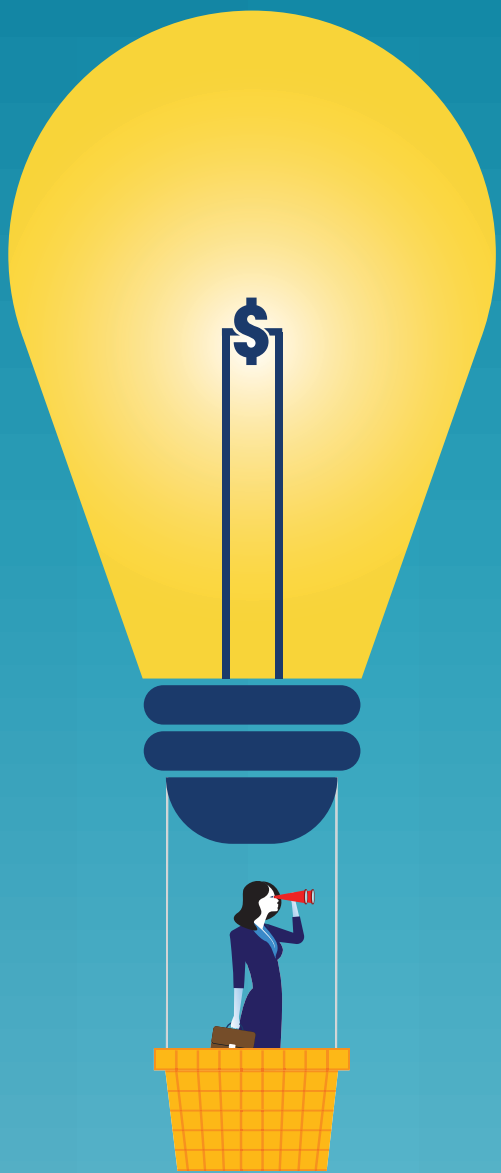
SINGAPORE MANAGEMENT JOURNAL

Vol. 6
No. 2



EASB™

2017

Singapore Management Journal

Vol. 6 No. 2, 2017

The Singapore Management Journal is published bi-annually by the East Asia Institute of Management (EASB™), 9, Ah Hood Road, Singapore 329975.

The first issue of the Journal was published in January, 2012.

For subscriptions and enquiries, please email: research@easb.edu.sg

ISSN 2251-239X
MICA (P) 174/01/2010

Editorial Committee

Editorial Comment

The quest for certainty can be viewed as an attempt to escape from the world of time and chance. The history of human thought seems to indicate this quest has been an exercise in futility, resulting in much wasted intellectual resources. Given the contingencies of life, pragmatists suggest that it will be a more productive use of our intellectual energy by freeing and directing them towards imagination, the source of all creativity and innovation. This turn moves us away from trying to anchor the past in the eternal, to focus on a future of imagined unlimited possibilities, to stimulate creative, innovative, even disruptive ways of creating a better human future. Imagining possibilities is a better way of knowledge-creation than the search for objective truth and certainty.

Imagination translated into novelty and out-of- the-box thinking can disruptively create successful new products, more efficient services, and more fulfilling ways of working and living. Thinking differently is a problem-solving tool we need to create a better future in business and society.

A further thought: justifying and communicating research findings is a risky, dangerous and fallible exercise. The plethora of possible interpretations for any set of empirical evidence and the projection of probabilities amidst peering into the unknown future will soon help us to realise that things are not as determinate as we would like them to be. It will thus be helpful for us to remember that when someone (writer) says something about something to someone (reader, interpreter), this opens up the potential for fruitful conversation. This possibility will only translate into reality if readers engage in such a conversation with authors on the issues they addressed. They can be contacted via their emails listed at the end of this volume.

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“The entrepreneur always searches for change, responds to it, and exploits it as an opportunity.”

– Peter Drucker

Gender Dominance in the Development of Indian Entrepreneurs

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Abstract

A masculine society has traits categorised as male, such as strength, dominance, assertiveness, and egotism. Feminine society is traditionally thought of as having conventional traits, such as being supportive, caring, and relationship oriented. Each type of society responds differently, as an audience in the business world. This study described the gender dominance among entrepreneurs and its consequences on entrepreneurial development. Exploratory Factor Analysis was used to identify factors behind gender dominance among entrepreneurs. Multivariate analysis was used to examine the effectiveness of gender dominance in entrepreneurial development. Four dependent variables of Age, Industry Experience, Number of Entrepreneurial Development Programmes attended and Difficulties in expansion were explored against five independent (predictor) variables. A survey instrument was developed and used to measure the impact of Hofstede's cultural dimensions of Masculinity & Femininity on entrepreneurship.

Keywords: Masculinity & Femininity, Gender Dominance, Entrepreneurial Development

Introduction

As entrepreneurs organised and managed businesses, they would be aware of societal norms and changes creating emerging business opportunities. Such insights allowed better tailoring of offerings to buyers' needs. An important life domain is that of gender roles and expected sex-related behaviours regarding masculinity and femininity. (Smart et al., 2007). Gender is manifested in the ways that individuals style their bodies and carry themselves, and also in how they speak and move. In this way, gender is not only produced by and on particular bodies but is also located within particular activities, behaviours, and practices. It is through the "stylised repetition" of these gendered practices (e.g., body gestures, mannerisms) that gender is performed (Butler, 1988; Butler, 2004).

Management deals with man-made realities. People built organisations according to their values, and societies were composed of institutions and organisations that reflected the dominant values within their culture (Hofstede, 1984). Hofstede defined masculinity/femininity (Mas/Fem) as one of five empirically derived dimensions of culture. Masculinity stood for a society in which men were supposed to be assertive, tough, and focused on material success: Women were supposed to be more modest, tender and concerned with the quality of life (Hofstede, 1998). (Meier and Lambert, 1991) found that women showed higher levels of discomfort with computers than men. Ideas about masculinity were constantly subject to change as a result of generational differences in gender attitudes and practices (Connell & Wood, 2005). In more masculine societies, work was the focus of life. The expectation was that work should not only offer security and compensation, but should also be interesting. Managers were expected to be decisive, firm, assertive, competitive, and just. On the other hand in feminine cultures, work was seen not as the focus of life but as a way to support the more important things in life. The focus of work life was on relationships and working conditions. Managers were expected to be intuitive and sensitive to the needs and counsel of others (Sale, 2004). Gender had been theorised as a performance, constructed through the everyday practices of individuals (Butler, 1988; Lyons, 2009). A person with a more masculine identity should engage in behaviours whose meanings were more masculine, such as behaving in a more dominant, competitive, and autonomous manner (Ashmore, Del Boca, and Wohlers 1986). Research showed that men and women had different styles of leadership. Women adapted to leadership

that was more democratic and less autocratic than men. (Eagely, Johannesen-Schmidt, & Engen, 2003). Women were people oriented while men were task oriented. Some research studies also concluded that women were better transformational leaders than men were (Bass and Avolio, 1994) Women leaders rated higher on transformational behaviours than men leaders. Other research showed that the "good manager" was still described as masculine despite the growing number of women managers (Powell & Butterfield, 1989).

