The Impact of Merger and Acquisition on Value Creation: An Empirical Evidence

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Abstract. The aim of this paper is to examine the impact of post merger and acquisitions on value creation. The paper also analyses the impact of lagged synergy (a proxy of sales growth) on the post merger and acquisition (M&A) performance of acquiring firms. The study employs System Generalised Method of Moment model (System GMM) to the panel dataset of 64 Indian firms from 2012 to 2018 to determine the synergy impacts and value creation post merger and acquisition (M&A). The outcome of the study signs that mergers create positive value for post merger acquiring firms, and lagged synergy influences future synergies positively. The lagged dependent variable synergy (p-value is 0.000) shows a significant positive effect on dependent variable synergy, which indicates that previous year sales of the firm have a positive effect on future year sales. If the acquisition of firm post merger and acquisition (M&A) effectively absorbs acquired firm resources and digests nutrition from those resources, then the value can be created, and synergy can be achieved, or at least not damaged. Corporate managers, policy makers and regulators can lure significant conclusions from the outcomes of the study. This study for managers concludes that a strong view of possible synergies that can be accomplished through mergers, timelines and processes to achieve them, all of which will aid in the post merger integration process. This knowledge and understanding also helps to optimise the effect of lagged synergies. The results have also important consequences for academics and give impetus to further research. Future research can be undertaken by comprising premiums paid, cross borders mergers, hostile or friendly mergers that may shed some supplementary insights. This paper contributes to value addition in the literature of post M&A as it analyses value creation and effect of lagged synergy in terms of sales. There are limited studies that observed the relationship of value creation and merger and acquisition (M&A), especially in the context of Indian sectors; moreover, this paper takes into consideration different sectors viz. Manufacturing, Mining, Electricity, Construction, Service and Real Estate which gives a holistic view of Indian sectors.

Keywords: Merger and Acquisition (M&A) · Synergy · Value creation · Generalised Method of Moment (GMM) · Research & Development (R&D)

JEL classification: G34
1 Introduction

In the early 20th century, a multitude of waves of strategic mergers and acquisitions (M&A) resulted in significant restructuring of industries all over the world, and this has led to the attention of policymakers and scholars towards different disciplines (Bertrand and Betschinger 2012). The M&A market includes the economic cycle, and during this period, there has been a significant increase in M&A activity (Martynova and Renneboog 2008; Kim and Zheng 2014; Uzelac et al. 2016). These cycles are called “Merger Waves” (Langford and Brown 2004; Martynova and Renneboog 2008). M&A operations in fragmented industries are cyclical, guided by market movements, economies of scale, legislation, and shakeouts.

There has been turmoil in the financial market since the beginning of 2020. Since then, companies have been working in an unaccustomed M&A environment that remains to emerge. COVID-19 affects many facets of the transaction from strategy and targeting to integration and value creation if assessed from companies’ financial and operational angle. Companies are adapting and placing themselves in a stronger place to negotiate acquisitions, divestitures, and other deals all through a prism of value creation (COVID-19 and deals: A sudden shift in M&A dynamics, Pwc’s Deal Blog, April 2020).

The value created by transactions can be realized in different ways (Langford and Brown 2004; Rabier 2017) in the premise, the value can be created through synergies from productivity, the opportunities generated from the combination of two companies which has not been existed if two of them has been operating individually (Harrison et al. 1991; Capron 1999; Damodaran 2005). Even though having enormous literature, there has been disagreement M&A are either value creators or destroyers (Sirower and O’Byrne 1998; Eccles et al. 1999; Rashid and Naeem 2017). The issue of value creation through M&A deals are highly relevant - can the activity being observed be rationalised? The above issue has been addressed by investors in the market and academia. There are numerous studies that have examined M&A performance, and the research findings are generally not optimistic for the acquirer ‘s shareholders (Mousa and Restum 2020). The main reason behind the investment of shareholders in a company is to earn a profit to reap economic value through capital gains and dividends since it becomes necessary for the company to generate value for the shareholders. The lack of capital in the firm could indicate their liquidation in the market. It turns out that it is necessary to decide how and how much value is generated in a firm post-M&A.

Thus, the contribution of this study is two fold. Firstly, the study aims to contribute to existing literature on mergers and acquisitions, with the intention of exploring the impact of persistence of synergies on post merger synergies. The topic is addressed through the assessment of value creation, which is measured by synergy along with other financial indicators of company performance. Secondly, most of the empirical literature studies examined the success of M&A by event study methodology, accounting approach, and clinical approach from an acquirer or target angle (Agarwal et al. 1992; Gupta and Gerchak 2002). However, this study uses System Generalised Method of Moments (System GMM), a methodology that considers the unobserved firm heterogeneity, potential endogeneity, and serial correlation problems (Dickerson et al. 1997). Thirdly, this research problem is addressed very limited in the Indian context as compared to other countries.
like UK, US. To address these issues, this paper analyses the impact of lagged synergy with financial performance of company post Merger and Acquisition using System GMM methodology.

The article is broken down into seven parts. The literature is reviewed, and hypotheses is formed, indicating the potential effect of the independent variable discussed in the next section. In contrast, in the third section, the source of data used and research methodology have been stated. The section fourth discusses the econometric model of the study. Section fifth discusses the findings of the study. The last section summarizes the major findings and concludes with a discussion on implications; this section also highlights the shortcomings of the article and its scope for future research.

