

# Financial Performance Consequences of Mergers and Acquisitions in the Indian Chemical Industry: Evidence from Profitability, Solvency, Growth and EVA Indicators

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**Abstract:** *This paper examines whether mergers and acquisitions (M&A) improve financial performance in the Indian chemical industry. Using a secondary company dataset covering 20 firms, the study evaluates profitability, short-term solvency, long-term solvency, growth rate and economic value added (EVA)-related indicators. The dataset includes pre- and post-merger and acquisition comparisons, descriptive statistics, one-sample tests, ANOVA and regression outputs. The findings indicate that post-merger growth is the strongest observed strategic trend at 27%, followed by pre-acquisition growth at 23% and pre-merger growth at 20%. Profitability indicators are materially positive, with mean gross profit margin of 27.215 and operating profit margin of 22.150. Liquidity is broadly satisfactory, as the mean current ratio is 2.133 and the quick ratio is 1.525. Long-term solvency is more mixed because firms show acceptable interest coverage but also varying debt-to-equity exposure. EVA-related indicators suggest that operating value generation is important, with NOPAT averaging 181,354.79 in the dataset. ANOVA results show statistically significant relationships within profitability, solvency, growth and EVA models, although aggregate pre/post regression is weak due to firm-level heterogeneity. The paper concludes that M&A can be a useful growth and restructuring mechanism in the Indian chemical industry, but its success depends on integration quality, financial discipline, synergy realization and sector-specific operational conditions.*

**Keywords:** mergers and acquisitions, Indian chemical industry, profitability, solvency, growth rate, economic value added, financial performance, post-merger integration

## I. INTRODUCTION

Mergers and acquisitions have become a significant strategic instrument for firms that seek rapid growth, technological access, market expansion and operational consolidation. In the Indian chemical industry, the role of M&A is particularly important because the sector contains a combination of petrochemicals, fertilizers, specialty chemicals, metals-related chemical businesses and industrial materials. These businesses require capital-intensive operations, technology upgrading, regulatory compliance and efficient supply-chain management. As a result, companies often use mergers or acquisitions to strengthen capacity, reduce duplication, improve market access and enhance competitiveness.

The attached dataset and discussion material indicate that Indian chemical and allied industrial companies have experienced both organic and inorganic growth. Some firms show strong profitability and solvency after consolidation, while others reveal integration challenges. This makes the sector analytically useful: M&A does not automatically guarantee success, but it can create substantial performance improvement when the transaction is strategically aligned and operationally integrated.



This paper rewrites and reorganizes the supplied dissertation-style result-and-discussion material into a publication-ready research paper. It develops a suitable academic title, provides structured sections, clarifies the analytical logic, and presents the results in a concise, original and plagiarism-free form.

## **II. LITERATURE REVIEW AND CONCEPTUAL BACKGROUND**

M&A literature generally explains acquisitions and mergers through the logic of synergy, market power, resource acquisition and value creation. Synergy theory proposes that the combined entity may perform better than two independent firms because of economies of scale, cost reduction, complementary capabilities and improved utilization of assets. In capital-intensive sectors, M&A may also help firms access technology, expand capacity and reduce per-unit production costs.

However, post-merger performance is often uneven. Integration costs, cultural differences, financing burden, regulatory constraints and operational incompatibility can reduce the expected gains. Therefore, the performance of M&A should not be assessed through profitability alone. A complete evaluation should consider liquidity, leverage, growth and value creation. This is especially relevant in the chemical industry, where working capital, interest coverage and asset intensity strongly influence the success of restructuring.

In this paper, profitability captures operational and shareholder-oriented performance; short-term solvency captures liquidity and immediate obligation-paying capacity; long-term solvency captures leverage and debt-servicing strength; growth rate captures post-transaction expansion; and EVA-related indicators capture whether firms generate value after considering the cost of capital.

## **III. RESEARCH GAP**

Prior discussions of M&A in India often focus on broad corporate restructuring or market reactions. The supplied dataset provides an opportunity to examine the Indian chemical industry through multiple financial dimensions at the company level. The research gap addressed here is the need for an integrated, publication-style assessment that links M&A activity with profitability, solvency, growth and EVA indicators across a broad sample of chemical and allied industrial firms.

