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# SYNERGY VALUATION IN MERGERS AND ACQUISITIONS IN THE STEEL INDUSTRY: AN INDIAN CONTEXT

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**Abstract** *This study attempts to value synergy gains in the mergers and acquisitions in the Indian steel industry. To value synergy, a neural network model has been created, where the change in financial ratios are the independent variables the value of the target company is the dependent variable. Along with the neural network, event study has been carried out, where cumulative abnormal returns (CAR) has been calculated to see if the acquiring companies' shareholders gain wealth post the M&A transaction. This helps in understanding if the shareholders see merit in the transaction. For creating the model and to calculate CAR, the data from 2000-2019 has been taken from the Bloomberg terminal. The data consists of 30 M&A transactions in the steel industry in India. The results of the neural network indicate that the acquiring companies end up over paying for the synergy gains and the results of the event study show that the acquiring companies' shareholders do not gain any wealth post the M&A transaction. The results will help managers in valuing the target companies for M&A in the future.*

**Keywords:** *Mergers and Acquisitions, Steel Industry, Neural Network, Event Study, Cumulative Abnormal Returns*

## INTRODUCTION

With the advent of globalisation, competition among the firms has become intense. To survive and gain a competitive edge, firms across the globe are going for different strategies, whether organic or inorganic, such as mergers and acquisitions (M&A), joint ventures, and so on. Among the various options, M&A is considered one of the most popular strategies to gain a competitive advantage over a rival (Kumar & Bansal, 2008). In the years after the 2008 financial crisis, there has been an upsurge in M&A activity, often known as the sixth and seventh merger wave. The previous waves were only about M&A in developed nations. However, M&A deals are not only common in developed economies, but are also seeing an upsurge in the emerging economies (Kumar & Bansal, 2008). There are various reasons why firms go for M&A. Generally, the motivation behind M&A is to gain more market share, enter new markets, gain more pricing power, diversification (Huh, 2015), synergy gains (Bradley & Kim, 1988), and so on.

Among these reasons, synergy gain is often cited as one of the primary reasons to justify M&A (Damodaran, 2005). Synergy, as defined by Damodaran (2005), is the additional value that is generated by combining two firms, that is, creating opportunities that would not have been available to these firms operating independently. Some researchers have defined synergy from the perspective of shareholders as well. Bradley and Kim (1988) defines synergy as the sum of the change in the wealth of the shareholders of the target and acquiring firms. So, the question arises, is the synergy for which the acquiring firm pays millions of dollars to the target firm realised? If yes, in what form and when? The main objective of this study is to estimate the synergy gains in M&A transactions in the steel industry of India. For this study, we will consider the definition of synergy from the shareholders' perspective and try to estimate the change in the wealth of the shareholders for both the acquirer and the target.

India observed a surge in M&A activity after the liberalisation reforms of 1991 (Reddy, Nangia & Aggarwal, 2013). After liberalisation, Indian companies had an opportunity to grow, diversify, and modernise with the help of M&A as the government restrictions lessened (Kumar & Bansal, 2008). Fig. 1 shows the trend of M&A in India from 1996 onwards.

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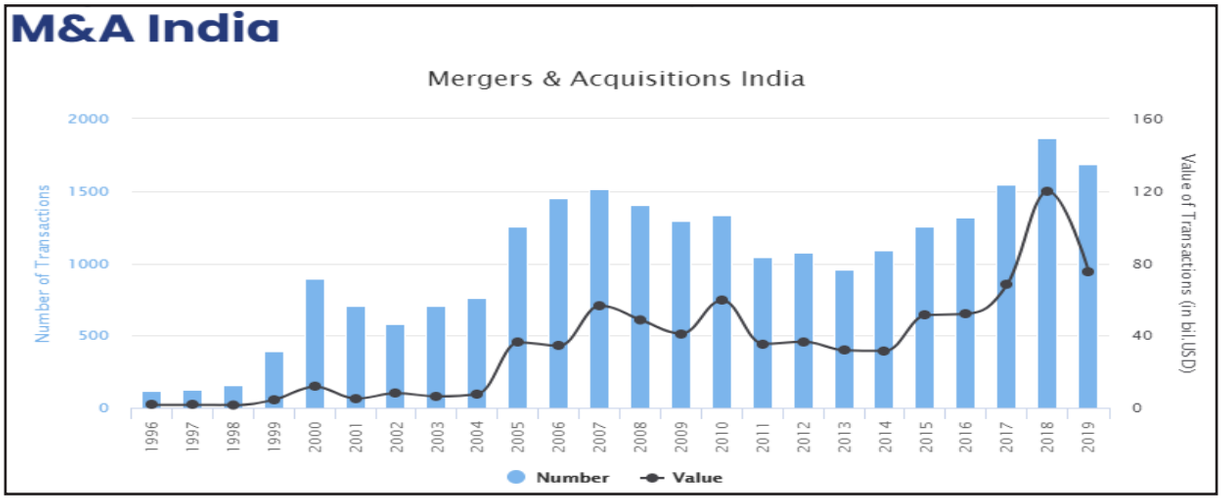