2 Literature Review

M&A is in a position to become a big anomaly in corporate restructuring and to succeed internationally (Vyas and Narayanan 2016) to become the most expeditious method of company development than organic growth (Gaughan 2015). Globally, the acquisition market is firmly proactive, with an average transaction size of $1 trillion per year (Berk and Peter et al. 2014). The term Merger and Acquisition are used interchangeably. As the statement (Bower 2001), “We know surprisingly little about mergers and acquisitions, despite the buckets of ink spilled on the topic”. The related literature is discussed in this section.

Mergers and acquisitions (M&A) transactions refer to all type of consolidation of companies or assets that involve the financial transaction. These transactions include mergers, acquisitions, consolidations, tender offers, purchase of assets and management acquisitions, but in all cases, two companies must be involved. The two transactions more common and more analysed worldwide, and therefore the name of M&A, are mergers and acquisitions (Ferrer 2019). As defined from a legal point of view (Ross et al. 2019), If a company wants to purchase another business it has up to three specific procedures: merger or consolidation, stock acquisition or asset acquisition. Firstly, both merger and consolidation occur when there is a full absorption of companies but the difference is that, on the one hand, the resulting company is the acquirer and the acquiring company ceases to exist in a merger while, on the other, both companies cease to exist in a consolidation phase and a new company is formed. Secondly, when an acquisition is done through purchasing stocks of the other firm, by exchanging them with cash, shares or other securities, it can be done, or at least started, by a private offer between managements or with a public offer called tender offer.

2.1 Theory of Value Creation

Value creation through an M&A transaction can occur in a multitude of ways (Langford and Brown 2004; Rabier 2017). Singh and Montgomery (1987) concluded that the acquired company generally benefit from the excess value generated by M&A. Value added can be achieved by generating synergies and efficiencies from the consolidation of two or more companies, which will not be established if the two companies operate separately (Harrison et al. 1991; Capron 1999; Damodaran 2005). The value creation
theory based on the assumption that value is the root cause and underlying predictor of the success of the company, considering value as the crucial factor not only obtained by shareholders but also by all stakeholders (Galofré Ferrer 2019; Sinkkonen 2019). Any transaction that induces an organization to expand, either in size, turnover, or market share, indicates creating of value (Galofré Ferrer 2019).

There is a multitudinous way for companies entering in M&A and creating value, as mentioned in literature. The study (Seth 1990) revealed five fundamental areas of value creation in M&As, i.e., economies of scope, economies of scale, market power, diversification, and coinsurance. From the shareholder’s point of view, there can be four major reasons for M&A, that are Efficiency Gains, Synergy Gains, Growth and Diversification (Roberts et al. 2012; Motis 2007; Depamphilis 2010; Gaughan 2015) and Strategic realignment (Gort 1969; Depamphilis 2010). The efficiency gains (Brealy 2010; Ross et al. 2010; Depamphilis 2010) include economies of scale, economies of scope, and economies of vertical integration with the rationale behind improving operating efficiency and reducing the cost of production. On the other hand, synergy gains include operational synergy, financial synergy, and managerial synergy (Martynova et al. 2006; Ross et al. 2010; Depamphilis 2010) leading to a reduction in production, capital cost and R&D. The consolidation of businesses at the merger level eliminates duplicate work by employees, imbricate activities, and consolidated operations to remove related tasks (Krishnan and Park 2002; Lehto and Bockerman 2008) that are intended to improve productivity by lowering costs (Rhoades 1998). It can be concluded that if the post M&A integration approach is successful, it can lead to efficiency gains in combination with the strength to conquer synergy success. The study by Li and Yu (2019) examines whether M&A creates value for Western European pharmaceutical acquirers from a short-term perspective and examined determinants of value creation. They concluded that short term value is created by M&A and there are three determinants of value creation which includes R&D intensity, total assets and current ratio. The aim of the study (Mousa and Restum 2020) is to analyse the effect of an M&A announcement on the valuation of the acquirer shareholders in the Swedish market and to find the determinants of the value creation in the acquirer stock prices. They concluded that both target and acquirer have positive CAAR value from M&A.

Value creation is an important issue for the financial sector as a whole and therefore it becomes important to be able to measure this. Many indicators are used to measure value creation, although they should be reduced to the truly reliable ones. The (Vernimmen et al. 2014) organised the most important value creation indicators into three different categories: accounting, economic and market indicators. The accounting indicators are Return on Equity ratio and Return on Capital Employed; economic indicators are Net Present Value and Economic Value Added; market indicators are Market Value Added, Total Shareholder Return and Abnormal Returns. The notion of synergy conforms with the efficiency theory. The theory of efficiency asserts that mergers and acquisitions create value through synergies. The research (Rozen Baker 2018) looked at possible trade between the two main objectives of M&A vis-à-vis. Synergy success and efficiency gains, and described a situation matrix such as win synergy win efficiency, high synergy low efficiency, and low synergy low efficiency and so on. He concluded that management needs to strike a balance between the two in order to gain future benefits from M&A.
Concisely, M&A may be regarded as beneficial if it contributes to synergy success along with efficiency gains, resulting in a dual improvement such as both profitability and revenue increases (Rozen Bakher 2018). Thus, in this study the value creation is proxied by synergy and synergy is measured by change in sales, which is also considered by study (Rozen Bakher 2018). In this paper, value creation is measured by synergy. In light of the arguments put forward in this part, the first hypothesis is as follows:

H1: The synergy has a positive effect on the financial performance of Acquirer Company.

