Evaluation of Success of Mergers and Acquisitions by Determining Whether They Are Value Accretive or Destructive

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Abstract

Mergers and Acquisitions are critical in meeting varying corporate needs like entry into a new market, or a new product, or new technology, and at the same time amplify wealth creation for shareholders and other stakeholders. Mergers and Acquisitions arrangements are considered extremely risky due to the multiplicity of variables and unknowns in any arrangement ranging from determining a reasonable price to pay for acquisition to making projections for future growth and synergy of acquisition, the direction of the market, and competitive pressures. The large financial volume of these mergers raises concerns about the enormous consequences for all involved stakeholders.

In any Merger and Acquisition arrangement, the choices that are made by a company in managing variables and unknowns are critical to its success. This creates an opportunity for specialists to observe and contribute. It also creates an opportunity for the researcher to identify a set of metrics that can be used to predict the success of any Merger and Acquisition.

In this study, we have evaluated common metrics of Target companies involved in Mergers and Acquisitions in India. These metrics were selected to adequately reflect the health of a company, and subsequent improvements in the performance trajectory of these metrics can be construed as the success of Mergers and Acquisitions.

It was found that the success of mergers can be largely predicted using

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the target company's return on assets ratio, the target's return on common equity and the target's profit margin.

Analysis was also done to determine whether the premium paid for the acquisition could be justified by back-calculations using metrics like Sales Multiple, Net Asset Multiple and the EBITDA multiple of the deal. It was found that financial statistics in isolation cannot be used to explain the pricing of a merger, and quite often, there is a strong influence of non-financial factors to justify high premiums as well as huge discounts.

Keywords: *Mergers & Acquisitions; Return on Assets ratio; Return on Common Equity ratio.*

INTRODUCTION

Today, Mergers and Acquisitions have become a standard practice for organisations as they contend with a regularly changing worldwide economy. Organisations not only in U.S. but around the globe, seek Mergers and Acquisitions with specific end goals of accomplishing an upper hand through development, solidification, passage into new markets, and above all, apparent monetary profits. Despite the fame of these procedures, not very many Mergers and Acquisitions have met their desired goals. The financial volume of these mergers raises concerns about the enormous consequences for everybody included and the requirement for better implementation of the merger process. Hence, increasing the importance and significance of noteworthy insights of components leading to positive Mergers and Acquisitions results.

Mergers and Acquisitions offer the opportunity of significant upside, but generally the acquiring company takes on the acquisition risk like successfully realizing ultimate revenue and cost synergies. Hence, the question which always needs to be answered by numerous deal teams and the people conducting the due diligence is, whether the price being paid for the firm, in terms of premium or discount to the market value, can be justified based on the company's fundamentals and whether the opportunity of synergies or market leadership isn't coming at too expensive a cost for the merger to be successful.

To deal with this question, first a theoretical framework explaining the reasons why mergers are entered into as well as the factors which influence mergers and acquisitions and impact their success have been examined in detail. Ways to quantify a few of these factors

have also been suggested. Financial multiples of several mergers have also been used to come up with a score that predicts whether the premium payable for the deal should be in excess of 5% or not, wherein premium is examined as premium of offer price to target price where target price is determined based on price prevailing 4 weeks prior to the original announcement. Financial ratios of several mergers have also been used to come up with a score which predicts whether the merger is likely to be a success or not, wherein success is defined as the EPS of the joint entity being greater than the EPS of the 2 separate entities brought to the future using their geometric growth rates.

The expressions 'mergers' and 'acquisitions' are regularly used interchangeably, yet in reality, they are two varying sorts of unions. A merger can be defined as a combination of two corporations in which only one corporation survives and the non-merged corporation goes out of existence. In a merger, the boards of directors of two firms agree to combine and seek stockholder approval for the combination. In most cases, at least 50% of the shareholders of the target and the bidding firm have to agree to the merger. A new firm is created after the merger, and both the acquiring firm and target firm stockholders receive stock in this firm. Citigroup, for example, was the firm created after the consolidation of Citicorp and Travelers' Insurance Group. In an acquisition, the target firm ceases to exist and becomes part of the acquiring firm. For example, Digital Computers was absorbed by Compaq after it was acquired in 1997 and ceased to exist.

