		
70	1.294	1A56	1.667	1.994	2.291	2.6..«l	2.899	3.435	
·80	1.292	1.453	1.664	1.990	2.284	2.639	2.887	3.416	
100	t.290	1.461	1.660	1.984	2.276	2.626	2.en	3.390	
1000	1.282	1.441	1.646		2.245	2.581		3.300	
Infinite	t.282	1.440	1.645		2.241	2.576	2.807	3.291	