Source: https://imaa-institute.org/m-and-a-statistics-countries/

**Fig. 1: M&A Statistics in India**

As can be seen in Fig. 1, M&A activity in India started picking up in 2000. The period 2004-2008 saw a large number of deals. It is during this period that we see big mergers such as Tata Steel and Corus Steel. However, with the 2008 crisis, the world economy was severely hit, which led to a decrease in M&A activity in the later years (Huh, 2015). From 2014 onwards, we again see a rise in M&A activity in India. In India, a majority of M&A transactions are seen in the technology sector, followed by the materials sector. With the increase in M&A activity, it is essential to understand the synergy gains that these M&A can generate, which will help the bankers and financial advisors analyse the M&A deals properly. The current literature talks about the synergy valuation in the M&A deals; however, not much literature is available for emerging economies like India. Earlier researches have shown mixed results regarding synergy gains in the M&A deals. As a result, this study will contribute to the existing literature and help in understanding the synergy gains in India.

The current study focuses on the Indian steel industry for the synergy valuation. Previous studies have faced criticism as they lack the focus on characteristics of specific industries (Huh, 2015). The previous studies tried to generalise the results for the entire market; to avoid this, in this study, the focus is only on the steel industry. Why the steel industry? In 2019, India was the second-largest producer of crude steel in the world, with 110.92 MT production (Kumar, Bandi & Tenneti, 2019). The steel industry contributes to nearly 2% of the GDP of India and employs six lakh people. Approximately, 60% of the steel manufactured is used in infrastructure construction in India, and with increased spending on infrastructure projects by the current government, it can give a boost to the Indian steel industry. Currently, the Indian steel industry is going through a process of consolidation (Nair, 2018). The reason for this is the high leverage taken by Indian steel companies to increase their production capacity and compete at the global level. However, post the 2008 crisis, the steel prices plummeted because of the excess capacity, and the Indian companies could earn enough to repay the debt. To add to the problems, China started dumping steel in India and other economies across the globe, which made Indian steel uncompetitive within India itself. As a result, many companies were declared bankrupt under the Indian Bankruptcy Code (IBC), where the existing big steel players, including foreign players, showed enthusiasm in acquiring these companies. The current government has also introduced policy changes to make India an attractive destination for steel manufacturing. In India, there are more than 750 steel manufacturers. Therefore, we can see a lot of consolidation taking place in the future. As a result, studying synergy valuation in the steel industry can provide important implications for the managers and can contribute to the existing literature.

## REVIEW OF LITERATURE

The objective of this study is to value the synergy in the Indian M&A deals. For this, understanding the concept of synergy and the valuation methods is very important. The literature review covers the basic concept of synergy, the valuation methods used in previous studies, and the implications of synergy on the M&A deals.