2.2 Synergy (Persistence in Sales of Acquirers)

When it comes to more realistic studies, and M&A success evaluation by synergies through client survey and case studies examined if the companies have complied with the forecasted revenue and cost synergies. They inferred that, in large part, mergers could give rise to cost-related synergies. Still, there was a large variation in the revenue synergies, which is directly attributable to an estimation error. The (Sinkkonen 2019) underlines that examining synergy is a matter of great importance and use it as a measure of performance. The adaptability of the worldwide M&A market has projected high record levels of valuation that implies the presence of synergies (Kengelbach et al. 2018). The synergistic rationale behind following M&A is associated with acquiring firm optimistic wealth effects (Dennis and McConnel 1986; Berkovitch and Narayanan 1993; Andrade et al. 2001). The literature assumes that a Merger is successful or synergistic when there is an increase in the profitability of acquiring a firm (Barney 1988; Datta 1991; Lubatkin 1987). Therefore, if the company’s total value is equal to 5 and not 4, it is called a synergistic merger (Michel and Shaked 1985; Weidenbaum and Vogt 1987). The synergistic benefits are based entirely on the merged entity’s value creation, means the ability to combine the merged firm’s functions (Ghosh 2001) assessing M&A performance by synergy as its predictor can provide much more reliable estimates than the most commonly used estimator (Larsson and Finkelstein 1999). While examining the company’s’ operating performance post-merger, synergy gives a good approach to measure the variations in performance. Despite the enormous amount of literature, no consensus has been reached either consolidation increased operation performance (Powell and Stark 2005). M&As seeks to create synergy by merging two or more firms to maximize the competitive advantage which is expected to lead to a rise in the size of the market, resulting in the growth of the merged companies’ revenues. Synergy is an absolute substitute for assessing the performance as it gives a comprehensive view of the creation of value (Ferrer 2019).

Synergies are commonly understood to arise when two firms are able to produce greater profit for their respective shareholders by working together than independently. Mellem and Evans (2010) define it as “a combination of businesses which makes two plus two equals to five.” In addition, DePamphilis (2010) suggests that two forms of synergies can be differentiated, fundamentally, operational and financial.

\[ V(AB) > V(A) + V(B) \]

In this study, synergy is defined as a proxy of value creation (Seth 1990; Harrison et al. 1991; Ekkayokkaya and Paudyal 2019), whereas synergy is measured by the change
in sales. The synergy as the dependent variable is included to account for dynamic effects in performance. The existing literature concludes that the dependent variable could be influenced positively by previous ones; precisely, there is the persistence of sales (Moatti et al. 2015).

H2: Lagged Synergy has a positive effect on the current synergy of acquisition firm (there is persistence in the sales of acquirers).

2.3 Impact of Financial Performance Indicators

In the literati, it is legitimate that value creation takes place in M&A transactions through a complex mechanism driven by multiple company-specific and transaction-specific factors (Andrade et al. 2001; Ishii and Xuan 2014; Dutta and Jog 2009).

The Research and Development (R&D) Intensity of acquirer decreases due to a sharp increase in sales (Szucs 2014). In the presence of economies of scale and scope benefits, post R&D efficiency will be greater after M&A (Cohen and Levin 1989; Roller et al. 2000; Jovanovic and Gilbert 1993). Economies of scale and scope are an important factor in determining whether the larger scale induced by the M&A will lead to more or less R&D (Cassiman and Martinez-Ros 2003). When firms are involved in M&As for technology sourcing purposes then the impact of M&A on R&D is positive (Grandstand and Sjolander 1990; Chakrabarti et al. 1994; Capron et al. 1998; Capron 1999; Ernst and Vitt 2000; Ahuja and Katila 2001). The post-merger output of innovation improves because of technological synergy (Bena and Li 2014). Debt acts as a defensive cover for the acquired firm because it constrains the way for M&A (Hege and Hennessy 2010). A firm’s capital proportion of debt is an important factor through which value for shareholders is created (Agyei-Boapeah 2015). This could influence a crucial merger or acquisition decision (Hitt et al. 1997). The study (Jandik and Makhija 2005) affirms that shareholders of more leveraged firms (target) produce a perfect state of improved results and operations.

An acquiring firm with a higher level of liquidity is more capable of destroying value by overbidding (Martynova et al. 2006; Schoop 2013). The liquidity influences post M&A investments by limiting the discretionary resources a firm can expend without incurring additional debt (Elliott 1971; Grabowski 1968). The effect of liquidity on performance has been studied by (Yang et al. 2019; Betrand and Betschinger 2012).

The relative size between acquirer and target generally affects the integration process effectiveness (Martynova and Renneboog 2011; Homberg et al. 2009). The increase in firm size also contributes to economies of scale and leads to increased operational performance (Banerjee and Eckard 1998; Banker 2003). However, the study (Klimek 2014) concluded that firm size is related to operating efficiency in a negative way. There will be no dollar synergy gains for acquisitions by large firms, but there will be dollar synergy gains for acquisitions by small firms (Moellar et al. 2004). The size of the target company must be sufficiently large, or it will not positively affect the acquirer firm.