The sense of self-ownership was a major element of the entrepreneurial outlook. An entrepreneur was one who owned the business and controls it. It belonged to "him/ her" as an individual. The individual who championed a concept tended to persist in overcoming internal and external obstacles, accepted responsibility for failure, and, in effect, risked his/ her job on the outcome of a venture (Morris et al, 1994).

This research paper describes and explains the concept of gender dominance using Hofstede's gender dominance dimension and the analysis of respondent data collected through a questionnaire. Bi-Variate analysis was carried out to identify and measure the specific influence of Age, Qualification and Gender ethnic diversity on the cultural dimensions of gender dominance on entrepreneurship.

Literature Review

Culture may be defined as a set of shared values, beliefs and norms of a group or community (Hofstede, 1991). The masculinity-femininity dimension of a culture referred to the degree to which values associated with stereotypes of masculinity (such as aggressiveness and dominance) and femininity (such as compassion, empathy, and emotional openness) were emphasised. High masculinity cultures such as Japan, Germany, and the USA tended to have more sex-differentiated occupational structures with certain jobs almost entirely assigned to women and others to men. There was also a stronger emphasis on achievement, growth, and challenge in jobs (Treven et al., 2008). In general, influence attempts by women and girls were more likely to be ignored than attempts by men and boys, and in group interactions, contributions by men received more attention from other group members and had a greater effect on group members' decisions than the same contributions by women (Altemeyer & Jones,

1974; Jacklin & Maccoby, 1978; Propp, 1995). Women were more likely to receive social backlash when successful in a male-dominated occupation (Heilman, Wallen, Fuchs, & Tamkins, 2004). Surprisingly, both men and women were prone to see women who violated social gender norms as not likeable, and both had a tendency for hostility against women who were successful in male-dominated occupations (Taylor, 2010; Heilman et al., 2004). Research showed that men who were successful at female-dominated occupations did not produce social disapproval and when it did, it was of benefit to them (Heilman et al., 2004). Gender differences in opportunity identification had been linked to differences in human capital variables including education and work experience, with men documented to leverage significantly higher levels of prior industry or entrepreneurial experience as well as experience in managing employees than women. On the other hand, the evidence generally suggested that women had less human capital to bring to self-employment, negatively impacting their opportunity identification and exploitation potential (Jamali, 2009). Women generally had lower status and power than men did, particularly power based on expertise or legitimate authority. He also argued that assertive speech was one domain of power denied to women, but available to men. That is, because women were relatively powerless and marginal compared with men, they presumably were not given the opportunity to express themselves as forcefully and directly as men were (Carli, 1990). A female employee in a company with a culture of mere legal compliance (affirmative action justification) was more likely to perceive a female manager as communal (supportive, understanding, sensitive, and caring) and to believe in the need to adopt this compassionate and communal behaviour than a female employee in a company that valued the intrinsic nature of diversity (Patil, 2008). On the other hand (Barrios, Y. & DiDona, T., 2013) argued that gender roles were changing with women increasingly becoming less stigmatised in the workplace, even in a male dominated industry.

Objectives

The broad objectives of the study were as follows:

1. To identify and measure the various dimensions of gender dominance among entrepreneurs.
2. To examine the effectiveness of gender dominance in Entrepreneurial Development.

Hypothesis

The broad hypotheses of the study were as follows:

H_{01}: There is an impact of gender performance & meeting effectiveness on entrepreneurial development.

H_{02}: There is an impact of gender career preference and problem solving skill on entrepreneurial development.

Research Methodology

An exploratory research design was adopted, with data collected from primary as well as from secondary sources. The secondary data was from published and unpublished business reports, magazines, journals, books, historical studies, articles, state and central government report and the internet. The review of literature for this study was completely based on the collection of secondary data. Primary data was collected from respondents who completed the questionnaire.

Sampling procedure

Stratified random sampling procedures were used to create a sample on the basis of various demographic parameters of the respondents. The sample size for the study comprised of 1500 respondents with varied demographic profiles.

Area of Study

This study was conducted in selected districts of Uttarakhand (Dehradun, Haridwar ,Haldwani, Udhamsingh Nagar), Delhi, NCR, Haryana (Kurekshetra, Panipat, Rohatak) and Punjab (Amritshar, Jhalandar, Ropad) on the basis of concentrations of small and medium scale Industries. The types of small and medium scale industries considered for the study were Agro products, Textile & Hosiery products, Food products & Beverages, Electronic & Electrical.

Reliability Analysis

Reliability analysis was performed to test the reliability of scale and inner consistency of extracted factors. For this purpose, Cronbach's alpha coefficient was calculated. Cronbach's alpha coefficient value for the data set was 0.907, considered as acceptable as an indication of scale reliability. Data set was said to be suitable for factor analysis if Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) value is 0.6 or above and Bartlett's Test of Sphericity value should be significant (i.e. the Sig. value should be 0.05 or smaller).

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.848
Bartlett's Test of Sphericity	Approx. Chi-Square	4980
	Df	10
	Sig.	.000

In this case the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) value was .848. Bartlett's test of Sphericity was significant, χ^2 (10) = 4980, p=.000, indicating that the correlation matrix was not an identity matrix and therefore factor analysis would be appropriate.

Statistical Tools: Factor analysis was used to identify the underlying the factors behind gender dominance. Tests of significance and multiple regression helped to identify gender dominance among the entrepreneurs and its consequences on entrepreneurial development.