## CLASSIFICATION OF SYNERGY

Various authors have described different types of synergies. Chatarjee (1986) initially classified the synergies as financial synergy, operating synergy, and collusive synergy. He defined financial synergy as the ability to reduce the cost of capital; operating synergy as the ability to reduce the cost of production; and collusive synergy as the ability to gain more market power. After a few years, Slusky and Caves (1991) classified the synergies as real synergy and financial synergy. Their classification of financial synergy was similar to financial synergy as defined by Chatarjee (1986), whereas real synergy was defined as the fit between the assets of both the companies, so that the acquiring company could utilise the assets of the target company. The definition was similar to the operating synergy definition provided by Chatarjee (1986). Years later, Damodaran (2005) classified the synergies as operating synergy and financial synergy. His definition of operating synergy was very similar to that of Chatarjee (1986); however, he also included the collusive synergy classification (Chatarjee, 1986). He divided the operating synergies into four parts, namely economies of scale, greater pricing power, a combination of different functional strengths, and higher growth in new or existing markets. The definition of financial synergy was also expanded by him; over and above the reduction in the cost of capital (Chatarjee, 1986), he also included the ability to generate higher cash flows. He divided the financial synergies into excess or slack in cash, debt capacity, tax benefits, and diversification. Various authors have classified synergies in a different way which can lead to confusion; however, at the core, most of them have a similar meaning. Based on the literature studied, the classification provided by Damodaran (2005) seems to be the most exhaustive. It is of prime importance to understand the classification of synergies. However, for this study, the classification is not of utmost importance. The study focuses on valuing synergy and not on which type of synergy. So, literature on understanding the different methodologies that can be adopted to value synergy were looked into.

### Valuing Synergy

Synergy valuation can be challenging, given that there are multiple factors involved. However, various authors have provided different valuation methods to measure synergy gains. Some authors have used event study methodology, whereas some have used the financial ratios and have run statistical tests, such as regression, T-Test, and so on, on the ratios. Chatarjee (1986), Bradley and Kim (1988), Kohli and Mann (2012), Reddy, Nangia and Aggarwal (2013), Kalsie and Nagpal (2017), Mal and Gupta (2020), Mall and Gupta (2019) have used the event study methodology to value synergy, whereas Slusky and Caves (1991), Kumar and Bansal (2008), Huh (2015), Chavda and Raval (2019) have used ratio analysis and a combination of statistical tools for the same. Damodaran (2005) has used the DCF framework to value synergy. Varghese and Thaha (2017) have used ratio analysis to understand the performance of the acquirer post the merger. For the purpose of this study, the event study methodology and neural network will be used. Since one of the methods being used here is event study methodology, literature related to it have also been included in the current study. Banerjee (2021), Chakraborty and Chetan (2018), and Mishra, Vyas and Meena (2021) have used the event study methodology to understand the effect of different events on the stock prices. In addition, the current study tries to understand the effect of mergers on the stock prices and tries to see if abnormal returns can be earned because of the merger.

### Implications of Synergy

After valuing synergy, it is essential to understand the implications of the value for it to be useful to the managers. It is important to understand which type of M&A transactions create what kind of synergies and how they help the target and the acquirer.

Chatarjee (1986) examined the different types of acquisition strategies and explored the determinants of the performance differences. He concluded that the gains are higher in synergies that focus on financial synergies rather than operational synergies, provided financial synergies are fully exploited. Further, he found that horizontal mergers are better performers in synergy gains than other types of mergers. Slusky and Caves (1991) also tried to understand the factors that affect the value created by mergers through the premium paid by the acquiring firms. He concluded that the real synergy, i.e., the fit of the target company's assets, did not affect the premium paid for the target company. However, the financial synergies (debt levels) and agency factors (board of directors and managers) played a significant role in deciding the premium for the target company. Huh (2015) examined whether the acquisition done by the financial institution and the related company created any difference in the synergy. He found that the horizontal mergers improved the operating performance of the firm, whereas the acquisition by financial institutions did not enhance the operating performance of the firm, but instead led to higher P/E ratio.

Bradley and Kim (1988) estimated the magnitude of the synergistic gains in corporate acquisitions and examined the factors that determine the division of synergistic gains between the stockholders of both the firms. He found that the synergistic gains are present in the acquisitions under study.