Every type of growth activity has an impact on the profitability of a firm (Dickerson et al. 1997). Prior research has made use of profitability ratios to measure growth in the firm’s profitability level (Papadakis and Thanos 2010; Betrand and Betschinger 2012; Zollo and Meier 2008). While analyzing the M&A factors (Dessyllas and Hughes 2009), it concluded that profitability is profoundly and substantially associated with the
company’s acquisition strategy. Narayanan (2004) also documented that firms reinvest their profit margins on innovative acquisition in the post-deregulation era in the Indian context. Andrade and Stafford (2004) have stated that profitability would not play a key role in the firm’s investment acquisition strategy, but it does have a positive impact on non-merger investment.

Tobin’s Q is used to assess value creation, growth expectation of firm (Carpenter and Petersen 2002), and post-merger performance of acquiring firm (Delcoure and Hunsader 2006; Adams 2008; Bris and Cabolis 2008; Kammler and Alves 2010). The low Tobin’s Q indicated that firms generally have little growth expectation, which means their counterparts may surpass them (Duflos and Pfister 2008). The firms with high Tobin’s should merge with the firm’s having low Tobin’s Q (Jovanovic and Rousseau 2002; Blonigen and Taylor 2000; Dessyllas and Hughes 2009).

The section above underlines that empirical research had used different firm attributes to assess the factors that determine M&A decisions. Researchers concentrate on pre-acquisition factors, and overlook that value is created in the post-acquisition process (Galofré Ferrer 2019). In this research, company attributes such as liquidity, size of the company, profitability ratio, R&D, market capitalization, debt-equity ratio, and Tobin’s Q are encapsulated as relevant factors that explain variations in M&A investment decisions amongst firms. A substantial amount of literature predicated the progress of mergers (Rahman et al. 2016), through event study, accounting-based approaches and the difference of value between the observed synergy and forecasted synergies (Fiorentino and Garzella 2015), while this study considers the impact of lagged variables that has a substantial impact on M&A determinants and future performance of acquiring firm.

3 Data and Methodology

This paper focuses on the Indian Companies Non-Financial Sector. Here the Non-Financial Sector complies with the definition of PROWESS IQ. PROWESS IQ divides the sector into two sectors- Financial Sector and Non-Financial Sector. The Manufacturing, Mining, Electricity, Construction, Service, and Real Estate are included within the non-financial sector. The reason behind the study of this sector is that it provides appropriate performance measures to examine post-merger value creation, i.e., synergy. The Prowess IQ database is used to identify all M&A that occurred in the event year, i.e., 2015, while the main database is Capitaline for all information on the financial performance of the company. The sample includes all BSE (Bombay stock Exchange, India) and NSE (National Stock Exchange, India) listed firms resulting in 302 sample firms. When it comes to the equity market in India, there are two big stock exchanges that enjoy the majority of the trading volume. One is the Bombay Stock Exchange, abbreviated as BSE, and the other is the National Stock Exchange, also known as the NSE. These are two of India’s largest stock exchanges and are among the largest in Asia, including Japan, China, and Hong Kong. Since all the companies have abortive to meet the criteria viz. availability of data, lack of data figures, and exclusion of firms that merge more than once in the same year, data has been filtered, and the sample consists of 64 firms have chosen for the study.

For India, 2015 has been a year in which the economy has started rebuilding itself. The GDP grew at an annual rate of 7.4% in the July to September quarter, putting it
firmly ahead of other major emerging countries. The reason behind the growth was the government’s unexpected decision in January to reform the approach of measuring the country’s GDP, and the Indian basket of crude oils plunged below $40 a barrel, resulting in far higher figures (Indian Economy Year in Review 2015). The main industries in 2015 were ITes, healthcare, energy, pharmaceuticals, e-commerce, and banking, and financial services. The economies of the U.S., Japan, and the BRICS nation all faced either a downturn or a slow growth that favoured India as foreign investors had restricted investment choices in the medium term despite the subdued economic perspective. The Reserve Bank of India (RBI) had already considered bank funding for M&As by establishing a leveraged buyout market, giving a major fillip to domestic M&As (M&A Landscape in India: What to Expect in 2015). Indian assets are likely to remain in sight as inbound and domestic M&As expand in alternative purchase funding from PEs and increased capital market activity on the back of growth. There is obviously an uptrend in both volume and value (2015 likely to be a big year for mergers and acquisitions: Experts, News 18 Business 2015). 

To isolate the effect of the M&A transaction on the value creation of the acquiring firm, three years post the M&A is compared to three years before M&A (period of study is from 2012 to 2018). The study used a multivariate analysis wherein the year of the transaction (i.e. event year 2015) it left out as it can be viewed as a transition time that is having a significant effect on accounting standards related to M&As (Beccalli and Frantz 2009). The measures of value creation (synergy) are regressed as a dependent variable, using a dynamic panel model with the System GMM estimation approach to account for possible endogeneity and heterogeneity.