Analysis and interpretation

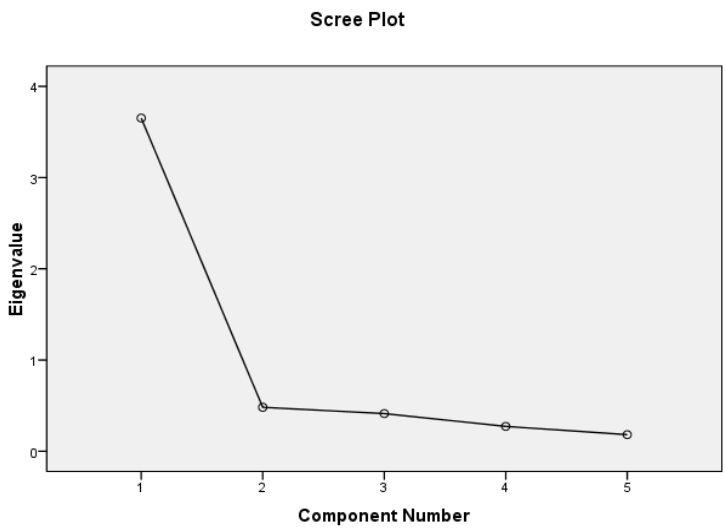
Exploratory factor analysis was performed on the gender dominance attributes included in the questionnaire in order to determine the underling dimensions of gender dominance. A five point Likert-scale was used (from strongly agree, agree, neutral, disagree and strongly disagree) for gender dominance and principal component analysis and eigen value equal to or greater than 1 was used. The approach was to retain items with factor loadings of equal to or above 0.50 (Hair et al., 1998).

Table 2: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.652	73.040	73.040	3.652	73.040	**73.040**
2	.482	9.634	82.674			
3	.413	8.251	90.925			
4	.272	5.443	96.368			
5	.182	3.632	100.000			

Extraction Method: Principal Component Analysis.

The Eigen value for factor 1 was 3.652. Five gender dominance attributes had a percentage up to 73.040% of the total variance.



Scree Plot involved plotting each of the eigenvalues of the factors and retaining all factors above the elbow, or break in the plot, as these factors contributed the most to the explanation of the variance in the data set. This Scree Plot determined the eigenvalues of 5 attributes for Gender Dominance. One of the most commonly used techniques was Kaiser's criterion or the eigenvalue rule. Using this rule, only one factor with an eigenvalue of 1.0 or more was retained for further investigation.

Table 3: Component Matrix[a]

	Component
	1
Men solve problems with logical analysis	**.869**
Solving organisational problems require active approaches.	**.822**
Men perform better than women in high level positions.	**.821**
Meetings chaired by men are effective.	**.896**
Professional career is more important for men than for women.	**.863**

Extraction Method: Principal Component Analysis.
a. 1 component extracted.

Gender was the most important factor in explaining the dominance of masculinity over femininity. The statement under this factor reflected a high factor loading and only one factor was extracted from the dataset; hence the factor was named as gender dominance.

Multiple regression analysis was used to determine the proposed relationship between predictors and entrepreneurial development attributes.

Table 4: Regression Model (Age as Dependent Variable)

Dependent Variable	**Age**						
Test of Independence by Durbin-Watson test	2.126						
Outliers	Min. -2.748 & max. 2.894						
R Square Value	.119						
F value of the model	40.200						
Significance	0.000 @ d.f. (regression 5), (residual 1494)						
Coefficients							
Predictors (Independent Variables)	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**co linearity statistics**	
	B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
(Constant)	1.909	.082		23.202	.000		
Men perform better than women in high level positions	.181	.027	.243	6.793	.000	.459	2.177
Men solve problems with logical analysis	-.093	.034	-.121	-2.756	.006	.306	3.264
Meetings chaired by men are effective	.062	.033	.085	1.862	.063	.285	3.504
Professional career is more important for men than for women	.216	.033	.265	6.601	.000	.366	2.733
Solving organisational problems require active approaches	-.107	.028	-.139	-3.798	.000	.439	2.276

Multicollinearity indicated that a variable was almost a linear combination of other independent variables. To avoid multicollinearity in multiple regression between the independent variables, Variance Inflation Factor (VIF) should be < 10. The model depicted that all predictors had a VIF of less than 10. The Tolerance factor should lie between (0-1) and the co linearity statistics of the study depicted that it lay between 0-1. We interpreted this as indicating that there was no multicollinearity for the independent variables.

Test of Independence by using Durbin-Watson test. The Durbin Watson estimate ranged from zero to four. The independence assumption was satisfied as the value of Durbin-Watson was equal to 2.126, between 0-4. Outliers Standard Residual should lie between (-3.3 to +3.3) for (Minimum to maximum). The table depicted that the result lay between the internal i.e., minimum was -2.748 and maximum was 2.894, indicating there was no outliers.

Regression Model (Age as Dependent Variable). Table 4

Age = 1.909 + .181* men perform better than women in high level positions - .093* men solve problems with logical analysis +.216* importance of professional career for men than for women - .107* solving organisational problems require active approach.

The R^2 value was .119, i.e 11.9% of the variance in age could be explained as men performing better than women in high level positions; men solved problems with logical analysis; and meetings were effective chaired by men. The importance of professional careers for men than for women and solving organisational problems required active approaches. The B weight pointed to the relationship between dependent variable and each predictor (independent variable). The standardised coefficient **(Beta)** for importance of professional career for men than for women was .265, which meant, after controlling for other predictors, a one (1) standard deviation (SD) increase in importance of professional career for men than for women would result in a .265 increase in Age of respondent. The results were analysed to test the hypothesis impact of predictors on age. The ANOVA was significant (F=40.200, d.f. (regression) =5, d.f. (residual) =1494, Sig. = 0.000) which meant the model was significant i.e. all the predictors collectively accounted for a statistically significant proportion of the variance in the criterion table. From the magnitude of the t-statistics, men performed better

than women in high level positions (t= 6.793, p<0.01) accounted for the significant proportion of unique variance on respondents age but meetings were effective chaired by men (t = 1.862, p>0.05), was insignificant in the model.

Table 5: Regression Model (Industry Experience as Dependent Variable)

Dependent Variable	Industry Experience						
Test of Independence by Durbin-Watson test	2.059						
Outliers	Min. -1.544 & max. 2.410						
R Square Value	.136						
F value of the model	46.856						
Significance	0.000 @ d.f. (regression 5), (residual 1494)						
Coefficients							
Predictors (Independent Variables)	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**co linearity statistics**	
	B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
(Constant)	2.108	.080		26.449	.000		
Men perform better than women in high level positions	.137	.026	.188	5.298	.000	.459	2.177
Men solve problems with logical analysis	-.276	.033	-.368	-8.457	.000	.306	3.264
Meetings are effective chaired by men	-.027	.032	-.038	-.845	.398	.285	3.504
Importance of professional career for men than for women	.309	.032	.387	9.735	.000	.366	2.733
Solving organisational problems require active approach	-.276	.027	-.366	-10.089	.000	.439	2.276

The model showed that all predictors had VIF less than 10. The multicollinearity statistics of the study depicted that tolerance factor was between 0-1, assumes no multicollinearity for the independent variables. The independence assumption was satisfied as the value of Durbin-Watson was equal to 2.059, between 0-4. The table depicted that the result of the standard residual minimum was -1.544 and maximum was 2.410, i.e. no outliers.

