Growing through M&A: Impact Analysis of Acquisitions in IT Industry

Mayank Mathur

To understand the performance of firms post-M&As an empirical study is done using a derived regression model based on the financial and firm level economic data for the leading IT / ITeS industries. The effort is to determine the relationship of the M&As to the firm's profitability. This study arrives at a model to determine the effect of M&As on the economic factors like ROA and CAR of the firms. The evidence is to support that M&As are not a solution to the financial distress in corporate organizations. The research revealed that while M&As can drive profitability in some organizations, operating efficiency suffers at least in the short-term in the post- M&A corporate entity.

Mayank Mathur is Executive Fellowship Program in Management Scholar, IIM Lucknow. E-mail:efpm02011@iiml.ac.in

Introduction

Enterprises normally grow through internal or external expansions. The internal or organic expansions deal with growing either vertically in a sector to improve on the market capture, or horizontally in related or even unrelated sectors, to tap the untapped sectors and grow the overall revenues. The external or inorganic expansions are mainly related to combinations of the corporate and businesses. This could be achieved by an integration between the two (or more) businesses to come out with a newer proposition in the market (mergers) or by simply acquiring a business and running under the same umbrella as other businesses (acquisitions).

The business decision on expansion either way lies in the overall vision and strategy of the businesses. Many times it all comes to a decision point whether to "make" a product or a solution internally versus "buy" the same from the market. Apart from the ongoing business strategies of the organization, there are decisions which should be based on a pure "return on investment" basis. An analysis including the trend analysis, fore-

casting etc. of these strategic moves play a key role in the decision making.

Literature Review

Mergers and acquisitions (M&A) and corporate restructuring are a big part of the corporate finance world. Every day, the investment bankers across the globe arrange M&A transactions, which bring separate companies together to form larger ones. There are several studies on this area, discussing about various theories. Baldwin and Caves (1990)examined trends in added value per worker between 1970 and 1979 in the Canadian and US corporations that had been the object of mergers or acquisitions during that period. They concluded that changes in control were followed by improvements in productivity. Tarasofsky and Corvari (1991)believe that corporate profitability remains, at best, unchanged after acquisitions and, in many cases, diminishes. The summary of the paper suggests that takeovers improved profitability in only about 40 percent of cases and in the others, profitability remained, at best, unchanged, but usually declined.

Shantanu Dutta and Vijay Jog (2009) investigated the long-term stock return performance of Canadian acquiring firms in the post-event period by using 1300 M&A events in the 1993 - 2002 period. They concluded that there are no significant long-term negative abnormal returns for Canadian acquirers. Ingham, Kran and Lovestam (1992) inferred from their research that, to assess the effects of mergers, it is necessary to determine how their impact is to be measured. The two criteria identified by them are accounting measures of profitability and the share price.

Holmstrom (2001) examined changes in the merger activity and corporate governance mechanism in the US. He concluded that there is a rise in merger and acquisition activity for the period 1980 until 1999 and that the corporate governance mechanism has evolved from leveraged hostile takeovers and buyouts in the 1980s to incentive-based compensation in the last portion of the 1990s. Altunbas and Ibanes (2004) provided evidence that bank mergers in Europe resulted in an improvement in the companies' return on capital, particularly on cross-border mergers, because of organizational and strategic fits. They found out that the improved performance can primarily be attributed to the broad similarities between merger participants.

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Mantravadi and Reddy (2008)found empirical evidence that, overall, companies in India are experiencing slight increases in their profitability following the merger or acquisition. However, the impact is different when different industries are considered in isolation.

Many information technology (IT) specialists agree that the software industry has entered a phase of maturity in the last few years. Leger & Quach

(2009) studied the impact of the characteristics of software product portfolios on the performance of firms involved in a merger of software companies. Their study showed that markets generally seem to neglect the characteristics of software product portfolios when the merger is announced. They add that beyond the traditional antecedents the performance of combinations of software companies should be positively impacted by the virtual network effects that result from the compatibility and complementarity of the new entity's software products. The impact of these two factors on the short-term market performance of both the entities' stock at the time of the announcement on the value of the transaction and on the long-term financial performance of both entities needs to be considered when measured alongside the impact of more traditional variables.

Many authors have studied the factors influencing the performance of business combinations (Brouthers et al., 1998; Lehto & Lehtoranta, 2004; Seth, 1990). Taken together, these studies suggest that the main performance antecedents relate to four factors justifying the combination's economic potential: the potential for market growth, the potential for economies of scale, the potential for economies of scope, and the potential to acquire competencies.