### 4 Econometric Model

The econometric equation is:

$$ Syn_{it} = \alpha_i + \beta_1 Syn_{it-1} + \beta_2 RD_{it} + \beta_3 DE_{it} + \beta_4 Size_{it} + \beta_5 MC_{it} + \beta_6 Profit_{it} + \beta_7 LIQ_{it} + \beta_8 TobinsQ_{it} + y_t + \epsilon_{it} $$ (1)

The dependent variable is the Synergy of acquiring firm (i) at the time (t), which is a measured by change in revenue and operating expenses as a percentage of the sale. The coefficient of lagged revenue indicates the degree of persistence. The $\alpha_i$ defines the company fixed effects, which acknowledges the intrinsic differences between companies that result in unobserved heterogeneity, whereas; the $y_t$ defines the time fixed effects, which includes the effects of the business cycle and other time-specific events of company performance and $\epsilon_{it}$ is the error term.

The Ordinal Least Square (OLS) gives rise to the problem of a dynamic panel resulting in the problem of heterogeneity and endogeneity that has not been observed. The problem of autocorrelation is caused by lagged variables, which may depend on past disturbances, which are usually considered to be serially uncorrelated. The explanatory variables may be endogenous or predetermined. Endogeneity is likely to occur due to the presence of variables that can be jointly determined, meaning that the explanatory variable is correlated with $\epsilon_{it}$ and earlier shocks, but uncorrelated with $\epsilon_{i,t+1}$ and subsequent shocks (Bond and Windmeijer 2002). On the other hand, regressors may be predicted in
the sense that the explanatory variable is uncorrelated with $\epsilon_{it}$. However, they may still be correlated with $\epsilon_{i,t-1}$, and earlier (but not subsequent) shocks.

To consider for unobserved heterogeneity in OLS, the Generalised Methods of Moments (GMM) methodology was proposed by Anderson and Hsiao (1982) to differencing the data using two lagged differences or levels. After that (Arellano and Bond 1991) used differencing to eliminate the fixed effect bias in dynamic panel models, and which exploits further moment conditions in order to instrument for lagged variables along with allowing for instrumentation of other endogenous variables. This is termed as ‘Difference Generalised Methods of Moments’ (Difference GMM). The limitation of this method is that it does not go well with dummy variables and unbalanced panel data. To overcome this, the ‘System Generalised Methods of Moments’ (System GMM) was developed by (Arellano et al. 20195 and Blundell and Bond, 1998), adding the dependent variables in levels to the transformed dataset, differencing the instruments to make them exogenous to fixed effects. In this study, our data fulfils the necessary conditions. The study uses System GMM, which is earlier applied by (Bertrand and Betschinger 2012).

The various tests are carried out to assess the validity of the econometric model. The Sargan test (1958) is estimated for every regression, which identifies the over-identifying restrictions and instrument quality. The null hypothesis that the restrictions are over-identifying is valid. Rejecting the null hypothesis reveals the instruments valid and confirms the validity of the specific model. Arellano and Bond (1991) test serial autocorrelation of the first and second orders. If the error term is significantly uncorrelated, the disparity between residuals should be defined by a negative first-order serial correlation and the absence of second-order correlations.

**Table 1.** Definition of variable

| S. no. | Variables        | Description                                                                                      | Supporting literature                      |
|-------|------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------|
|       | **Dependent variable** |                                                                                                  |                                            |
| 1.    | Synergy ($\text{Syn}_{it}$) | Measured by a change in sales. It is a proxy of value creation                                  | Seth 1990; Harrison et al. 1991; Ana Cunha 2018; Ekkayokkaya and Paudyal 2019 |
|       | **Independent variable** |                                                                                                  |                                            |
| 2.    | Synergy ($\text{Syn}_{it-1}$) | Measured by a change in sales. It is a proxy of value creation. (Lagged variable)                | Seth, 1990; Harrison, 1991; Cunha 2018; Ekkayokkaya and Paudyal 2019 |
| 3.    | R&D Expense($\text{RD}_{it}$) | The R&D is used rather than R&D Intensity following the reason that observing effect is unclear whether it is created by numerator or denominator. (R&D Intensity is calculated dividing R&D expenditure with firm revenues) |                                            |

(continued)
Table 1. (continued)

| S. no. | Variables                  | Description                                                                                                     | Supporting literature                      |
|-------|----------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 4.    | Debt Equity Ratio (DEit)   | It is a proxy of financial leverage which is calculated as: Total Liabilities (sum of noncurrent liabilities and loans)/shareholders’ equity. A rising debt ratio infers higher payments which take away financial resources and reduces firm profitability. | Hitt et al. 1997                           |
| 5.    | Market Capitalization (MCAPit) | Market Capitalization refers to the total market value of outstanding shares of publicly traded companies.     |                                              |
| 6.    | Liquidity ratio (LIQit)    | It is a proxy of the Current Ratio calculated by dividing Current Assets with Current Liabilities.            |                                              |
| 7.    | Tobin’s Q(TQit)            | It is calculated by dividing Equity Share (Market Value) plus Preference Share and Total Debt with Total Assets (Book Value). | Carpenter and Petersen (2002); Park and Jang 2011 |
| 8.    | Firm Size (SIZEit)         | It is measured by the total assets of the firm.                                                               |                                              |
| 9.    | Profitability Ratio (PROFit) | It is measured by Return on Capital Employed (ROCE)                                                            | Vyas and Narayanan 2016                    |

5 Empirical Analysis and Discussion

This section discusses about the findings and discusses about their impact on variables of study.