Organisations looking to grow rapidly are confronted with a decision between organic development, or, development through mergers and acquisitions. At times, internal growth may be a tedious and uncertain process, however growth through mergers and acquisitions may be a much more rapid process, although it brings with it, its own set of uncertainties. Most mergers and acquisitions take place either to increase revenue or market share, or to reduce costs, or to achieve a combination of results. Thus, most mergers are either for establishing forward or backward linkages with the idea of achieving cost and/or revenue synergies in operations.

Mergers and acquisitions are confronted with numerous questions and instabilities. These instabilities refer to multiple variables in the areas of authority, administration, vision, mix, culture, and correspondence that can influence the progress of a merger in a positive or negative direction. Lamentably, however famous the act of mergers might be, insights demonstrate that the quantities of fizzled mergers exceed the victories. The examination issue is that, in spite of the fact that there is a plenitude of articles, research reports, books, scholastic expositions, and general data about mergers and acquisitions, not very many works

have solidified the components that drive merger success. The focus has been on arrangement disappointment.

The motivation behind this subjective review is to investigate and identify reasons that add to the positive results of mergers and acquisitions. Critical success factors define key areas of performance that are essential for the organisation to accomplish its mission.

In a merger or acquisition, each organisation can keep itself up through its different segments. At the point when organisations can look after themselves, through their segments, they have life which is versatile and complex. These complex adaptive systems behave/ evolve according to three key principles: (1) order is emergent as opposed to hierarchical, (2) the system's history is irreversible, and (3) the system's future is often unpredictable.

Mergers and acquisitions are viewed as complex and supportive frameworks since they are intricate, i.e. each Mergers and Acquisitions is different and comprised of various interconnected components, and versatile i.e. they have the ability to change and learn from experience.

Mergers and acquisitions are not developments of recent past. There is data on Mergers and Acquisitions activity going back to the year 1880. In 2021, Mergers and Acquisitions volumes peaked at an all-time high of $ 5.9 Trillion. USA had more than 50% of the deals valued at $ 3.3 Trillion, while India had $ 113 Billion across 598 deals. The dollar amounts involved are very large thereby increasing the importance of success in Mergers and Acquisitions Deals.

REVIEW OF LITERATURE

Deepak Datta and VK Narayan (1992) in their study Factors influencing Wealth Creation from Mergers and Acquisitions: A Meta-Analysis, have listed and analysed factors influencing wealth creation and have also quantified them. However, the number of factors considered are quite limited and include, regulatory changes, number of bidders, bidder's approach, type of acquisition and mode of payment. Further, a meta-analytic approach has been used to estimate the significance of the hypothesized independent variable, which is taken as the returns on the merger. Control variables have also been introduced, such as the kind of data employed, source of the merger sample and the outcome of the proposed merger or acquisition. Their multi-factor multi-time study explained a significant proportion of variance in the wealth returns and they found evidence that shareholder returns go down in stock financed mergers, multiple bidders vying for the company while tender offers

usually lead to higher returns than mergers, with regulatory changes being only for the better. However, most of the factors discussed weren't found in common with other studies, hence, were only used to support theory claims of important factors in this paper.

Tim Loughran (1997) used data from 947 acquisitions to answer the question 'Do Long-term shareholders benefit from corporate acquisitions?' He found a relationship between the post-acquisition returns and the mode of acquisition and payment. During the 5 year period following the acquisition, firms that complete stock mergers earn significantly less than those who complete all cash mergers, while those who conduct tender offers earn significantly more than simple mergers. However, target shareholders who hold onto the stocks during the pre and post-merger time do not earn significantly higher returns.