The distribution of acquisition is more skewed towards the target firm. The acquirer receives very less share from the total gain, and if any competitor bid is present, the gain is nearly zero. In addition, the gains are a zero-sum game, i.e., the gains to the target firm come at the cost of the acquirer. This was one of the first studies in the literature that divided the synergy gains between the acquirer and the target company. It helps in establishing that, generally, the target company tends to gain more in the M&A deals. This argument has been suggested by Damodaran (2005) as well who studied the potential sources of synergy and tried to value it. He concluded that there is some evidence of synergy in almost all the mergers and acquisitions; however, most of them fail to deliver its benefits. In most cases, the acquiring firm shareholders tend to lose, as they overpay for the synergy. The reason may be managerial hubris, the bias in the estimation process, and a failure to plan for synergy. Kalsie and Nagpal (2017) found similar results when they evaluated the financial synergies realisations in M&A deals in India and observed that the longer the time frame, the more difficult it becomes to realise a synergy, which decreases the chance of achieving it significantly. They also argued that before the merger, the synergy is often overvalued, making it difficult to reach the desired synergy target. The argument of Damodaran (2005) and Kalsie and Nagpal (2017) regarding the difficulty in achieving the desired synergy is also discussed by Chavda and Raval (2019), where they tried to understand the financial impact of M&A in the steel industry and concluded that there is a possibility of generating synergies in M&A. However, there are lot qualitative factors which act as a hindrance in generating these synergies.

Some authors have studied the effect on the financial performance of the firms after M&A. Kumar and Bansal (2008) examined the M&A deals in India and studied the impact of M&A on the financial performance of the firms in the long run. They found that in both mergers and acquisitions the financial performance improved for a majority of the firms, post transaction. However, in some acquisitions, it was observed that debt-equity ratios increased, creating a financial burden for the company. Reddy, Nangia and Aggarwal (2013) also analysed the long-term financial performance of the acquiring company and concluded that the acquiring firms showed better financial performance for both the manufacturing and service industry post-merger.

Some authors have tried to estimate the wealth creation for the shareholders post-M&A transactions. Mal and Gupta (2020) examined the stock behaviour of the acquirer banks pre- and post-merger and acquisitions (M&A) announcement period in the Indian banking sector. They found that the acquirer banks achieved positive average abnormal returns before the merger took place. However, the returns were fluctuating in nature. At the same time, the stock liquidity improved pre-, as well as post-merger, and the liquidity was highest on the day of the merger. Kohli and Mann (2012) ascertained and compared the acquiring company wealth gains in domestic and cross-border acquisitions in India. They concluded that the cross-border acquisitions resulted in higher wealth creation than the domestic acquisitions for the acquiring company's shareholders. However, this wealth creation highly depended on whether the firm could realise synergies from the acquisition. Further, it was observed that small- and medium-sized firms lead to higher wealth creation.

## Scope

The scope of the study will include mergers and acquisitions in the Indian steel industry of the companies that fulfil the following criteria:

- The M&A are announced and completed from 01/01/2000 to 31/12/2019.
- The acquirer should be listed on the Indian Stock Exchange.
- The acquirer and the target company should be from the steel sector.

Using the Bloomberg database, 48 transactions have been identified which satisfy the above criteria. Out of these 48, data regarding the value of the deals is available for 30 transactions. For the analysis, data of these 30 deals will be used.

### Objectives

- To understand if the prices paid by the acquirers reflect the synergistic gains in the mergers and acquisitions in the Indian steel industry.
- To see if the shareholders' value is created in the M&A transactions in the short and medium term.

### Hypothesis

- H-1: Effect on the firm's performance.
  - $H_0$: The M&A transactions do not affect the acquiring firm's performance.
  - $H_A$: The M&A transactions affect the acquiring firm's performance.
- H-2: Determination of the price.
  - $H_0$: Acquiring companies do not correctly determine the price of the target, reflecting the synergy gains.
  - $H_A$: Acquiring companies correctly determine the price of the target, reflecting the synergy gains.

- H-3: Gain of shareholders.
  - $H_0$: Shareholders of acquiring companies gain more in the short term than in medium term during the M&A deal.
  - $H_A$: Shareholders of acquiring companies do not gain more in the short term than in medium term during the M&A deal.