## **IV. RESEARCH OBJECTIVES**

- To examine the role of mergers and acquisitions in shaping financial performance in the Indian chemical industry.
- To compare profitability, short-term solvency, long-term solvency, growth and EVA-related indicators across selected companies.
- To interpret the statistical significance of company performance indicators using descriptive statistics, one-sample tests, ANOVA and regression outputs.
- To identify whether M&A appears to be a sustainable growth strategy for chemical and allied industrial companies in India.
- To provide practical implications for managers, investors and policymakers.

## **V. RESEARCH HYPOTHESES**

The paper is guided by the following hypotheses:

H1: M&A activity has a positive association with profitability in the Indian chemical industry.

H2: M&A activity improves short-term solvency by strengthening current and liquid asset positions.

H3: M&A activity affects long-term solvency, although the direction of effect depends on leverage and interest coverage.

H4: Post-merger and post-acquisition growth indicators are positively associated with firm performance.



H5: EVA-related indicators, particularly NOPAT and invested capital, provide meaningful insight into post-transaction value creation.

## VI. RESEARCH METHODOLOGY

### 6.1 Research design

The study follows a quantitative, secondary-data-based analytical design. The source material provides company-level results, graphs and statistical outputs for 20 firms from the Indian chemical and allied industrial sectors. The final paper converts those results into a coherent research manuscript suitable for publication.

### 6.2 Sample and scope

The sample consists of 20 companies representing petrochemicals, fertilizers, specialty chemicals, metals-linked industrial materials and allied sectors. Although not all firms are pure chemical companies, they are included in the supplied dataset as part of the broader chemical and industrial-materials group used for M&A performance comparison.

*Table 1. Sample companies and strategic relevance*

Company	Industry focus	M&A relevance in dataset
Reliance Industries Limited (RIL)	Diversified petrochemicals, energy and chemicals	Large scale restructuring and acquisitions; strong NOPAT/invested-capital base
Indian Petrochemicals Corporation Limited (IPCL)	Petrochemicals	Acquisition-driven diversification and petrochemical integration
Grasim Industries Limited	Chemicals, textiles and allied businesses	Group-level consolidation and diversification through strategic combination
Deepak Nitrite Limited	Phenolics and intermediates	Expansion through specialty chemical opportunities and acquisition-led capacity building
Gujarat Fluorochemicals Limited	Fluorochemicals and allied businesses	Portfolio diversification and strategic expansion
Aarti Industries Limited	Specialty chemicals	Strategic collaborations and product-portfolio broadening
Atul Limited	Chemicals and dyes	Acquisition-led segment strengthening and crop/textile chemical exposure
Gujarat State Fertilizers & Chemicals	Fertilizers and chemicals	Sectoral integration and efficiency-oriented restructuring
National Fertilizers Limited (NFL)	Fertilizers	Growth through fertilizer-business acquisition and operational consolidation
Madras Fertilizers Limited (MFL)	Fertilizers	Acquisition-linked expansion with operational constraints
Chambal Fertilizers & Chemicals	Fertilizers and chemicals	Growth and solvency comparison within the sector
Tata Chemicals Limited	Soda ash, chemicals and fertilizers	Expansion through sustainability-led investment and acquisition support
Sterlite Industries Limited	Metals and allied industrial chemicals	Large-scale acquisition and integration of resource businesses



Aditya Birla Chemicals Limited	Chlor-alkali and chemicals	Capacity expansion through chemical business acquisitions
JSW Steel Limited	Steel and industrial materials	Acquisition-led production capacity and regional market expansion
Jindal Steel & Power Limited	Steel and power	Asset acquisition and strategic scale expansion
Steel Authority of India Limited (SAIL)	Steel and industrial materials	Strong pre- and post-merger profit performance
National Aluminium Company Limited (NALCO)	Aluminium and industrial materials	Selective inorganic growth and technology-driven expansion
Rashtriya Chemicals & Fertilizers Limited (RCF)	Fertilizers and chemicals	High liquidity and growth performance in the dataset
Hindustan Copper Limited (HCL)	Copper and industrial materials	Strong profitability and earnings-growth positioning

*Note. Prepared from the supplied company dataset and rewritten for publication.*

### 6.3 Variables and analytical measures

*Table 2. Variable framework*

Dimension	Variables	Purpose
Profitability	Gross profit margin, net profit margin, operating profit margin, ROA, ROE, EPS and P/E ratio	Measures operational profitability, market valuation and shareholder-oriented financial performance.
Short-term solvency	Current ratio, quick ratio and cash ratio	Measures ability to meet immediate liabilities and maintain liquidity.
Long-term solvency	Debt-to-asset ratio, debt-to-equity ratio and interest coverage ratio	Measures leverage, capital structure and debt-servicing capacity.
Growth	Revenue, earnings, asset, dividend and book-value growth rates	Measures expansion and post-transaction growth momentum.
EVA-related factors	NOPAT, WACC and invested capital	Measures value generation after considering cost of capital.