David King (2004) in his study 'Meta-Analysis of Post-Acquisition Performance, Indicators of Unidentified moderators' used meta-analytic techniques to empirically assess the impact of the most commonly researched antecedent variables on post-acquisition performance. They found robust results indicating that, on average and across the most commonly studied variables, acquiring firms' performance did not positively change as a function of their acquisition activity, and was negatively affected to a modest extent. More importantly, their results indicated that unidentified variables may explain significant variance in post-acquisition performance, suggesting the need for additional theory development and changes to Mergers and Acquisitions research methods. The factors considered were whether the firm is a conglomerate or not, related acquisitions, method of payment and acquisition experience.

Tara Shawver (2005) has used different financial ratios for 'Merger Premium Prediction using Neural Networks'. Ratios used include ratio of price paid to book value, target's return on equity, net asset multiple, equity multiplier, estimated cost saving ratio and the target's efficiency ratio were considered to predict premiums using a neural network. The results were that 96.3% of the total variance in merger premiums was explained by the neural network after 1000 cycles at 3 nodes. However, this study was done specifically for banks in the United States, and thereby, there was an opportunity to study similar cases in India for all companies, using linear relationship due to lack of software aptitude for processing neural networks.

Csaba Balogh (2006) in Analysis of Factors determining success of cross-border mergers and acquisitions has attempted to integrate both the traditional as well as organization approach of analysing mergers and acquisitions into a single model. The Net Present Value of the merger has been taken as the factor determining success, while different factors have

been used to define success including, cultural differences, human resource, relative size, paid premium, speed of transaction, geographical distance, type of bidding, method of payment and other factors. Further, market based return model has been used for analysing success and factor analysis has been done to decompose different factors and attempt their quantification. The traditional variables such as RoA, RoE etc have also been analysed and a regression model has been built. However, a discriminant analysis had not been done, even though a hypothesis saying that the same is possible was proven true. The same vein has been picked up by us for further analysis.

Lena Petsa-Papanicolaou (2007) in her study titled 'Success factors in mergers and acquisitions, complexity theory and content analysis perspectives' has analysed theoretically several factors impacting the success of mergers and acquisitions. She has used reports from major consulting firms as well as textbooks of major business schools. The factors once analysed have been reviewed under the lens of complexity theory, thereby, introducing non-linearity in it. However, almost all of the factors are completely theoretical, and no quantitative leanings are present, thereby, giving us the opportunity to examine the same factors, their impact on an organisation's success or failure and also, provide our justification as to the modes of their quantification.

Emanuel Gomes(2007) in his study Critical Success Factors through Mergers and Acquisition Process has done a multi-disciplinary review examining key success factors in mergers and acquisitions, with the most relevant and important factors being defined as choice and evaluation of strategic partner, paying the right price, size mismatches and organisation, overall strategy and accumulated experience on Mergers and Acquisitions, Courtship, Integration strategies post-merger, post-acquisition leadership, communication, management of inter-culture differences among others. However, no attempts at quantifying any of the factors has been made and hence, provided an opportunity to continue their research by attempting to quantify some factors.

NM Leepsa (2016), in study titled Predicting Success of Mergers and Acquisitions in Manufacturing Sector in India has developed a logistic regression model based on a sample of 407 successful and unsuccessful mergers in the manufacturing sector in India. However, the ratios analysed were asset turnover, profitability margin and liquidity ratios. It was found that a Z-score using the equation prescribed under this paper, accurately predicted the success or failure in 62.4% of the cases. The opportunity for further research was making a similar score using ratios advocated by greater number of reports as well as those bearing greater significance to overall profitability.

OBJECTIVES OF THE STUDY

1. To come up with metrics that can evaluate adequacy of premium paid in the Mergers and Acquisitions transaction, and establish whether the Mergers and Acquisitions action was over-priced, underpriced or adequately priced.

2. To predict the success of a Mergers and Acquisitions using one or a combination of publicly available performance metrics

RESEARCH METHODOLOGY

At first a theoretical framework explaining the factors which influence mergers and acquisitions and impact their success have been examined in detail, and ways to quantify a few have also been suggested. The methodology for suggesting factors is based on reports of major consulting firms as well as major business school recommended text books as well as guiding papers. Their quantification has been done either in review of different papers or in logical movement of their characteristics.