Regression Model (Industry Experience as Dependent Variable). Table 5

Industry Experience = 2.108 + .137* men perform better than women in high level positions - .276* men solve problems with logical analysis +.309* importance of professional career for men than for women - .276* solving organisational problems require active approach.

The value of R^2 was .136, i.e. 13.6% of the variance in industry experience could be explained by men performing better than women in high level positions, men solving

problems with logical analysis, meetings being effective chaired by men, importance of professional career for men than for women and solving organizational problems requiring active approach.

The standardised coefficient (Beta) for importance of professional career for men than women was .387 which meant that, after controlling for other predictors, a one (1) standard deviation (SD) increase in importance of professional career for men than women would result in a .387 increase in industry experience of respondents. The results were analysed to test the hypothesis impact of predictors on industry experience. The ANOVA was significant (F= 46.856, d.f. (regression) =5, d.f. (residual) =1494, Sig. = 0.000) reflected the model was significant which meant that all the predictors collectively account for a statistically significant proportion of the variance in the criterion table. From the magnitude of the t-statistics, importance of professional career for men than women (t= 9.735, $p<0.01$) accounted for the significant proportion of unique variance on respondents' industry experience but meetings were effective chaired by men (t = -.845, $p> 0.05$) results to be insignificant in the model.

Table 6: Regression Model (EDPs Attended as Dependent Variable)

Dependent Variable	**Number of entrepreneurial development programs attended**						
Test of Independence by Durbin-Watson test	2.081						
Outliers	Min. -1.890 & max. 2.565						
R Square Value	.167						
F value of the model	59.939						
Significance	0.000 @ d.f. (regression 5), (residual 1494)						
Coefficients							
Predictors (Independent Variables)	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**co linearity statistics**	
	B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
(Constant)	2.674	.073		36.614	.000		
Men perform better than women in high level positions	-.138	.024	-.203	-5.826	.000	.459	2.177
Men solve problems with logical analysis	-.083	.030	-.119	-2.785	.005	.306	3.264
Meetings are effective chaired by men	-.107	.029	-.161	-3.647	.000	.285	3.504
Importance of professional career for men than for women	-.150	.029	-.201	-5.159	.000	.366	2.733
Solving organisational problems require active approach	.265	.025	.376	10.542	.000	.439	2.276

The model showed that VIF of all predictors had values lower than 10. The

co linearity statistics of the study depicted that tolerance factor lay between 0-1, indicating there was no multi collinearity for independent variables. The independence assumption was satisfied as the value of Durbin-Watson was equals to 2.081 which lay between 0-4. The table depicted that the result of Standard Residual lay between the internal i.e., minimum was -1.890 and maximum was 2.565, indicating there were no outliers.

Regression Model (EDPs Attended as Dependent Variable). Table 6

Number of entrepreneurial development programmes (EDP) attended = 2.674 - .138* men perform better than women in high level positions - .083* men solve problems with logical analysis -.107* meetings are effective chaired by men -.150* importance of professional career for men than for women + .265* solve organisational problems require active approach.

Since R^2 value was .167, i.e. 16.7% of the variance in number of EDPs attended could be explained by men performing better than women in high level positions, men solved problems with logical analysis, meetings were effective chaired by men, importance of professional career for men than for women and solving organisational problems required active approach.

The standardised coefficient (Beta) for solving organisational problems requiring active approach was .376, which meant that, after controlling for other predictors a one (1) unit standard deviation (SD) increase in solving organisational problems requiring active approach would result in 37.6% increase in the number of EDP attended. The results were analysed to test the hypothesis impact of predictors on EDP attended. The ANOVA was significant (F= 59.939, d.f. (regression) =5, d.f. (residual) =1494, Sig. = 0.000) which meant that all the predictors collectively accounted for a statistically significant proportion of the variance in the criterion table. From the magnitude of the t-statistics ($t = 10.542$, $p < 0.01$) solving organisational problems through active approach accounted for the significant proportion of unique variance on the number of respondents attending EDPs.

Table 7: Regression Model (Difficulties in Expansion as Dependent Variable)

Dependent Variable			Difficulties in expansion				
Test of Independence by Durbin-Watson test			2.329				
Outliers			Min. -1.797 & max. 2.105				
R Square Value			.073				
F value of the model			23.701				
Significance			0.000 @ d.f. (regression 5), (residual 1494)				
Coefficients							
Predictors (Independent Variables)	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	co linearity statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.556	.135		11.546	.000		
Men perform better than women in high level positions	.030	.044	.025	.675	.500	.459	2.177
Men solve problems with logical analysis	.278	.055	.227	5.034	.000	.306	3.264
Meetings are effective chaired by men	-.155	.054	-.133	-2.859	.004	.285	3.504
Importance of professional career for men than for women	.217	.054	.166	4.038	.000	.366	2.733
Solving organisational problems require active approach	-.028	.046	-.022	-.596	.551	.439	2.276

No multicollinearity was assumed for the independent variables. The independence assumption was satisfied as the value of Durbin-Watson was equal to 2. The table depicted that the result lay between the internal i.e., minimum was -1.797 and maximum was 2.105 resulting in no outliers.