Carlaw and Lipsey (2002), derive that the two Information Technology based products are complementary when their joint use adds more value for the customer than the sum of the separate use of the same products. Prabhu et al. (2005) state that, for acquisitions to promote innovation, firms must first engage in internal knowledge development. Bannert and Tschirky (2004) also concentrate on the importance of internalizing external knowledge, and identify the lack of integrative decision-making, of systemic processes and of a holistic change of both companies during the integration as the main causes of failed acquisitions. Paruchuri et al. (2006) take these results one step further by hypothesizing that the productivity of corporate scientists at acquired companies is generally impaired by integration, due to the loss of social status and centrality in the process. This can be assumed to be particularly true of technological firms. Tsai and Hsieh (2006) claim that the application of ''two-stage grey decision-making'' can assist corporations in selecting technological assets to create wealth through mergers, whereas Haro-Dominguez et al. (2007) find that the degree of ''absorptive capacity'' has a positive influence on both internal and external acquisitions of technology.

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Among the recent studies Singh (2016a) observed that the first step that drives the target of M&A is technology transfer/ spillover where acquirer can evaluate the strength of its acquiree by transferring its expertise and closely

watch how acquiree performs over the time. Singh (2016b) exhibited how IT is driving mergers and acquisitions and promoting growth of the firms. Finally, Singh (2016c) carried out a comprehensive study by examining more than 70+ papers in foreign ownership and analyzed how it impacts on the firm's growth. He observed, in majority of the cases, the foreign ownership promoted productivity/ profitability except in the cases of family owned business where foreign aid failed to elevate the risk appetite.

Research Problem

The sudden increase in M&A transactions between developed and developing countries and among themselves has been based on different objectives varying from enterprise to enterprise. While synergies are often mentioned as one of the main arguments for combining two entities, research body work found much more. Some of the research papers have tried to differentiate their findings on M&A's transactions between upstream and downstream seeking capabilities. With the objective of the realization of synergies in mind, this leads us to the main problem: do these M&A add value and, are they sustainable? Additionally, this paper attempts to answer a few questions: first, what is the effect of post-merger and acquisition on the general performance of the organization? Is there any effect of merger and acquisition on stakeholders of the organization? What is the effect of merger and acquisition on corporate profitability?To comprehensively understand the above problems, it is important to understand the conceptual framework and developments of M&A, value creation, and synergies.

Data Source

The data used here are mainly from the financial and statistical data collected from CMIE Prowess Databases for select IT and ITeS companies across the globe and various sub-sectors. Some of the data points have also been picked up from Institute of Mergers, Acquisitions and Alliances (IMAA) databases. The data largely cover the period 2006 to the beginning of 2014. The two databases used also provide some characteristics of the target and acquiring firms such as name, industry sector, transaction history etc. The data are used to give some clarity on how M&A investments impact respective organizations and the IT sector. Some of the relevant information and statistical data are collected from the online publications. Other sources of data are collected from the investment websites like moneycontrol.com, indiainfoline.com, websites of the BSE and NSE etc.

Methodology

To measure the performance changes for a firm after acquisition, there is a need to define a few criteria for the same. For instance, one approach to measure the performance is to look at the financial performance aggregated over a period coinciding with the mergers/ acquisitions. Studies mention various other variables for determining the performance of the firms. As Schoenberg (2006) mentioned, one of the most appropriate parameter for this is cumula-

tive abnormal returns (CARs). Meeks and Meeks (1981) compared three main performance accounting criteria: Profit/ sales ratio, return on equity and ROA. Singh (2016c) mentioned productivity as an important criterion; however we need to discount this to focus only on financial measures to stay relevant to the objectives of this paper.

Research concluded that the return on assets (ROA) is the most appropriate financial ratio for measuring M&A performance.

Research concluded that the return on assets (ROA) is the most appropriate financial ratio for measuring M&A performance. The ratio ROA is widely used in the M&A literature, (Ramaswamy, 1997; Zollo & Singh, 2004). The reason being that it is influenced relatively less compared to other financial criteria, by the possibility of upward or downward estimation bias caused by changes in the overall bargaining power resulting from a merger or the acquisition.