# METHODOLOGY

## Neural Network Methodology

The basic premise of the synergy is that the two companies can generate more value by coming together, compared to what they can do alone. As a result, a neural network will be designed to understand if the value that the companies talk about is really generated in the M&A transactions. The data will be divided into two parts: 26 deals' data will be used to train the model and 4 deals' data will be used to test the model. The variables that will be used in the model are:

- Change in profit margin (NPM)
- Change in asset turnover (ATR)
- Change in inventory turnover (ITR)
- Change in accounts receivables turnover (DTR)
- Change in current ratio (CR)
- Change in the investments (INV)
- Change in the equity (EQ)
- Change in the sales (NS)
- Change in the profits (NP)
- Change in return on capital employed (ROCE)

The change will be calculated as the difference between the two financial years before and after the merger. The reason for the same is that the M&A is expected to increase the value for the acquiring company, which should be reflected in the financial variables of the company as well. These variables have been selected as per the models available in the literature.

The first and second hypotheses relating to the effect on the firm's performance and determination of the price are addressed using neural network.

## Event Study Methodology

The value generated by the company should also be enjoyed by the shareholders of the company. The shareholders enjoy the value in terms of returns on their shares. So, to study if the shareholders benefit from the M&A deals, an event study will be conducted across different time periods, which are: (t−1, t+1), (t−5, t+5), (t−15, t+15), and (t−30, t+30). The announcement date will be considered as the event date for the study. Different studies have defined the period in different ways; in general, literature considers one and five days as short-term period, and 15 and 30 days as medium-term period. For the event study, all 30 deals will be considered.

The third hypothesis relating to the gain of the shareholders is addressed using event study methodology.

# RESULTS

## Results of Neural Network

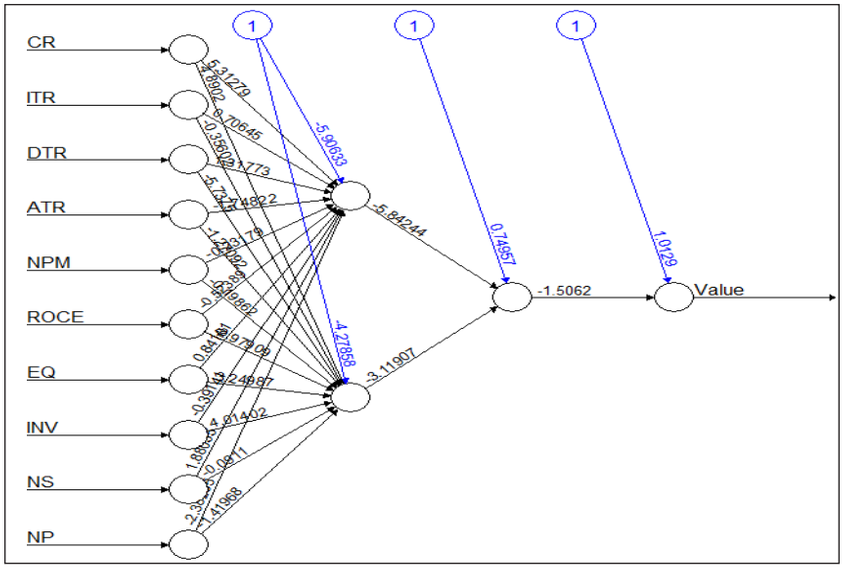


**Fig. 2: Diagrammatic Representation of Neural Network**

For the neural network, the 30 transactions are divided into a training set of 26 transactions and a testing set of four transactions. The model developed is linear in nature and uses back propagation error for fitting the model. For training the model, the number of hidden layers are (2,1), which means that all the 10 variables merge to 2 nodes, which merge into one node. The variables are first scaled using min-max scaling; the scaled data is then used to train and test the model. The model received after training is as follows:

The model is obtained after 272 steps. The root mean squared error (RMSE) of the training set is 0.056 and the RMSE of the testing data is 0.019. After removing the outliers, the average value of the transaction is $262.73 million and the RMSE of 0.019 translates into $39 million, which is approximately 14% of the average value. Considering the current data set and varying values of the transactions, this value of error is acceptable in the current model. However, with more data, the RMSE can be further reduced. Liu & Ma (2009) have used neural network methodology in their study and had an error rate of 11.03%; as a result, we consider the 14% error rate as an acceptable error rate for the current model.