Regression Model (Difficulties in Expansion as Dependent Variable). Table 7

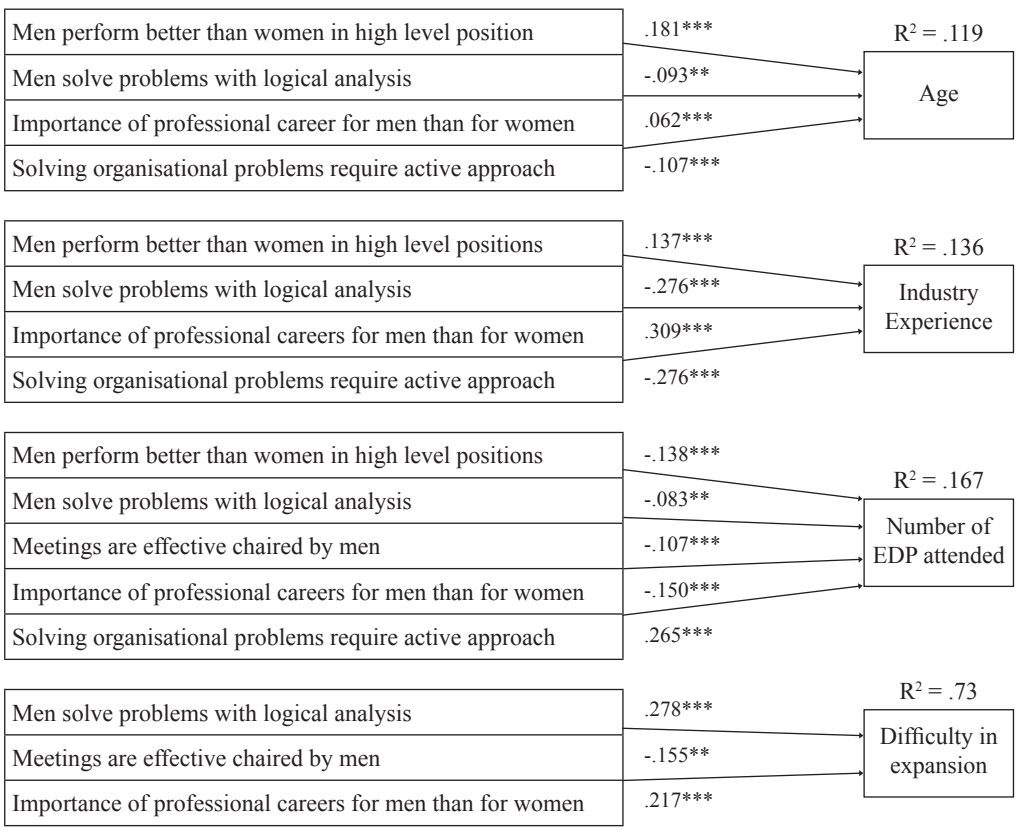
Difficulties in expansion = 1.556 + .278* men solve problems with logical analysis -.155* meetings are effective chaired by men +.217* importance of professional career for men than for women.

Since R^2 value was .073 indicating that 7.3% of the variance in difficulties in expansion could be explained by men performing better than women in high level positions, men solved problems with logical analysis, meetings were effective chaired by men, importance of professional careers for men than for women and solving organisational problems required active approach.

The standardised coefficient (Beta) for men solving problems with logical analysis was .227 indicating that after controlling other predictors a one (1) Standard Deviation

(SD) increase in men solving problems with logical analysis would result in a .227 increase in the difficulty of expansion of respondents. The results were analysed to test the hypothesis impact of predictors on difficulty in expansion. The ANOVA was significant (F= 23.701, d.f. (regression) =5, d.f. (residual) =1494, Sig. = 0.000) which meant that all the predictors collectively accounted for a statistically significant proportion of the variance in the criterion table. The t-statistics (t = 5.034, p<0.01) indicated a significant proportion of unique variance for difficulty in expansion, but the results were insignificant for men performing better than woman in high level position (t = .675, p>0.05) and for solving organisational problems requiring active approach (t = -.596, p>0.05).

Proposed Research Model



***Parameter estimates were significant at the 0 .05 level*
****Parameter estimates were significant at the 0.001 level*

Conclusion

Femininity/masculinity orientations had a correlative relationship with entrepreneurial orientations and entrepreneurial potentials. Within each society, men's culture differed greatly from women's culture. Although men and women could often performed the same duties from a technical standpoint, there were often symbols to which each gender had a different response. In situations where one gender responded in an alternative manner to their prescribed roles, the other gender might not even accept such deviant gender roles. The level of reactions experienced by people exposed to foreign cultures could be compared similarly to the reactions of gender behaviours of the opposite sex. The degree of gender differentiation in a country depended primarily on the culture within that nation and its history.

A multiple regression approach was used to test/explain the impact of five independent (predictor) variables - "men perform better than women in high level position", "men solve problems with logical analysis", "meetings are effective chaired by men", "importance of professional careers for men than for women" and "solving organisational problems requires active approach"- on the four dependent variables, namely Age, Industry experience, the number of Entrepreneurship Development Programmes attended and Difficulty in Expansion. The predictors were analysed using multiple regressions.

In the dependent variable Age, B weight for importance of professional career for men than for women which meant that, after controlling other predictors a unit increase in importance of professional career for men than women correlated with an increase in the Age of respondent. From the magnitude of the t-statistics, "men perform better than woman in high level positions" accounted for the significant proportion of unique variance on respondents' Age. "Meetings are effectively chaired by men" were found to be insignificant while the rest of the other predictors were found to have a significant impact on age of respondents. With reference to change in the Age of the entrepreneurs there was a strong feel that male were better than female in performance & had higher career prospects.

In the second dependent variable, Industry experience, B weight for "Importance of professional career for men than for women" which, after controlling other predictors,

a unit increase of "Importance of professional career for men than for women" would correlate with an increase in industry experience. The model was significant, from the magnitude of the t-statistics, Men problem solving, performance, importance of profession career & active approach by men all contributed significantly towards entrepreneur's industrial experience.

In the dependent variable, the number of EDPs attended, it was shown that B value for "Solving organisational problems requires active approach", after controlling for other predictors, that a unit increase in this variable would result in an increase in the number EDP attended. The model was significant and from the t-statistics magnitude the model was significant and the regression coefficients were also significant. All five predictors contributed significantly toward EDPs attended.

In the last dependent variable, Difficulty in Expansion, B weight for "Men solve problems with logical analysis", after controlling other predictors, showed that a unit increase in this variable would result in an increase in Difficulty in Expansion. The predictors, "Men problem solving skill", "Importance of professional career for men than for women", "Meetings are effectively chaired by men" all had significant impacts on Difficulties in Expansion by the entrepreneurs.

The impact of gender dominance predictors on entrepreneurial development attributes indicated there was a strong role of gender in entrepreneurial development. This study indicated that males possessed better entrepreneurial traits than females. While gender identity might sometimes be more important than gender in determining outcomes, it was also possible for one's gender (male or female) and one's gender identity (masculine or feminine) to interact with each result in different displays of behaviour.

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“The great end of life is not knowledge but action.”