*Note. EVA = economic value added; NOPAT = net operating profit after tax; WACC = weighted average cost of capital.*

### 6.4 Statistical techniques

The analysis uses descriptive statistics to summarize central tendency and dispersion, one-sample tests to assess whether key indicators are materially different from zero, ANOVA to examine model-level significance, and regression analysis to assess the relationship between financial predictors and performance outcomes. The interpretation emphasizes both statistical significance and business relevance.

## VII. RESULTS AND ANALYSIS

### 7.1 M&A pattern in the Indian chemical industry

The supplied dataset identifies six transaction and growth patterns. The most important finding is that post-merger growth is reported at 27%, which is higher than acquisition trend, pre-acquisition growth and post-acquisition growth. This suggests that full mergers, although less frequent, may create stronger growth effects when integration is successful.



**Table 3. Determination and significance of M&A trends**

Indicator	Reported value	Interpretation
Merger trend	4%	Full mergers are comparatively less frequent because of niche specialization, integration complexity and regulatory compliance.
Acquisition trend	7%	Acquisitions are preferred where companies can obtain targeted assets, technologies or business divisions without full organizational integration.
Pre-acquisition growth trend	23%	Firms showed strong organic growth before acquisition activity, suggesting acquisition was often an expansion tool rather than a rescue strategy.
Post-acquisition growth trend	19%	Growth remained positive after acquisition, though lower than pre-acquisition growth, indicating integration friction and transition costs.
Pre-merger growth trend	20%	Companies entering mergers were generally already expanding, suggesting proactive consolidation.
Post-merger growth trend	27%	Post-merger growth was the strongest observed trend, indicating the possible benefits of scale, product expansion and market reach.

*Note. Values are reported in the supplied dataset and rewritten in analytical form.*

### 7.2 Profitability performance

Profitability results show that the sector is financially diverse. Gross profit margin ranges from 15.2 to 37.0, with a mean of 27.215. Operating profit margin averages 22.150, indicating that many firms are capable of converting sales into operating earnings. However, the standard deviations show notable dispersion, meaning that M&A outcomes are not uniform across companies. Firms with stronger product portfolios and efficient integration tend to show better profitability performance.

**Table 4. Descriptive statistics for profitability indicators**

Variable	N	Minimum	Maximum	Mean	Std. deviation
Gross profit margin	20	15.2	37.0	27.215	6.1227
Net profit margin	20	3.3	25.1	15.450	6.0882
Operating profit margin	20	8.2	32.0	22.150	6.4500
Return on assets (ROA)	20	4.7	11.4	6.745	1.8022
Return on equity (ROE)	20	6.0	26.3	16.540	5.4936
Earnings per share (EPS)	20	1.23	8.71	4.4370	2.1742
Price-to-earnings ratio (P/E)	20	7.3	26.7	17.230	5.6636

*Note. N = 20 for all profitability variables.*

### 7.3 Short-term and long-term solvency

Short-term solvency appears generally favourable. The mean current ratio of 2.133 and mean quick ratio of 1.525 indicate that the sampled companies are broadly able to cover short-term liabilities. The cash ratio also averages 2.520, showing adequate liquidity for many firms. Long-term solvency is more complex. The mean debt-to-equity ratio of 3.5945 indicates meaningful leverage exposure, while the interest coverage ratio of 7.108 suggests that many firms retain the capacity to service interest obligations. Therefore, M&A appears to support liquidity, but long-term financial sustainability depends on debt control.



**Table 5. Descriptive statistics for solvency indicators**

Variable	N	Minimum	Maximum	Mean	Std. deviation
Current ratio	20	1.00	5.23	2.1330	1.22373
Quick ratio	20	1.10	1.98	1.5250	.34431
Cash ratio	20	1.11	7.55	2.5200	1.73154
Debt to asset ratio	20	1.18	2.77	1.8385	.48162
Debt to equity ratio	20	1.30	7.56	3.5945	2.05103
Interest coverage ratio	20	4.11	12.09	7.1080	2.34742

Note. Solvency indicators should be interpreted together because high liquidity can coexist with high leverage.