**Table 1: Neural Network – Predicted vs. Observed Values**

| Predicted | Observed |
|---|---|
| −0.0004105405 | 0.0006039810 |
| 0.0380624179 | 0.0000000000 |
| −0.0067071630 | 0.0014928560 |
| 0.0043050569 | 0.0000554764 |

As we can see, there is a huge difference between the predicted and observed values, where the predicted values are mostly lower than the observed values. So, it can be said that the companies generally end up overpaying for the targets, by overestimating the synergy gains the acquirers can generate after acquisition of the target.

*H-1: Effect on the Firm's Performance*

We reject the null hypothesis and conclude that the firm's performance is affected by the M&A transactions.

Using the neural network, we try to address the first 2 hypotheses. Regarding the first hypothesis, which talks about the effect of the M&A transaction on the acquiring firm's performance, we see in the literature that evidence has been found that firm's performance is affected after M&A takes place. Based on that, this neural network was built. This neural network model also tries to establish a relation between the firm's indicators and the price of the target. We see that there is a relation established; therefore, we can say that the acquiring company's performance is affected after the M&A transaction.

*H-2: Determination of the Price*

We cannot reject the null hypothesis, and cannot conclude that companies correctly determine the price of the target companies, reflecting the synergy gains.

The second hypothesis talks about the pricing of the target company. Using the neural network, we try to see if the acquiring companies are able to correctly determine the price of the target. As seen in the above table, there is a lot of difference between predicted and observed values, where the predicted values are much lower than the observed values. Therefore, we can say that the acquiring companies generally end up paying more for the targets. The same is observed by Damodaran (2005) and Kalsie and Nagpal (2017) in their studies, where they argue that companies fail to value their synergy, and the acquiring companies often end up overpaying for the synergy benefits.

## RESULTS OF EVENT STUDY

When we talk about synergy, one school of thought also measures synergy from the shareholders' returns perspective. So, in the research, we have calculated the cumulative abnormal returns (CAR) for the acquiring company. The scope of the data also covers unlisted companies in the target; however, the CAR for the target companies could not be calculated as most of the target companies are unlisted. For the acquiring companies, the CAR has been calculated for four windows: (t−30), (t+30); (t−15), (t+15); (t−5), (t+5); and (t−1), (t+1). The cumulative returns are calculated using the formula:

$AR = R_s - R_m$

Where, AR is abnormal return

$R_s$ is return on the stock

$R_m$ is return on the market (BSE Sensex)

The abnormal returns for each day has been calculated using the above formula and then added, to get the cumulative abnormal return (CAR). Using CAR, one-tailed paired T-test has been performed to check if the returns post M&A are higher than the returns pre M&A. The hypothesis for one-tailed paired T-test is:

$H_0$: The mean CAR is less than or equal, before and after the M&A.

$H_A$: The mean CAR post M&A is greater than the mean CAR pre M&A.

The results of the paired T-Test are as follows:

**Table 2: T-Test Results of (t−30), (t+30) Days**

| | *t-30* | *t+30* |
|---|---|---|
| Mean | -0.009292133 | -0.023898467 |
| Variance | 0.009664767 | 0.008577475 |
| Observations | 30 | 30 |
| Pearson Correlation | 0.07178338 | |
| Hypothesized Mean Difference | 0 | |
| df | 29 | |
| t Stat | 0.614763684 | |
| P(T<=t) one-tail | 0.271752369 | |
| t Critical one-tail | 1.699127027 | |
| P(T<=t) two-tail | 0.543504739 | |
| t Critical two-tail | 2.045229642 | |

**Table 3: T-Test Results of (t−15), (t+15) Days**

| | *t-15* | *t+15* |
|---|---|---|
| Mean | -0.0109255 | -0.015348167 |
| Variance | 0.003897378 | 0.00440341 |
| Observations | 30 | 30 |
| Pearson Correlation | -0.185717643 | |
| Hypothesized Mean Difference | 0 | |
| df | 29 | |
| t Stat | 0.244206828 | |
| P(T<=t) one-tail | 0.404395084 | |
| t Critical one-tail | 1.699127027 | |
| P(T<=t) two-tail | 0.808790169 | |
| t Critical two-tail | 2.045229642 | |