Models and data analysis was used for evaluating adequacy of premium paid and to come up with metrics to predict success of a merger and acquisition.

The following method was used to evaluate adequacy of premium paid:

1. Premium was defined as excess of offer price above the target's price 4 weeks prior to original announcement of a Merger or Acquisition.

2. Financial metrics were used to come up with a score which predicts whether premium payable should be in excess of 5% or not. Publicly available data from all mergers in India from 1990 to 2016 was used and firms where all the data as regards the Sales Multiple, Net Asset Multiple and the EBITDA multiple of the deal were available as well as the premium of offer price to target trading price was available.

3. Both discriminant analysis and binary logistical regression analysis were used to come up with a score.

4. Data for the secondary analysis was collected from Thomson Reuter's database of mergers and acquisitions.

To predict success of merger, the following method was used:

1. Discriminant Analysis was run on all mergers which had data on EPS, Return on

Assets and EBITDA. Here, the scope of work was limited to only those companies that have the relevant data fields publicly available.

2. Data for the final analysis was collected from Bloomberg's database of mergers and acquisitions.

MODEL BUILDING AND DATA ANALYSIS

To evaluate the adequacy of premium paid using any of the publicly available metrics, the following analysis was done:

Publicly available data from all mergers in India from 1990 to 2016 was used, and firms where all the data as regards the Sales Multiple, Net Asset Multiple and the EBITDA multiple of the deal were available as well as the premium of offer price to target trading price were shortlisted and used. Out of a total list of 400 mergers, only 59 had data on these metrics.

Reason for selecting Sales Multiple, Net Asset Multiple and EBITDA multiple are:

The Sales Multiple was considered because while all the data fields on the original analysis of Tara Shawver (2005) weren't available, the purpose of predicting the revenue generating capacity of the merger can be achieved only through analysis of the sales of the target as regards the enterprise value. If the sales potential of the target company is quite low, then it follows that the premium payable should be low.

The Net Asset Multiple was considered as it was an original data field considered by Tara Shawver (2005) for the purpose of giving an idea of the total assets that were being acquired with reference to the enterprise value of the firm.

The EBITDA Multiple was considered because while all the data fields on the original analysis of Tara Shawver (2005) weren't available, the purpose of predicting the ability of the target to generate cash flows and hence, its profitability can be sufficiently achieved through analysis of the EBITDA multiple, which is quite often used as a valuation technique in itself. Financial specialists for the most part utilize an organisation's EBITDA multiple to decide if an organization's value is underestimated or exaggerated. A low valuation demonstrates that an organization may be underestimated, and a high proportion shows that the organization may be exaggerated, and hence the premium payable should change accordingly.

Success was in the binary, if premium was higher than 5%, the merger was given a

score of 0, and if it was less than 5% it was given a score of 1.

Table 1 represents the characteristics and measures of central tendency of the data used for analyzing the adequacy of premium paid.

Table 1: Group Statistics

SUCCESS/FAILURE		Mean	Std. Deviation Unweighted	Valid N (listwise)	
				Weighted	
0	Sales Multiple	1.52593	1.504476	29	29.000
	Net Asset	2.01500	4.523008	29	29.000
	EBITDA	1.22563	34.686863	29	29.000
1	Sales Multiple	3.51840	6.913893	30	30.000
	Net Asset	3.18520	3.834249	30	30.000
	EBITDA	19.07775	52.032925	30	30.000
Total	Sales Multiple	2.53905	5.099310	59	59.000
	Net Asset	2.61002	4.192250	59	59.000
	EBITDA	10.30298	44.895238	59	59.000

Table 2 represents how the factors are related to and influence each other. Covariance measures the extent of change driven in one variable by the other while Correlation looks at the common direction of change for 2 variables at a time.