Table 2 outlines that Synergy, the size of the firm, and Market Cap has more variation as their standard deviation is high, i.e., 4147.604, 6083.265 and 29639.82 and their means are 2278.827, 2389.036 and 4895.525 respectively. The outliers in synergy, firm size, and market capitalization are transformed through taking a natural logarithm. Whereas other variables R&D (Bertrand and Zuniga 2006), Debt Equity, Profitability, Liquidity (Bertrand and Betschinger 2012) and Tobins’Q exhibits a low variation, there are no outliers in these variables. The results are in line with existing literature (Table 3).

Ho: Panel contains unit roots
Ha: Panels are stationary
Table 2. Descriptive statistics

| Variable | Mean   | Std. Dev. | Min.   | Max.   |
|----------|--------|-----------|--------|--------|
| SYN      | 2278.827 | 4147.604 | 6.06   | 40627.54 |
| R&D      | 5.574484 | 27.21138 | 0.00   | 223.98 |
| DE       | 1.227143 | 1.80802  | 0.00   | 16.97  |
| SIZE     | 2389.036 | 6083.265 | 17.1   | 51613.63 |
| MCAP     | 4895.525 | 29639.82 | 0.00   | 340673.4 |
| PROF     | 13.96222 | 13.60198 | −15.59 | 82.78  |
| LIQ      | 1.087647 | 0.362833 | 0.16   | 2.54   |
| TQ       | 1.64832  | 2.948344 | 0.008526 | 41.62807 |

Source: Author’s estimation, 2020, based on data collected

Note: SYN (Synergy), R&D (Research and Development Expense), DE (Debt Equity Ratio), SIZE (Firm Size), MCAP (Market Capitalization), PROF (Profitability Ratio), LIQ (Liquidity ratio), TQ (Tobin’s Q ratio).

Table 3. Unit Root Test (Levin Li Chu)

| Variables | SYN   | RD    | DE    | Size   | MCAP  | PROF  | LIQ   | TQ    |
|-----------|-------|-------|-------|--------|-------|-------|-------|-------|
| z         | −13.6324 | −15.599 | −17.6812 | −33.3623 | −10.1251 | −150E+03 | −13.8186 | −23.8601 |
| p-value   | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  | 0.000  |

Source: Author’s estimation, 2020, based on data collected

To evaluate if the series stationary and has a root factor, the unit root test is used. The null hypothesis is that a unit root is in the series, and the alternative is that it is stationary in the series. From the above results, we can infer that the Levin Li Chu test rejects a unit root’s null hypothesis and accepts the alternative hypothesis that it is stationary in series.

The correlation matrix amid the variables is reported in Table 4. From the above, it can be inferred that there is a positive relationship between synergy and explanatory variables, whereas the same association is not found for Liquidity. Variance Inflation Factor is used to measure Multicollinearity between variables, which are explanatory. Multicollinearity occurs when two or more independent variables are approximately calculated in the model by a linear combination of other independent variables. According to Chatterjee and Price, 1988, VIF should be less than 10. If VIF value is more than 10 or less than 1, there is a problem of multicollinearity. From the table, it can be inferred that the multicollinearity problem in variables does not exist, as the value of VIF is low.

Table 5 infers the result of synergy with explanatory variables using the Panel Least Square Regression methodology. The results show that the R&D impacts on synergy are
Table 4. Correlation Matrix

| Variable | SYN | EFF | R&D | DE | SIZE | MCAP | PROF | LIQ | TQ | vif |
|----------|-----|-----|-----|----|------|------|------|-----|----|-----|
| SYN      | 1   |     |     |    |      |      |      |     |    |     |
| R&D      | 0.3613 | 0.0476 | 1   |    |      |      |      |     |    |     |
| DE       | 0.0503 | −0.0476 | −0.0604 | 1   |      |      |      |     |    |     |
| SIZE     | 0.7874 | −0.2107 | 0.3228 | 0.1094 | 1    |      |      |     |    |     |
| MCAP     | 0.372 | −0.1611 | 0.2231 | −0.0763 | 0.3761 | 1    |      |     |    |     |
| PROF     | 0.2705 | 0.4339 | 0.1478 | −0.2421 | 0.0261 | 0.1725 | 1    |     |    |     |
| LIQ      | −0.2275 | 0.1302 | −0.0628 | −0.274 | −0.1825 | 0.0768 | 0.1698 | 1   |    |     |
| TQ       | 0.084 | 0.1102 | 0.1143 | −0.0734 | −0.0803 | 0.2667 | 0.1601 | −0.0283 | 1 | 1.27 |

Source: Author’s estimation, 2020, based on data collected

significant. It indicates that higher R&D investment would lead to positive synergies. M&A reduces competition and provides benefits from economies of scale and scope in R&D, and R&D efficiency increases post-M&A (Cohen and Levin 1989; Roller et al. 2000; Cassiman and Martinez-Ros 2003). The explanatory variable size, though, has a negative coefficient but substantially impact synergy. The organization’s similarity in terms of size plays a significant role as the relative size of companies in an industry/sector is significant for strategic propensity and profitability (Galofré Ferrer 2019). The profitability has a positive and significant on synergy. The key reason a shareholder invests in a company is to make a profit, obtain an economic benefit through capital gains and dividends (Galofré Ferrer 2019). However, liquidity has a negative coefficient relative to synergy, but it has a major synergy effect. Liquidity affects investment decisions by restricting a company’s financial capital in a given timeframe without recouping additional debt. Market capitalization shows a positive and significant impact on value creation. The Tobins’Q shows an insignificant effect on synergy neither has a positive relation with synergy, also indicates a slow growth for acquired firm. Hence, hypothesis 1 proves to be true as value creation significantly impacts positively variables of study.