**Table 4: T-Test Results of (t−5), (t+5) Days**

| | *t-5* | *t+5* |
|---|---|---|
| Mean | 0.002532633 | 0.007883867 |
| Variance | 0.002222658 | 0.001760308 |
| Observations | 30 | 30 |
| Pearson Correlation | -0.448748869 | |
| Hypothesized Mean Difference | 0 | |
| df | 29 | |
| t Stat | -0.386251198 | |
| P(T<=t) one-tail | 0.351065025 | |
| t Critical one-tail | 1.699127027 | |
| P(T<=t) two-tail | 0.70213005 | |
| t Critical two-tail | 2.045229642 | |

**Table 5: T-Test Results of (t−1), (t+1) Days**

| | *t-1* | *t+1* |
|---|---|---|
| Mean | 0.0014886 | 0.001620667 |
| Variance | 0.000783747 | 0.000800311 |
| Observations | 30 | 30 |
| Pearson Correlation | -0.220293811 | |
| Hypothesized Mean Difference | 0 | |
| df | 29 | |
| t Stat | -0.016452742 | |
| P(T<=t) one-tail | 0.493492939 | |
| t Critical one-tail | 1.699127027 | |
| P(T<=t) two-tail | 0.986985877 | |
| t Critical two-tail | 2.045229642 | |

As can be seen in the above images, in none of the windows is the p-value less than 0.05. This means that the null hypothesis cannot be rejected. Thus, it cannot be said that post M&A, the acquiring companies generate greater wealth for the shareholders. This is in line with the literature, which also states that because of paying excess premium, most of the abnormal returns are enjoyed by the target company, which is at the cost of the acquiring companies.

*H-3: Gain of Shareholders*

We cannot reject the null hypothesis and say that the gains for the acquiring company's shareholders are more in the short term than in the medium term.

Addressing the third hypothesis, as seen in the above tables, we observe that the shareholders of the acquiring companies do not stand to gain post M&A, in the short, as well as the medium term.

## IMPLICATIONS

Using the neural network model, we found that the acquiring companies overvalue synergy. The model that is built can be used by managers to determine the value of the target. When doing M&A transactions, companies have in mind the target financial ratios that they want to achieve in the future. Using those targets, companies can estimate the value of the target. There are a lot of non-financial factors, such as management competency, involved when valuing a company; however, this model can act as a benchmark and can give a fair idea of the value of the company.

In addition, we looked at the cumulative abnormal returns and found that the acquiring companies' shareholders do not gain anything post M&A. This shows that shareholders are not happy with the transaction and they feel that the transaction was not appropriate. So, this model, along with the shareholders' reaction to the M&A transactions, can act as a guiding light for the managers to understand where they are going wrong in the M&A deals, and how they can improve the same.

## CONCLUSION

The objective of the research is twofold: to understand if the companies are able to correctly measure synergistic gains, and whether those are reflected in the prices paid and whether the synergy that is claimed to be generated through M&A leads to wealth creation for the acquiring company shareholders. To understand if the synergistic gains can be measured and to address the first hypothesis, a neural network model is built. The model uses the change in financial ratios to predict the price of the target. We observed that the companies generally end up over-paying for the targets, often overestimating the synergy gains that the acquirers can generate. The model shows RMSE of around 14%, which can be considered a little higher in general; however, with the current dataset, it can be considered an acceptable level. To address the third hypothesis, CAR was calculated. It is observed that the acquiring companies do not generate additional wealth for their shareholders, and so, shareholders of the acquiring companies generally do not tend to benefit from the M&A, at least in the short and medium term.

So, through this study, we tried to understand the synergy valuation in mergers and acquisitions in the steel sector in India, where we began by understanding the concept of synergy and how we can value it. Then we tried to develop a model based on the literature and tried to see if shareholders gain or lose from the M&A, with the help of CAR.

## LIMITATIONS

One of the biggest limitations of this study is the lack of data. The mode built can be considered a good starting point to value synergy; however, to build a robust model, more data is required. Since the pace of M&A in India has recently picked up, there is not much data available; as a result, even after considering data of 19 years, only 30 transactions were available. By increasing the dataset, the model can be much more robust and the error can be reduced. The best thing about neural network is that more the data, better the learning, and so better the model. Given the limitations of the data, the CAR for target companies could not be calculated. By increasing the data size, the CAR for target companies can be calculated, and the performance of the acquiring and target companies can be compared.

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