Table 2: Pooled Within-Groups Matrices

		Sales Multiple	Net Asset	EBITDA
Covariance	Sales Multiple	25.432	3.966	144.708
	Net Asset	3.966	17.529	62.587
	EBITDA	144.708	62.587	1968.497
Correlation	Sales Multiple	1.000	.188	.647
	Net Asset	.188	1.000	.337
	EBITDA	.647	.337	1.000

SUMMARY OF CANONICAL DISCRIMINANT FUNCTIONS

A discriminant analysis was done to establish whether adequacy of premium paid could be reduced to a formula or not. The test of Eigen values and Wilk's Lambda was done. Eigen value represents the non-zero vector that changes at most by a scalar factor when that linear transformation is applied to it. Wilk's Lambda is the statistic used as a measure of the class centers separation whereas the Eigen value indicates the proportion of variance explained – between groups sums of squares divided by within groups sums of squares. A large Eigen value is associated with a strong function and describe how much discriminating ability a function possesses. Since the canonical correlation is 0.232 and Eigen value is 0.057, we can prima facie say that the function is not very strong. This is depicted in Table 3 given here:

Table 3: Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1*	.057[a]	100.0	100.0	.232

First 1* canonical discriminant functions were used in the analysis.

Wilks' Lambda explains the proportion of total variance in the discriminant scores not explained by differences among groups. In Table 4, we find that Wilks' Lambda is 0.946 and the significance value is 0.383 based on which we can conclude that the group means are not different and we accept H_0 that no discriminant analysis holds true.

Table 4: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-Square	Degrees of Freedom	Significance
1	.946	3.057	3	.383

Table 5 represents the Standardized coefficients of the 3 variables in our Discriminant Analysis of adequacy of premium paid

Table 5: Standardized Canonical Discriminant Function Coefficients

	Function
	1
Sales Multiple	.514
Net Asset	.364
EBITDA	.405

Table 6 reveals the correlations between the variables and the model and the discriminant functions. Since they are very high, each of the variables is closely related to each function.

Variables have been ordered by absolute size of correlation within function.

Table 6: Structure Matrix

	Function
	1
EBITDA	.860
Sales Multiple	.844
Net Asset	.597

Table 7 represents the Un-Standardized coefficients of the 3 variables in our Discriminant Analysis of adequacy of premium paid

Table 7: Canonical Discriminant Function Coefficients

	Function
	1
Sales Multiple	.102
Net Asset	.087
EBITDA	.009
(Constant)	-.580

The Logistical regression model gave the result that the EBITDA multiple was the most significant with the Net Asset multiple having the least significance. However, as the significance of their Beta values were greater than 0.05, the equation was found to be of little use, despite it predicting 47.5% of the cases correctly. A Regression analysis was also done to predict log of premiums, however, that too was found redundant as the explained variance was very low and the significance was greater than 0.05.

Table 8 represents the Coefficients of the Logistic Regression equation as well as the Constant in the equation for both Success as well as Failure results.

Table 8: Classification Function Coefficients

	SUCCESS/FAILURE	
	0	1
Sales Multiple	.103	.150
Net Asset	.131	.172
EBITDA	-.011	-.007
(Constant)	-.897	-1.167

Table 9 depicts the predicted group membership as per the logistic regression equation as well as the original group membership

Table 9: Classification Results

		SUCCESS/ FAILURE	**Predicted Group Membership**		**Total**
			0	**1**	
Original	Count	0	19	10	29
		1	17	13	30
	%	0	65.5	34.5	100.0
		1	56.7	43.3	100.0

ANALYSIS OF REGRESSION FOR PREMIUM PAYABLE

Table 10 covers the measures of central tendency for each variable as well as the log constant

Table 10: Descriptive Statistics

	Mean	**Standard Deviation**	**N**
Log Values	4.50451	1.141981	59
Net Asset	2.61002	4.192250	59
Sales Multiple	2.53905	5.099310	59
EBITDA	10.30298	44.895238	59

Table 11 covers the correlations between all the variables as well as the Dependent variable captured through log values and gives an idea of how each variable moves with the other variables