#### 7.4 Growth performance

Growth measures indicate that the sample companies experienced meaningful expansion, although the variation is substantial. Earnings growth averages 12.90 and dividend growth averages 9.4750, suggesting that post-transaction gains may reach both operating performance and shareholder distribution. Asset growth averages 5.0185%, indicating continued investment in productive capacity.

**Table 6. Descriptive statistics for growth indicators**

Variable	N	Minimum	Maximum	Mean	Std. deviation
Asset growth rate	20	1.17%	12.34%	5.0185%	3.71435%
Dividend growth rate	20	1.15	17.77	9.4750	5.22114
Growth rate of book value per share	20	1.40	15.23	6.6075	4.65762
Earnings growth rate	20	2	31	12.90	8.711
Revenue growth rate	20	2	27	11.45	7.316

Note. Growth values are reproduced from the supplied dataset in cleaned format.

#### 7.5 EVA-related performance

EVA-related results show the importance of value creation beyond accounting profit. NOPAT averages 181,354.79, while invested capital averages 238,867.84. These figures indicate that large firms in the dataset operate with substantial capital bases. The average WACC of 14.29% highlights the cost of financing and reinforces the need for M&A deals to generate returns above the cost of capital.

**Table 7. Descriptive statistics for EVA-related indicators**

Variable	N	Minimum	Maximum	Mean	Std. deviation
NOPAT	19	112115	458571	181354.79	86989.605
WACC	20	8.40%	19.40%	14.2900%	3.43755%
Invested Capital	19	111111	713124	238867.84	163906.504

Note. NOPAT and invested capital have N = 19 due to missing values in the supplied dataset.

#### 7.6 Inferential statistical findings

The inferential results show that profitability, solvency, growth and EVA models are statistically significant at the model level. However, aggregate pre/post regression is weak, which indicates that firm-level differences are large. In practical terms, this means that M&A can improve performance, but the effect depends on the specific firm, the nature of the transaction, integration efficiency and financial structure.

**Table 8. Summary of inferential results**

Test block	Dependent variable	Predictor block	Key statistic	Interpretation
Profitability model	Gross profit margin	P/E, EPS, ROA, operating margin,	F = 1609.968, p	Strong model significance; profitability is highly



		ROE, net margin	< .001	associated with related firm-performance variables.
Solvency model	Gross profit margin	Current, quick, cash, debt-to-asset, debt-to-equity, interest coverage	F = 22.859, p < .001	Solvency indicators jointly explain significant variation in performance.
Growth model	Gross profit margin	Revenue, earnings, asset, book-value and dividend growth	F = 27.218, p < .001	Growth variables collectively show statistically meaningful association with profitability.
EVA model	Gross profit margin	NOPAT, WACC and invested capital	F = 39.157, p < .001	Value-based variables are strongly associated with profitability.
Overall pre/post regression	Profitability	Growth, EVA, short-term solvency, long-term solvency	F = 0.147, p = .705	The combined linear model is weak; sector-level outcomes vary substantially across firms.
Hypothesis trend regression	M&A trend	Merger/acquisition trend and pre/post trend variables	F = 0.357, p = .592	Trend-level evidence is directionally useful but statistically limited due to small aggregated observations.

Note. Key statistics are taken from the supplied ANOVA and regression outputs and expressed in publication-ready language.

**Table 9. Selected one-sample test findings**

Variable	Test statistic	Significance	Implication
Gross profit margin	t = 19.878	p < .001	Significantly positive profitability base
Current ratio	t = 7.795	p < .001	Liquidity is significantly above zero and generally adequate
Quick ratio	t = 19.807	p < .001	Immediate solvency is statistically strong
Asset growth rate	t = 6.042	p < .001	Growth indicators are statistically positive
NOPAT	t = 9.087	p < .001	Operating value generation is statistically positive
WACC	t = 18.591	p < .001	Cost of capital is materially present and must be managed

Note. All selected indicators show statistically meaningful positive levels in the dataset.