– Thomas H. Huxley

Is there a 'Technological Gap' Between the Public and Private Sector Banks in India? A Metafrontier Approach

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Abstract

The Indian banking sector had been reforming with gathering pace since the 1960s. Most previous studies focused on the analyses of financial performance but the last two decades saw research on the analysis of efficiency. The present investigation looked into the 'technological similarity' among the sample of public and private sector banks. For this empirical study, the researcher chose 38 banks (24 public banks and 14 private sector banks) covering the period 2010 to 2015. This application-based study sought to identify whether there was a 'technological gap' between the two categories of banks. For the purpose, the Metafrontier Data Envelopment Approach was used to compare the relative efficiency of Indian public and private sector banks. The results indicated that although the banks did not seem too much impacted by the financial crisis, their low efficiencies below the frontier level pointed to the need for efficiency improvement measures and actions.

Keywords: Banking, Technological gap, Efficiency, Metafrontier DEA

Introduction

A bank is a financial institution providing banking and other financial services (such as accepting deposits and providing loans) to their customers. They form a dominating subset of the financial services industry in any country. The role of banking in strengthening the economy of any country and giving a boost to its growth is well-known. Indian banks, supported by governmental and banking regulatory agencies, can usefully facilitate balanced growth of industry so that it caters to the need of all sections of the society and all parts of the country. The sector in India was been able to withstand the effects of the 2008 crisis in contrast to failures of banking systems in a few major economies of the globe. The country's banking system exhibited relatively healthy performance. One of the major reasons was the soundness of the banks, as measured by the yardsticks of efficiency, productivity, profitability and stability. The main goal of banks today would be to maintain stability and to ensure they are impervious to external shocks. Some important parameters of the banking industry during the recent years are given in the table below.

Table 1: Indian banking industry at a glance

Particulars	2014-15	2013-14	2012-13
Total assets (Rs. bn.)	120,342	109,759	95,900
ROA (%)	0.80	0.80	1.00
ROE (%)	10.4	10.7	13.8
NIM (%)	2.6	2.7	2.6
Gross NPA %	4.3	3.8	INA
Net NPA %	2.4	2.1	2.2

Source: RBI

A quick examination of the statistics in the above table points to the huge size of the banking industry and the rate at which it was rising in the recent years. It is worth noting that though the private banks had been operating for more than three decades, more than 75% of the assets were with the public banking sector. Nevertheless, in spite of the dominance of the public sector banks, the private sector showed superiority in a higher return on assets which was almost four times higher than that of public banking sector (Kumar, Krishna and Bharadwaj, 2016). A noticeable aspect in their growth trajectory was a convergence in performance between the two sectors between 1994 and 2011, followed by a growing divergence in the recent crisis. In connection with this, it should be pointed out that though both the sectors faced the negative effects

of rising NPAs, the public banks were worse off. On the whole, the banks performed dismally, in terms of the rising NPA percentage during the period. The gross NPA of scheduled commercial banks was close to Rs. 3 lakh crores. The profitability ratios were on the downward trend due to the need to maintain higher provisioning as per RBI's regulations. This scenario formed the background for this study's attempt to understand the efficiency level of the selected banks.

Literature review

Battese et al. (2004) carried out an efficiency study of the Indonesian garments industry using a metafrontier approach on the assumption that there existed a difference in the technology set between the different regions in the country. Bos and Schmiedel (2003) studied 500 large commercial banks across eight countries in Europe for the period 1993 to 2000, using the metafrontier DEA approach. The study looked into efficiency trends on a cross-country basis. The meta analysis showed that United Kingdom and Belgium banks were the most efficient, whereas German and French banks were the least efficient. Bos and Schmiedel (2006) looked into the efficiency of 5000 large commercial banks in major European markets spanning across 15 countries for the period 1993 to 2004. Casu and Zhao (2013) studied the Indian banking industry for the period 1992-2009 to assess the impact of regulatory reform on productivity growth. They used the metafrontier DEA to look into the effects of ownership differences on technology and discovered the dominance of technological progress in productivity growth. The study also revealed the greater competitiveness of foreign banks. A number of studies were carried out based on the assumption of technological homogeneity (Sathye, 2003, Sensarma 2006, Das and Ghosh 2006, Ray and Das, 2010 and few others). Other studies assumed heterogeneity in the technological environment and applied appropriate methodology. Donnell et al (2008) investigated a cross-country efficiency analysis spanning across 97 countries covering Africa, America, Asia and Europe for the period 1986 to 1990. He used the metafrontier approach under the assumption of different technology sets owing to differences in the infrastructure, resource support and the economic environment. Similarly, Garcia (2011) studied the Mexican banking sector to identify the determinants of efficiency for the period 2001-2009. The overall efficiency in the industry was 85% with the average managerial efficiency and scale efficiency being 71% and 86% respectively. The trend analysis showed an initial rise during the initial years followed by a decline during the latter

part of the study period. With respect to the determinants, the positive factors were loan intensity, foreign ownership and GDP growth whereas the negative factors were non-interest expenses, proportion of poor loans and inflation rate. Johnes et al. (2012) completed a comparison study between the conventional banks and Islamic banks during the financial crisis period and also pre- and post- crisis. The analysis on 252 banks spread across 18 countries during the period 2004 to 2009 covered 207 commercial banks and 45 Islamic banks. The output oriented DEA results, using the intermediation approach, revealed an insignificant difference in the mean efficiency of the two groups of banks. The further investigation into the effect of macro variables showed the negative effect of industry concentration and market capitalization in contrast to the positive effect of GDP growth. Naceur et al. (2011) analysed the effect of financial sector reforms on the banking efficiency of a sample banks of Middle East and North African countries. The metafrontier DEA result showed that Morocco and Tunisia were more efficient than Egypt and Jordian banks. The cross-country research revealed that the top two countries had an annual efficiency average of 95.2% and 92.3% respectively. But, the metafrontier results showed a substantial decrease with the top two regions revealing a mean of 85.5% and 85.4% respectively. The overall trend showed an increase during the early years of the study. Phuong et al. (2015) studied the Vietnamese banking sector and investigated the impact on the industry since its entry into the World Trade Organisation. The five-year analysis from 2007 to 2012 revealed the dominance of the state banks compared with the private and foreign banks. Moreover, the state-run banks showed their relative more proximity to the metafrontier than the other two sectoral banks. San et al. (2011) showed the dominance of the public sector banks in Malaysia for the period 2002-09. The mean efficiency was 97.81% which surpassed the foreign banks (94.92%). Furthermore, the regression results using the Tobit model showed the significant influence of loan quality and capital adequacy at even 1% level. Soetanto and Ricky (2011) looked into the performance of 20 domestic commercial banks of Indonesia for the period 2004-09, mainly covering the pre-crisis period. The results using DEA showed that the average technical efficiency was 89.5% with the minimum and maximum scores to be 80.4% and 92.5% respectively. The investigation revealed that scale efficiency was mainly responsible for pulling down the overall efficiency. Thilakaweera et al. (2015) analysed the performance of the banking sector in Sri Lanka before and after the political crisis involving the Sri Lankan government and LTTE forces. Results showed an insignificant difference between the public sector and foreign banks in the post-conflict period, but the post-conflict efficiency was higher than for the pre-

conflict period.