Table 11: Correlations

		Log values	Net Asset	Sales Multiple	EBITDA
Pearson Correlation	Log values	1.000	.085	.064	.001
	Net Asset	.085	1.000	.210	.355
	Sales Multiple	.064	.210	1.000	.661
	EBITDA	.001	.355	.661	1.000
Sig. (1-tailed)	Log values	.	.262	.316	.497
	Net Asset	.262	.	.055	.003
	Sales Multiple	.316	.055	.	.000
	EBITDA	.497	.003	.000	.
N	Log values	59	59	59	59
	Net Asset	59	59	59	59
	Sales Multiple	59	59	59	59
	EBITDA	59	59	59	59

Table 12 talks about the fit of the model, since the R Square of the model is 0.016, only 1.6% of the total variance is explained by the model and hence it is not a good fit.

Table 12: Model Summary

Model	R	R Square	Adjusted R Square	Std. error of the estimate	Change Statistics	
					R Square Change	F Change
1	.125	.016	-.038	1.163470	.016	.292

Table 13 talks about the fit of the model and since the significance level is 0.831 we accept H_0 that the variables cannot be used in a predictive manner to attain our desired results

Table 13: Model Summary

Model	Change Statistics			Durbin-Watson
	Degrees of Freedom 1	Degrees of Freedom 2	Significance of Freedom Change	
1	3[a]	55	.831	1.932

a. Predictors: Constant, EBITDA, Net Asset, Sales Multiple

Table 14 gives us the final Unstandardized and Standardized Betas for a predictive logistic regression model however the model is not a good fit as concluded earlier

Table 14: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t value	Significance
		B	Std. error	Beta		
1	(Constant)	4.397	.193		22.732	.000
	Net Asset	.027	.039	.100	.695	.490
	Sales Multiple	.026	.040	.116	.651	.517
	EBITDA	-.003	.005	-.111	-.595	.554

The model and analysis to predict success of a Merger and Acquisition using one or a combination of publicly available performance metrics is detailed here.

33 firms were considered, as out of a list of over 1000, only these 33 had data as far as return on assets, profitability, return on equity, trailing 12 months EPS and post-merger EPS goes. Reason for selecting these Metrics were:

The Return on equity, was used in the final success prediction analysis, as it is a basic measure of how much return the owners of the firm are getting in relation to their investment. The ROE is helpful for contrasting the benefit of an organisation with that of different firms, and hence, should serve as an important analytical criteria for an investment decision.

The Return on Assets ratio was used in the final success prediction analysis, as it is a basic measure of how efficiently the assets of the firm are being utilized to generate returns. It gives investors an idea of how viably the organisation is changing over the cash it needs to put into net profits. The higher the ROA number, the better, in light of the fact that the organisation is procuring more cash on less asset base.

The Profitability margin was used in the final success prediction analysis, as it not only is a basic metric of comparing how much turnover is being generated into net profits by the different companies, but also has been advocated by several researchers as being impactful on mergers and acquisition results.

Success was defined in the binary, if the EPS of the target firm was greater post the merger than the EPS of the target firm before the merger (brought to the future using geometric growth rate), then the merger was given a score of 1, else it was given a score of 0.

ANALYSIS OF DATA FOR DISCRIMINANT ANALYSIS OF SUCCESS OF MERGER

Table 15 represents the characteristics and measures of central tendency of the data used for predicting the success of a Merger and Acquisition.

Table 15: Group Statistics

Success/Failure		Mean	Standard Deviation Unweighted	Valid N (listwise)	
				Weighted	
0	Target ROA based on bottom EPS	12.09754	11.064485	25	25.000
	Target Profit Margin	12.67900	9.494156	25	25.000
	Target Return on Common Equity	20.83281	14.145871	25	25.000
1	Target ROA based on bottom EPS	7.73167	4.114349	8	8.000
	Target Profit Margin	32.26094	22.433361	8	8.000
	Target Return on Common Equity	16.81646	7.207617	8	8.000
Total	Target ROA based on Bottom EPS	11.03915	9.956410	33	33.000
	Target Profit Margin	17.42614	15.821346	33	33.000
	Target Return on Common Equity	19.85915	12.825693	33	33.000