Since F-statistics is 20.38 and significant, the inference is that the overall model fits well. Similarly, the model’s adjusted R-square is 35.18, which means the explanatory variable explains 35% variability of dependent variables. Therefore, model predictability is satisfactory.

In the existing literature, numerous reasons have been discussed as to how a business could improve its output through M&A, such as synergies (Larsson and Finkelstein, 1999), economies of scale and scope (Pangarkar and Lim, 2003), and greater market concentration (Ikeda and Doi 1983; Lubatkin 1983; Sharma and Ho 2002). The role of M&A is to serve the company’s needs and strategic objectives (Doherty et al. 2016).

The lagged dependent variable synergy shows a significant positive effect on dependent variable synergy, which indicates that previous year sales of the firm have a positive effect on future year sales. The reason behind synergistic effects may be due to the market responds instantly to new information about the company because investors considered that it might obtain high potential synergistic effects from the consolidation (Muganhu 2016). Hence, hypothesis 2 is accepted.
The size has a significant effect on value creation. The acquiring company merges with familiar targets and mostly in their territory, thus allowing them to minimize any adverse impact of size in obtaining synergies post-M&A. (Morck et al. 1990; Shelton 1988; Martynova et al. 2007). (Moeller et al. 2004) dollar synergy gains exist for small firms’ acquisition as compared to large firms whereas (Healy et al. 1992) and (Martynova et al. 2007) is of view that large firms are likely to give operating and financial benefits, leading to a greater increase in productivity compared with smaller targets (Healy et al. 1992; Martynova et al. 2007). (Gorton et al. 2009) inferred that size generates possible synergies and increases the odds of future mergers to create value, with larger targets becoming more partners that are attractive provided economies of scale.

The explanatory variable liquidity concludes the positive and significant impact on value creation. The impact of liquidity can be associated with the accessible surplus financial resources that can be utilized both for the firm and for managerial purposes (Betrand and Betschinger 2012). The observation of (Basu et al. 2008) concluded that

### Table 5. Panel Least Square regression

| Variables | SYN     |
|-----------|---------|
| R&D       | 0.3279346 |
| DE        | 0.0984255 |
| SIZE      | -0.30465  |
| MCAP      | 0.1195108 |
| PROF      | 0.0279625 |
| LIQ       | -1.001413 |
| TQ        | -0.0194179 |
| Coeff     | 6.971291  |
| R-squared | 0.3700    |
| Adj R-squared | 0.3518 |
| F-stat    | 20.38    |

Source: Author’s estimation, 2020, based on data collected
target firms broadly have greater liquidity, growth, and size. Still, less risky, leverage, profitability, and operational efficiency, however supporting the supposition that purchases are a mechanism for improving market share, synergies through economies of scale, reduction in capital costs, and increase in debt capacity, among others.

The insignificant effect of R&D on value creation indicates that post-M&A companies reduce their R&D expenses when heading M&A. (Blonigen and Taylor 2000; Dessyllas and Hughes 2009; Ornaghi 2009). Their studies concluded that acquiring an

Table 6. System GMM

| Variables        | SYN          |
|------------------|--------------|
| Logsynergy L1.   | 0.862324     |
|                  | (0.000)      |
| R&D              | 0.0301855    |
|                  | (0.552)      |
| DE               | 0.0257373    |
|                  | (0.556)      |
| SIZE             | 0.0637045    |
|                  | (0.089)      |
| MCAP             | 0.1099784    |
|                  | (0.000)      |
| PROF             | 0.002585     |
|                  | (0.453)      |
| LIQ              | 0.5588693    |
|                  | (0.000)      |
| TQ               | -0.0097708   |
|                  | (0.430)      |
| Constant         | -0.164025    |
|                  | (0.725)      |
| Wald Chi2 (8)    | 413.47       |
|                  | (0.0000)     |
| Sargan Test chi2 (19) | 25.99854  |
|                  | (0.1302)     |
| AR (1)           | -2.068       |
|                  | (0.0386)     |
| AR (2)           | 1.1587       |
|                  | (0.2466)     |

Source: Author’s estimation, 2020, based on data collected
R&D intensive firm would lead to the source of value creation for acquirers (Barney 1988; Goold and Campbell 1991; Harrison et al. 1991). The debt-equity has a negative effect on the value creation of the acquiring firm, which indicates that companies mostly finance their assets with debt, and from supplementary financing during the acquisition process that may lead to significant underperformance in future (Dickerson et al. 1997).

The Tobin’s Q is insignificant, which is not in line with (Khatab et al. 2011; Kammler and Alves 2010) study. Concerning value creation, the successful mergers are those in which a high Tobin’s Q firm merges with low Tobin’s Q company (Servaes 1991) and this indicates that acquisitions are used as an approach to offset for low organic growth opportunity (Duflos and Pfister 2008). The profitability ratio has a negative impact on value creation (Caves 1989; Hogarty 1970; Meeks 1977), the reason may be firm becomes less competitive in the short run after a merger shock and this adverse effect can be more serious if the company engages in the more regular merger. This finding implies that its merger strategies can affect the pace of firm resilience to a merger shock.