Some of the pertinent studies made on the Indian banking sector included those by Gupta, Doshit and Chinubhai (2008), Bala and Kumar (2011), Chhikara and Bhatia (2012), Goel and Bajpai (2013), Gulati (2011), Sinha and Khan (2014) among others.

The present study focused on the banking industry of India. Given that very few studies had been conducted to test the efficiency results using the metafrontier DEA approach, the researchers embarked on the present study with the aim of plugging an existing gap in terms of methodology and to determine the position of the industry through a study on 38 banks in India.

Objectives of the study

There were two objectives of the empirical study:

(i) To determine the relative efficiency level of the sample banks by applying the meta-frontier DEA approach.

(ii) To test the difference in the results obtained using DEA and meta-frontier DEA.

Research design

The study focused on the efficiency aspect of a sample of the larger banks. The metafrontier approach with data envelopment analysis (DEA) was used. The variables chosen were based on an examination of earlier Indian and foreign studies. The intermediation approach was applied, with deposits and borrowings as input variables, and investments and outputs as the outputs.

DEA is a non-parametric method, to measure the relative efficiency of organisations (referred to as decision-making units or DMUs). The basic concept is that it creates a frontier by the piecemeal addition of DMU frontiers which acts as an envelope of the sub-frontiers. The organisations that lie on the frontier have an efficiency of one, whereas those within the envelope have a score of less than one. The distance of an organisation's position from the envelope decides the relative efficiency. In this

approach, the basic assumption is the uniformity of conditions that the organisations face, thereby pointing to technological uniformity. However, in this competitive era, due to regulatory impositions, differences in automations and technological up-grading, etc., it is not necessary that all organisations face the same or similar technological conditions. As a result, in such a situation, the metafrontier DEA is a better fit. With this in mind and looking at the different technological developments between public and private sector banks together with the kind of government that the former category gets, it is better to assume that the banks face different conditions because of the heterogeneity of the operating environment.

In this approach a metafrontier is the boundary of an unrestricted technology set. Thereafter, efficiency is computed using two reference boundaries which are (i) with respect to the 'group' frontier that is arrived at using the data set of DMUs falling into that group that gives the 'group' efficiency result and (ii) with respect to the frontier combining the data set of the DMUs in the different 'groups' combined, which gives the 'meta efficiency'. Thus, the metafrontier result is arrived at by combining 'N' group frontiers where 'N' is the number of different clusters (or groups). The importance of this improved version of the DEA is that it helps to identify the technological gap in relation to the technology available to all the clusters combined. Thus, it helps to identify the potential improvement that can be made by a DMU. The gap which is measured as a ratio is the result arrived at by dividing the meta efficiency score by the group frontier score. The results of the efficiency are bounded between zero and one.

The large-sized banks in terms of assets were selected. The study was based on an analysis of thirty eight banks comprising of twenty four public sector banks and fourteen private sector banks.

The study was carried out for the post-crisis period from 2010 to 2015.

Analysis and findings

This section gives details of the statistical analysis producing the metafrontier efficiency and group efficiency results, as well as the technological gap ratio analysis.

Descriptive statistics

We computed the basic statistics for the sample chosen.

Table 2: Descriptive statistics of the variables: 2010 to 2015

Statistic	*Deposits*	*Borrowings*	*Investments*	*Advances*
Mean	169,874.7	19,578.8	55,927.2	131,959.7
Standard Error	13,721.9	2,208.0	4,280.9	11,343.5
Median	109,422.6	77,71.5	36,663.4	76,551.8
Standard Deviation	207,195.9	33,340.4	64,640.1	171,283.6
Kurtosis	18.0	12.2	15.4	20.5
Skewness	3.7	3.4	3.4	4.0
Minimum	4,787.3	40.1	2,017.9	3,459.7
Maximum	1,576,793.2	205,150.3	49,5027.4	1,300,026.4

Source: Computed by the authors

The results clearly pointed to a wide variation in the different variables in the sample considered.

Metafrontier efficiency results

A metafrontier approach with data envelopment analysis (DEA) involved frontier computation using linear programming, given the assumption that the technology set in the banks was different.

Table 3 showed the metafrontier efficiency results for the two clusters of banks, 1 for public sector banks and 2 for private sector banks. Few banks attained a mean efficiency of one, which would indicate they remained efficient in all the years of the study. These high performing banks on the efficient frontier included public sector banks like Canara bank, State Bank of India and Indian Bank and its private competitors like City Union Bank, DCB Ltd., HDFC Bank, ICICI Bank and Kotak Mahindra Bank.

The trend over the years showed sound and stable performance by the banking sector with the efficiency lying in the range of 97.5% to 98.3%.