Box's Test of Equality of Covariance Matrices

Table 16 depicts the log determinants of both success and failure cases. Box's M tests for homogeneity of covariance matrices according to the success / failure classification factor. It compares the product of the log determinant of the pooled covariance matrix and uses a Chi Square approximation. The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Table 16: Log Determinants

Success / Failure	Rank	Log Determinant
0	3	12.208
1	3	12.728
Pooled within-groups	3	13.415

Table 17 tests null hypothesis of equal population covariance matrices and since the significance level is 0.000 we reject H_0 that the population covariance is similar to the covariance of the success / failure classification factor, and hence we conclude that the covariance of the success and failure classification factors are significantly different from each other.

Table 17: Test Results

Box's M		33.799
F	Approx.	4.670
	Degrees of Freedom 1	6
	Degrees of Freedom 2	1004.670
	Significance	.000

SUMMARY OF CANONICAL DISCRIMINANT FUNCTIONS

Table 18 and 19 depict that a discriminant analysis was also done to establish whether predicting success of a Merger and Acquisition could be reduced to a formula or not. A check on Wilk's Lambda showed that it had a significance of 0.002 hence we reject H_0 and establish that the discriminant equation is significant.

Eigen value represents the non-zero vector that changes at most by a scalar factor when that linear transformation is applied to it. Wilk's Lambda is the statistic used as a measure of the Class Centers separation whereas the Eigen value indicates the proportion of variance explained – between groups sums of squares divided by within groups sums of squares. A large Eigen value is associated with a strong function and describe how much discriminating ability a function possesses. Since the canonical correlation is 0.633 and Eigen value is 0.669, we can prima facie say that the function is strong.

Table 18: Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.669	100.0	100.0	.633

1 canonical discriminant functions were used in the analysis.

Table 19: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-Square	df	Sig.
1	.599	15.107	3	.002

Table 20 represents the Standardized coefficients of the 3 variables in our Discriminant Analysis of predicting success of a Merger and Acquisition

Table 20: Standardized Canonical Discriminant Function Coefficients

	Function
	1
Target ROA based on Bottom EPS	-1.049
Target Profit Margin	1.064
Target Return on Common Equity	.481

Table 21 details the correlations between the variables, the model and the discriminant functions. Since they are not very high, the variables are not closely related to the function.

This represents pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions. Variables have been ordered by absolute size of correlation within function.

Table 21: Structure Matrix

	Function
	1
Target Profit Margin	.782
Target ROA based on Bottom EPS	-.238
Target Return on Common equity	-.168

Variables ordered by absolute size of correlation within function.

Table 22 represents the Un-Standardized coefficients of the 3 variables in our Discriminant Analysis of predicting success of a Merger and Acquisition

Table 22: Canonical Discriminant Function Coefficients

	Function
	1
Target ROA based on Bottom EPS	-.106
Target Profit Margin	.079
Target Return on Common Equity	.037
(Constant)	-.943

The significance of the Chi Square value and as a result of the discriminant analysis was 0.002 and hence, the discriminant analysis was accepted. The Wilk's Lambda was 0.599, while the canonical correlation was 0.633 and hence, a good fit. Also, ~78% of all data was correctly classified by the discriminant equation, and hence, it can be confirmed that it is a good fit.

FINDINGS OF STUDY

Under the first undertaking of the research paper, analysis of different factors influencing the success of mergers was done, and an attempt was made at their quantification. The results of the same are:

An audit of the number-two positioned management consulting website, Boston Consulting Group, publications section containing Mergers yielded 22 important research articles. Achievement variables from these articles were accounted for in the regions of authority practices, worker and speculator issues as well as individuals issues, data innovation incorporation, correspondence, financial atmosphere, pre-merger reconciliation etc

1. The first success factor so defined is Leadership: BCG looks at Leadership to have clear Opening and Shutting offers ahead of time to stay from the danger of arrangement fever; must be astute in identifying and estimating potential arrangements and testing the upside capability that would be realized; have the ability to manage the entire procedure in an orderly, 'mechanical' way. Leadership capability will be determined based on the number of years of cumulative experience of the Board, as well as the number of Mergers and Acquisitions s handled by them.