Return on Assets (ROA)

Return on assets is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. It is determined by dividing a company's annual earnings by its total assets. ROA is displayed as a percentage. Accounting based measures like ROA are relatively better indicators for a firm's performance post acquisitions. Papadakis and Thanos (2009) concluded that ROA is the most appropriate ratio for measuring M&A performance as it is influenced less compared to the other criteria by the possibility of upward or downward estimation bias caused by changes in leverage or bargaining power resulting from a merger.

The research by Papadakis and Thanos (2009) and Singh (2016c) suggests that post-acquisition returns should be compared with pre-acquisition returns. The basic methodology behind such studies is to compare the weighted average of the pre-bid returns of the target and the bidder firm to the reported post-merger returns of the combined firm. Data have been gathered for each acquisition that happened over the span of 3 years, during 2009 to 2011 in the IT/ ITeS applying the measures replicated from the study of Papadakis and Thanos (2009). A time frame of 2 to 3 years is typically chosen here, based on the study by Papadakis and Thanos (2009) that the first 2 to 3 years of an acquisition are important as well as sufficient for the completion of the integration process. A similar observation was made by Singh (2016c) in terms of timelines.

The decision to choose this time frame was also driven by the fact that most of the acquisitions took place during 2009 to 2011, which turned out to be the revival period post-recession in the IT industry. The ROA was also adjusted for the IT industry effects and excluded from the analyses the year the acquisition took place, following previous researchers (Meeks & Meeks, 1981;

Ramaswamy,1997). The research is in line with the one by Papadakis and Thanos (2009), for the usage of ROA to determine the performances of the firms, their model has been used to determine the ROA. The model used is expressed as follows:

$$\Delta ROA = (ROA_{t+2} - ROA_{s,t+2}) - (ROA_{t-2} - ROA_{s,t-2})$$

Here,

ROA_{t+2} and ROA_{t-2} represent the asset-weighted mean of the ROA of both a target and some bidder firm 2 years after (t+2) and 2 years before (t-2) the acquisition.

$ROA_{s,t+2,}$ $ROA_{s,t-2}$ stand for average industry ROA 2 years after and 2 years before the acquisition respectively. The analysis is straight forward after that. If the change in ROA is positive the acquisition is considered to be successful, while the opposite is the case if ROA is negative.

Cumulative Abnormal Returns (CARs)

The other main parameter to be regressed and determined to make a decision on performances of the firms is the cumulative abnormal returns (CARs). CAR is defined as the sum of the differences between the expected return on a stock (systematic risk multiplied by the realized market return) and the actual return often used to evaluate the impact of news on a stock price. The chosen model in a simplistic view would be defined as follows, which mainly represent market and risk adjusted model:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})_i$$

Where,AR_{it} is the abnormal share price return of acquiring firm i on day t,

R_{it} is the observed share price return of acquiring firm i on day t,

α_i is the market model constant for acquiring firm i,

β_i is the beta of acquiring firm i

R_{mt} is the return on the market portfolio on day t.

Coefficients α and β need to be estimated as in Schoenberg's (2006) study over a given period. Abnormal returns as a result of the acquisition announcement were determined by subtracting the expected share returns from the actual returns. To determine the other related parameters and arrive at a conclusion for the profitability and performance of the firms post M&A, there are various distinct approaches identified to measuring acquirer abnormal returns (Banerjee et al., 2014). As the methodology used by Banerjee et al. (2014) in their research is also in line with our research, similar models have been used here. We have cited them as and when we used a model from their study. The three broad studies which have been used for determining the CARs for a given set of data, are as follows:

Standard Event Study (Brown & Warner, 1985) is defined as the cumu-

lative abnormal return during a 5-day period centered on the announcement date of the acquisition. The 200-trading day estimation window ends 6 days before the announcement of the merger. One-factor market model has been used to estimate the stock-specific event study parameters. At least 30 daily returns are required to be available during the estimation window. The data have been picked up directly from CMIE Prowess Database. Specifically, the cumulative abnormal returns for the (-2,+2) event window around the announcement date are calculated as:

$$CAR(-2,+2) = \Sigma(R_{it} - (\alpha_i + \beta_i . R_{mt})$$

Coefficients α and β need to be estimated as in Schoenberg's (2006) study over a given period.