Market capitalization also shows a positive and significant impact on value creation. The results are in line with previous studies. Investors tend to foresee the operations of large firms, those with high market capitalization (Cai and Vijh 2007). So, these create less value than operations by smaller firms, whereas (Chalençon et al. 2016) conclude the negative impact of market capitalization on M&A.

The Sargan test with p-value 0.1302 shows no problem of over-identifying restrictions, thus rejecting the null hypothesis. Whereas the Arellano Bond test shows there is a first-order correlation as the p-value is 0.038, thus accepting the null hypothesis and AR (2) shows there is no second-order correlation as the p-value is 0.246, thus rejecting the null hypothesis, therefore satisfies that error term is significantly uncorrelated.

The challenge faced by any management is being able to generate value for the shareholders. The main of M&A is the value creation resulting from synergies. Synergy is an ex-ante measure widely used to execute a deal. From the above it can be concluded that the post merger the acquiring firm creates synergies due to consolidation of a both firm and also have a positive impact on market size, market capitalisation and liquidity. It can also be inferred that the lagged synergies have a positive impact on merger and acquisition and the explanation behind this effect could be that investors expects that the M&A will capitulate significant returns. Concisely, if the acquisition of firm post-M&A effectively absorbs acquired firm resources and digests nutrition from those resources, then the value can be created, and synergy can be achieved, or at least not damaged.

6 Concluding Observations

The findings documented in this paper mark a landmark in the existing literature on acquisition advantages and, according to the neo-classical M&A theory, oppose the traditional philosophy that the acquisition of firms destroys the value of shareholders far more often than it creates. The study focuses on whether the value is created in acquiring company post-M&A and analyses the impact of lagged synergy on future synergy with an improved research methodology System GMM was developed by Arellano et al. (1995) and Blundell and Bond (1998).

Firstly, it considers the impact of lagged synergy, which shows a positive and significant impact on future synergies. Synergies ensure a substitute and integrated view
of post-M&A performance. In addition to the synergistic performance metric, the company’s motivation behind the transaction and strategic rationale prove to be an effective tool for assessing the value added in the company. The gains from synergy have been increased more than 3 times relative to the last 20 years (Alexandridis et al. 2017).

Secondly, our evidence suggests that the higher acquisition gains can be at least partly explained by the variation in indicators of financial performance. R&D has a negative relationship with value creation, and the reason behind may be that R&D findings are extremely non-proprietary due to imitation or knowledge spill-over of R&D findings (d’Aspremont and Jacquemin, 1989). If this is indeed significant, a merger might help internalize the R&D benefits among the participating firms, thus creating an increased R&D incentive. Furthermore, it can be concluded that size, liquidity, and market capitalization are important determinants in the creation of value and performance improvements post-merger.

Thirdly, the justification for using accounting-related metrics to assess post-M&A performance is focused on the premise that most transactions are aimed at achieving higher results for combining firms, and this synergy between firms is better observed by considering long-term accounting indicators such as asset returns (Hitt et al. 1997; Thanos and Papadakis 2012). Thanos and Papadakis (2012) concluded that one of the primary motivations of M&As is to maximize the possible synergies between the merging companies and many of such synergies likely to take years to realize. Moreover, the performance of M&A can be seen over a period in accounting-based metrics. Authors have also argued that using several tests in a single analysis gives the post-M&A outcome a more holistic view (Thanos and Papadakis 2012).

Fourthly, this paper contributes to value addition in the literature of post-M&A as it analyses value creation. There are few studies, which observed the relationship of value creation and M&A, especially in the context of Indian sectors. This is because current paper takes into consideration different sectors viz. Manufacturing, Mining, Electricity, Construction, Service and Real Estate which gives a holistic view of Indian sectors.

This study concludes a multitude of implications for managers. The managers involved in the M&A mechanism cannot anticipate all the problems that are likely to arise during the integration phase of the agreement (Slangen 2006; Very and Schweiger 2001). Businesses considering acquisitions must set the synergy agenda at the top of the management boards and executive boards. Managers responsible for business growth, acquisition, and integration have a clear vision of how these potential synergies can be achieved, the timeline and process for achieving them, and when all this is taken into account not only in the valuation but also in the post-merger integration process. Thus, the impact of lagged synergies can be maximized. Targets selected that have capabilities complementary to those held by the acquiring firm provide the greatest opportunity for synergy creation. Acquisitions that provide new knowledge to the acquiring firm that can be used to enhance its competitive position often create value.

The M&A offers the acquiring firm new expertise that can be used to improve competitive position and creates value. The knowledge acquired from acquisitions can improve technological advancement if the target firm has complementary science and technology to the acquisition firm. In times of crisis, such as the COVID-19 pandemic, it is suggested that managers could still perform well by focusing on domestic firms
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for M&As. This is because managers can anticipate business environment crisis and strengthen their core capabilities and can avoid redundant mergers.

The current study has certain limitations. The companies selected in this study are strictly limited to publicly listed companies. The other financial indicators of the company in the form of an independent variable can be added to enhance the reliability of findings. The lagged variable synergy can be included with different periods, i.e., t-1, t-2, t-3, and so on, that will help in assessing the trend of lagged synergy on future synergy. The results have important consequences for managers, academics, and give impetus to further research. Further research on premiums paid, cross borders mergers, hostile or friendly mergers, and payment approaches focused on M&A may be taken to know the support theory, academic work, and practice.

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