2. The second success factor is employees: Sharing a sound business case that details out Why and How of Mergers and Acquisitions is critical along with clarity on the path and ultimate destination. Support of the interests of workers and investors helps in getting employee commitment and continuity. Recognition of differences in culture of the organizations and its impact on employees, and work towards a homogenous new culture. Clarity on goals and criteria to retain leaders help in keeping employees focused and motivated.

3. The next important variable identified by BCG is the integration of Information technology: This involves evaluation of current frameworks; recognizing vital applications; pick a systems landscape application by application; pick one whole IT frameworks landscape. Quantification of this can be done on a case to case basis, and minimizing the number of applications needing integration across both the new companies is desirable.

4. The other highly important variable as identified by BCG is Communication: Internal Communication is key to success of the Mergers and Acquisitions, and is an integral part of the points discussed here. Communication needs to show that the merger process is under control; it needs to alleviate fears of employee representatives, clients, shareholders and potential investors; and improve the reputation of the consolidated organization.

5. One of the most important variables identified by BCG is the Integration post the merger. Some of the important aspects in the integration journey are characterizing each organization's working model and coming up with new operating model; setting clear goals and targets for cutbacks and cost reduction, reduction in capital consumption and working capital requirements; settle on hard decisions and unite forcefully, and monitor their execution; empower supervisors managing the process to make and execute decisions rapidly; devise a way to deal with clients; agree on direction of new branding for the entity; and, routinely revisit the Mergers and Acquisitions targets and actual results in subsequent years to identify gaps and improvement areas.

6. Deal teams are also thought of as an important component of the merger by BCG.

For the analysis of premium payable, both discriminant and logistic regression were used, ultimately without consequence. An attempt was also made to use linear multiple regression analysis in order to predict premium payable. However, that too was unsuccessful.

Both discriminant analysis and binary logistical regression analysis were used to come up with a score, with the initial discriminant analysis coming out with a successful prediction rate of 54.2% and after weeding out of outliers, the new score predicted 61.1% of the original groups correctly classified. However, the Chi Square statistic for both was found to be greater than 0.05, and hence, the null hypothesis was accepted that the canonical correlation of the function is equal to 0 and the ability of the function to discriminate is severely impaired. However, the results state that the Sales Multiple was the most significant, and as it increased the probability that the premium paid would be in excess of 5% also increased.

The Logistical regression model gave the result that the EBITDA multiple was the most significant with the Net Asset multiple having the least significance. However, as the significance of their Beta values were greater than 0.05, the equation was found to be of little use, despite it predicting 47.5% of the cases correctly. A Regression analysis was also done to predict log of premiums, however, that too was found redundant as the explained variance was very low and the significance was greater than 0.05.

For the analysis of success of a Merger and Acquisition, discriminant analysis was used with success being the grouping variable or the dependent variable and the other factors so defined being the independent variables. The analysis for predicting successful mergers was a success, with the Discriminant Analysis being run on all mergers which had financial metrics detailed in earlier sections. Return on Assets of the target company was found to be the most significant, even though it had a negative relationship with success. Even though Box's M test had significant value (<0.05), several previous analyses have proved that Discriminant Analysis is robust even when there is unequal variances among groups.

This discriminant equation was found to be of significance. It was found that the equation hence, derived was Target ROA*(-.106) +Target Profit Margin*(0.079)+Target Return on equity*(0.037).

CONCLUSION

Only financial statistics cannot be used to explain the premium as regards the pricing of a merger, and quite often, the non-financial characteristics have a high enough influence on a merger to explain high premiums as well as huge discounts.

At the same time, it was found that the success of mergers can largely be predicted using the target company's return on assets ratio, the target's return on common equity and

the target's profit margin. Also, ~78% of all data was correctly classified by the discriminant equation, and hence, it can be confirmed that it is a good fit.

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