GARCH Model: The cumulative aggregated returns, CAR (-2, +2): AR(1)/GARCH(1, 1) is defined as the cumulative abnormal return during a 5-day period centered on the announcement date of the acquisition. The data have been picked up directly from CMIE Prowess Database. The model of expected returns is based on de Jong et al. (1992). We require at least 30 daily returns to be available during the estimation window. This is derived by extending the above mentioned standard event study model with AR(n) time-dependent beta and a GARCH(i, j) variance structure. de Jong et al. (1992) shows that the AR(1)/GARCH(1,1) results are robust to violations of the assumptions of homoscedastic normal distribution. Review of published research for acquiring firms indicates that none of them uses AR(n)/GARCH(i, j) model of expected returns. de Jong et al. (1992) estimate AR(1)/GARCH(1,1) model of expected returns for each firm as follows:

$$Rt=\beta t.Rmt+\gamma 0 + \gamma 1.Rt - 1 + et + \gamma 2.et -1\ et\sim(0,hi)$$

$$\beta t - \beta = \varphi(\beta t-1-\beta) + \xi t, \xi t\sim(0,\sigma 2\xi)$$

$$ht-\sigma 2=\alpha 1\ (e2t-1-ht-1) + (\alpha 1+\alpha 2)(ht-1-\sigma 2)$$

All the above parameters are the estimated ones.The data start 300 trading days prior to the announcement date and end 300 trading days after the same date to estimate the model.

*Dimson (1979) Beta Model of Expected Returns:*The cumulative aggregated returns, CAR (-2, +2):Dimson's Beta is defined again as the Cumulative abnormal return during a 5-day period centered on the announcement date of the acquisition. The data have been picked up directly from CMIE Prowess Database. The model of expected returns is based on Dimson (1979). Returns on the Indian Sensex Index are used as the market return. This estimation is particularly applicable in situations characterized by infrequent trading. Since stock trading of some firms in some developing markets can be at times characterized as infrequent, we follow Dimson (1979) and estimate the following expected return model for each firm in our sample:

$$Rt=\alpha+\beta t-1.Rm,t-1+\beta t.Rm,t+\beta t+1.Rm,t+1+et$$

According to Banerjee et al (2014), the parameters of Dimson model are estimated over the same window as for the prior two models, namely (-300,-30) relative to the announcement date of the acquisition.

In IT and ITeS the failure rate of M&As ranges around 60%, which is higher than the failure rate of 50% defined as a standard across the M&A.

ROA & CARs: Analysis & Correlation

Table 1 reports the means, standard deviations, failure rates and Pearson's correlations for all variables assessed in the study. A simple test has been done to determine the mean and standard deviation, along with the average rate of failure. The Pearson's Correlation is for determining the high-level relationship between the ROA of an acquisition and the cumulative abnormal return resulting from the acquisition. The findings very clearly show that in IT and ITeS the failure rate of M&As ranges around 60%, which is higher than the failure rate of 50% defined as a standard across the M&A. In addition, except for a positive relationship between ROA and managers' subjective assessments there was no statistically significant correlation between the other criteria, providing support to Schoenberg's (2006) findings.

Table 1 Means, Standard Deviations, Failure Rates & Pearson's Correlations for Variables Included

Variable	Mean	St. Dev.	Failure Rate	ROA	CARs
ROA	-0.017	0.14	0.689	1	
CARs	-0.025	0.21	0.572	0.19	1

This result is in line with the expectation based on the tenure chosen in the study of the post-recession period, which was more of a revival period and an acquisition or a merger may not have been helpful in the longer run during those years.

Uni-variate Analysis

The univariate results in Table 2 could be explained by factors known to affect acquirer announcement returns. Specifically, the average CARs for each of the three time, and the change in CAR is identified for the three years, conditioned on characteristics previously shown to affect acquirer announcement returns. The analysis shows that during 2011 period, the CARs to acquirers of subsidiaries are negative. Acquisition of assets from governments under privatization plans appears to be consistently profitable but statistically insignificant for acquiring firms.

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Table 2 Uni-variate Analysis of Acquirer CAR (-2, +2)

		2009	2010	2011
	N	*70*	137	173
$ (in million) and % negative CAR				
Standard Event Study	Sum	94332	1013546	305757.3
	Average	1347.6	7398.14	1767
	% Negative CAR	17	16	17
AR(1)/GARCH(1,1)	Sum	93547	997649	298658
	Average	1336	7282.1	
	% Negative CAR	12	13	13
Dimson Beta	Sum	92543	997762	267437
	Average	1322	7282.3	1545
	% Negative CAR	11	13	12

Empirical Results

Regression analysis based on Banerjee et al. (2014), the model derived earlier has been executed with the given data. Regression has been done in Tables 3 and 4 which summarize the change in the CAR post-acquisition and the impact of the same on the salient financial parameters.