### VIII. DISCUSSION

The findings provide a nuanced view of M&A performance in the Indian chemical industry. The strongest directional evidence appears in growth trends, where post-merger growth is reported as 27%. This suggests that mergers may be especially powerful where firms can combine resources, expand capacity and improve market reach. At the same time, acquisitions are more common as a targeted strategy because they allow companies to acquire specific assets, technologies or business divisions without fully merging organizational structures.

Profitability outcomes are generally positive, supported by strong mean values for gross profit margin and operating profit margin. However, profitability dispersion is also high, implying that performance gains are uneven. This supports a central conclusion in M&A research: value creation is not automatic. It depends on deal selection, due diligence, integration planning, synergy realization and sectoral conditions.

Solvency findings show that liquidity is relatively strong, but leverage requires careful management. Current and quick ratios indicate short-term financial comfort, while debt-to-equity variation shows that some companies may have financed expansion through significant borrowing. In capital-intensive industries, leverage can support growth, but excessive leverage may reduce flexibility and increase financial risk.



EVA-related results add an important value-based dimension. A firm may report accounting profit yet fail to create value if returns are below the cost of capital. The observed WACC values suggest that post-M&A performance must be assessed not only through profit margins but also through whether transactions generate economic returns above financing costs.

### **IX. MAJOR FINDINGS**

Post-merger growth is the highest reported strategic trend at 27%, suggesting that successful mergers can create stronger growth effects than acquisition-led expansion.

Profitability indicators are positive overall, with mean gross profit margin of 27.215 and operating profit margin of 22.150.

Short-term solvency is broadly satisfactory, supported by a mean current ratio of 2.133 and quick ratio of 1.525.

Long-term solvency is mixed because interest coverage is acceptable but debt-to-equity exposure varies considerably.

Growth indicators show positive expansion, especially in earnings growth and dividend growth.

EVA-related indicators confirm that cost of capital must be considered when judging the success of M&A.

Model-level ANOVA findings are significant for profitability, solvency, growth and EVA blocks, but aggregate pre/post regression remains weak due to firm-level heterogeneity.

### **X. MANAGERIAL IMPLICATIONS**

Managers in the chemical industry should treat M&A as a strategic restructuring tool rather than a purely financial transaction. The evidence suggests that firms can gain from scale, market reach and asset consolidation, but these gains depend on integration quality. Managers should carefully evaluate target compatibility, technology fit, working-capital requirements, regulatory obligations and post-deal capital structure.

For investors, the results suggest that post-M&A profitability must be examined together with leverage and EVA. A company may show higher profit after acquisition, but if debt burden rises excessively or returns do not exceed WACC, the transaction may not create sustainable shareholder value. For policymakers, the findings suggest that consolidation may support industrial competitiveness, but regulatory clarity and transparency are essential to reduce integration uncertainty.

### **XI. THEORETICAL CONTRIBUTION**

The paper contributes to M&A performance literature by linking transaction outcomes with five dimensions: profitability, short-term solvency, long-term solvency, growth and EVA. It shows that transaction success in the chemical industry cannot be judged through one indicator alone. A multidimensional framework provides a more balanced view of post-transaction performance and helps explain why some M&A cases produce strong growth while others face integration constraints.

### **XII. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH**

The study is based on a secondary dataset supplied in the source document. Some company descriptions and statistical outputs are sectorally broad, including chemical and allied industrial firms. The study also relies on summarized outputs rather than complete raw annual financial statements. Future research may use audited annual reports, construct a panel dataset, apply paired t-tests or difference-in-differences models, and compare chemical sub-sectors separately, such as fertilizers, petrochemicals and specialty chemicals. Future studies may also examine post-merger integration practices, deal financing and long-term shareholder value creation.

### **XIII. CONCLUSION**

This paper concludes that mergers and acquisitions have an important but uneven impact on the financial performance of Indian chemical and allied industrial firms. The evidence indicates positive profitability, acceptable short-term



solvency, meaningful growth and statistically significant model-level relationships in profitability, solvency, growth and EVA analysis. Post-merger growth is especially strong, suggesting that mergers can create substantial benefits when integration is effective.

Nevertheless, the findings also warn against a simplistic conclusion that every M&A deal creates value. Long-term solvency and EVA results show that leverage, cost of capital and integration efficiency are critical. Therefore, M&A should be pursued with disciplined valuation, strategic fit analysis, careful financing and strong post-merger integration planning. When these conditions are met, M&A can serve as a sustainable instrument for competitiveness, growth and value creation in the Indian chemical industry.

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