The results reported with the scenario that the (-2, +2) event window CARs are regressed against target and acquirer deal characteristics used in prior literature. Specifically, for target characteristics we include indicators for whether the target was public or private, whether the acquisition was friendly, relative size of the target, deal value, indicator for whether cash was the mode of payment

Table 3 Regression Analysis of Acquirer CAR (-2, +2): Part 1

	1	2	3	4	5
Intercept	3.51(0.096)	2.12(0.561)	1.73(0.832)	2.21(0.43)	3.34(0.21)
2009		0.42(0.054)	-0.12(0.465)		
2010				-2.97(0.017)	-2.85(0.018)
2011			4.76(0.72)	3.21(0.43)	
log(Total Assets)	-0.62(0.040)	-0.65(0.061)	-0.38(0.743)	-0.90 (0.877)	-0.82(0.713)
Cash/Total Assets	-0.53(0.040)	-0.98(0.061)	-0.63(0 673)	-1.1 (0.737)	-0.42(0.054)
R&D/Total Assets	-0.91(0.040)	-0.72(0.061)	-0.42(0.903)	-0.12(0.63)	-0.92(0.749)
Adjusted R-squared	0.125	0.15	0.13	0.16	0.43
Observations	385	385	385	385	385

CAR (2, +2) is winsorized at the 1% and 99%. Unless otherwise indicated, all accounting variables are measured at the fiscal year end immediately preceding the announcement date.
Values in brackets represent t-test values at a significance value of 95% across the whole regression cycle

for the acquisition etc. We include log of total assets (or log of market value of equity one quarter prior to the acquisition), Q, PBIT to total assets, leverage, cash to total assets, etc. We perform 5 different regressions on the sample data

Table 4 Regression Analysis of Acquirer CAR (-2, +2): Part 2

	(1)Standard Event Study	(2)Standard Event Study	(3)Standard Event Study	(4)AR(1) / GARCH (1,1)	(5)AR(1) / GARCH (1,1)	(6)AR(1) / GARCH (1,1)	(7)Dimson Beta	(8)Dimson Beta	(9)Dimson Beta
Intercept	3.51			0.43			0.52		
	(0.096)			(1.32)			(0.97)		
2009	-0.25				-0.54			-0.38	
	(0.049)				(0.74)			(1.18)	
2010		-0.65							
		(0.021)							
2011			-3.17			-2.1			-3.13
			(0.022)			(0.28)			(0.03)

CAR (2, +2) is winsorized at the 1% and 99%. Unless otherwise indicated, all accounting variables are measured at the fiscal year end immediately preceding the announcement date.
Values in brackets represent t-test values at a significance value of 95% across the whole regression cycle

and run the analysis to get the following results. We also compare the coefficients on the variables of interest related to time using the CARs based on the standard event study with those based on AR(1)/GARCH(1,1) and Dimson beta models explained earlier.

The data above represent the three models being regressed over the three different periods of time – 2009, 2010 and 2011. The results reported in Tables 1 to 4 demonstrate a decline in the profitability of acquisitions for shareholders of acquiring firms. The declining trend in acquirer announcement returns is robust to the inclusion of standard control variables used in the literature.

Conclusion

There are several limitations on this study. Only limited set of firms as well as only a few technologies based industries were taken into consideration. It is not necessarily possible to generalize these results in the case of other markets, which may have different attitudes. The firms' short-term market performance represents the financial markets' perception of the combination's potential and not its actual short- term performance.

There are other factors like changes in industry, economy and stock market which can have an impact on the financial performance of merged a company, but have not been covered by this study. Secondly, the

study is based only on secondary data. It is limited to the M&A of few companies, and the findings of the study cannot be generalized in the case of whole industry. Third, there are many approaches to measure the impact of merger on the financial performance of the company. There is no unanimous opinion among the experts. The findings of this paper provide scope for future studies:

(I) Studies with similar objectives could be attempted with reference to other sectors.

(II)Studies with similar objectives could be made from time-to-time covering lengthier periods.

(III)Stock index price improvement could be analyzed for pre-merger and post-merger periods.

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