Table 3: Meta-frontier efficiency results for the study period

DMU	Cluster	2010	2011	2012	2013	2014	2015	Avg.
Allahabad Bank	1	0.985	0.957	0.941	0.963	0.989	0.975	0.968
Andhra Bank	1	0.949	0.975	0.971	0.981	0.949	0.991	0.969
Axis Bank Ltd.	2	0.998	0.973	0.992	1.000	1.000	0.957	0.987
Bank Of Baroda	1	0.986	0.992	1.000	1.000	1.000	1.000	0.996
Bank Of India	1	0.956	0.942	0.958	0.948	0.942	1.000	0.958
Bank Of Maharashtra	1	0.913	0.962	0.920	0.956	0.978	0.988	0.953
Canara Bank	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Central Bank Of India	1	0.952	0.936	0.977	0.960	1.000	0.956	0.964
City Union Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Corporation Bank	1	0.944	0.940	0.917	0.948	0.985	0.961	0.949
DCB Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Dena Bank	1	0.947	0.966	0.955	0.907	0.971	0.949	0.949
HDFC Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ICICI Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
IDBI Bank Ltd.	1	0.981	0.985	0.966	0.956	0.983	1.000	0.979
Indian Bank	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Indian Overseas Bank	1	0.947	0.945	0.944	0.952	0.935	0.911	0.939
IndusInd Bank Ltd.	2	0.926	0.928	0.933	0.963	0.986	0.974	0.952
Karur Vysya Bank Ltd.	2	0.993	1.000	0.967	0.969	0.973	1.000	0.984
Kotak Mahindra Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Oriental Bank Of Commerce	1	0.953	1.000	1.000	1.000	1.000	1.000	0.992
Punjab & Sind Bank	1	0.922	0.954	0.961	0.986	0.966	0.984	0.962
Punjab National Bank	1	0.996	0.975	0.972	0.997	0.996	0.965	0.984
State Bank Of Bikaner and Jaipur	1	1.000	0.996	1.000	0.987	1.000	1.000	0.997
State Bank Of India	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
State Bank Of Mysore	1	1.000	1.000	0.967	0.998	0.989	0.963	0.986
State Bank Of Travancore	1	0.995	0.988	0.940	0.977	0.981	0.982	0.977
Syndicate Bank	1	0.994	1.000	0.998	1.000	0.988	0.971	0.992
The Federal Bank Ltd.	2	1.000	1.000	0.975	0.989	0.995	1.000	0.993
The Jammu & Kashmir Bank Ltd.	2	0.954	1.000	1.000	1.000	1.000	1.000	0.992
The Karnataka Bank Ltd.	2	1.000	1.000	1.000	1.000	0.995	1.000	0.999
The Lakshmi Vilas Bank Ltd.	2	0.994	0.974	1.000	1.000	1.000	0.984	0.992
The South Indian Bank Ltd.	2	0.984	1.000	1.000	0.959	0.982	0.962	0.981
UCO Bank	1	1.000	0.940	0.937	0.957	0.954	0.935	0.954
Union Bank Of India	1	0.968	0.978	1.000	0.975	0.952	0.983	0.976
United Bank of India	1	1.000	0.938	0.942	0.942	1.000	1.000	0.970
Vijaya Bank	1	0.959	0.963	0.930	0.938	0.971	0.945	0.951
Yes Bank Ltd.	2	1.000	0.950	1.000	1.000	1.000	1.000	0.992
Mean		0.979	0.978	0.975	0.979	0.986	0.983	0.980

Source: Computed by the authors

Table 4 related to the sector-wise analysis of the metafrontier efficiency results. It showed a close competition between the two sectors in terms of their mean score over the 6 years period of study.

Table 4: Sector – wise analysis of MFE results

Sector	2010	2011	2012	2013	2014	2015
Public	0.973	0.972	0.967	0.972	0.980	0.977
Private	0.917	0.987	0.990	0.991	0.995	0.991

Source: Computed by the authors

For the public sector, the results remained stable with a good score of more than 97% relative efficiency. On the other hand, for the private sector, there was a substantial improvement from 91.7% in 2010 to 99.1% in 2015. Technological deployment by the private sector banks helped them to advance closer to the efficient frontier.

Group efficiency frontier results

By the term 'group frontier', we mean that only the DMUs of a particular (or cluster) are considered for the purpose of creating the efficient frontier. In our case, there are two clusters, the public sector and the private sector.

Table 5 showed that the overall performance of the individual sectors and the sector overall were both quite commendable. Out of 24 public sector banks, 5 attained a perfect score of one. The five included the SBI and one of its associate banks. The relative performance of private cluster showed that six of the fourteen banks attained a perfect score of one during the period. Moreover, a time trend analysis showed relatively stable and good performance during the period.

Table 5: Group frontier efficiency results for the study period

DMU	Cluster	2010	2011	2012	2013	2014	2015	Avg.
Allahabad Bank	1	0.985	0.976	0.999	0.974	0.994	0.985	0.986
Andhra Bank	1	0.949	0.979	0.974	0.991	0.973	1.000	0.978
Axis Bank Ltd.	2	1.000	0.983	0.992	1.000	1.000	0.957	0.989
Bank Of Baroda	1	0.986	0.994	1.000	1.000	1.000	1.000	0.997
Bank Of India	1	0.956	0.949	0.958	0.948	0.942	1.000	0.959
Bank Of Maharashtra	1	0.937	1.000	1.000	0.984	0.995	1.000	0.986
Canara Bank	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Central Bank Of India	1	0.952	0.951	0.978	0.982	1.000	1.000	0.977
City Union Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Corporation Bank	1	0.965	1.000	0.984	1.000	0.987	0.981	0.986
DCB Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Dena Bank	1	1.000	1.000	0.972	1.000	0.997	0.961	0.988
HDFC Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ICICI Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
IDBI Bank Ltd.	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Indian Bank	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Indian Overseas Bank	1	0.963	0.978	0.963	0.967	0.960	0.945	0.963
IndusInd Bank Ltd.	2	0.926	0.928	0.954	0.979	1.000	0.974	0.960
Karur Vysya Bank Ltd.	2	0.999	1.000	0.969	0.969	0.981	1.000	0.986
Kotak Mahindra Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Oriental Bank Of Commerce	1	0.954	1.000	1.000	1.000	1.000	1.000	0.992
Punjab & Sind Bank	1	1.000	0.975	1.000	1.000	1.000	1.000	0.996
Punjab National Bank	1	0.996	0.982	1.000	1.000	1.000	0.976	0.992
State Bank Of Bikaner and Jaipur	1	1.000	1.000	1.000	0.993	1.000	1.000	0.999
State Bank Of India	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
State Bank Of Mysore	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
State Bank Of Travancore	1	1.000	0.997	0.980	1.000	0.995	1.000	0.995
Syndicate Bank	1	0.994	1.000	0.998	1.000	0.988	0.977	0.993
The Federal Bank Ltd.	2	1.000	1.000	0.980	0.989	0.995	1.000	0.994
The Jammu & Kashmir Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
The Karnataka Bank Ltd.	2	1.000	1.000	1.000	1.000	0.995	1.000	0.999
The Lakshmi Vilas Bank Ltd.	2	0.994	0.974	1.000	1.000	1.000	0.984	0.992
The South Indian Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	0.962	0.994
UCO Bank	1	1.000	0.944	0.953	0.968	0.975	0.949	0.965
Union Bank Of India	1	0.968	0.988	1.000	0.986	0.976	0.988	0.984
United Bank of India	1	1.000	0.978	0.980	1.000	1.000	1.000	0.993
Vijaya Bank	1	0.982	1.000	1.000	0.963	0.980	0.970	0.983
Yes Bank Ltd.	2	1.000	0.951	1.000	1.000	1.000	1.000	0.992
Mean		0.987	0.988	0.990	0.992	0.993	0.990	

Source: Computed by the authors

Technological gap ratio (TGR) analysis

This third important aspect of the analysis helped to determine the extent of potential technological improvement. The basic fundamental concept of the TGR was that it looked into the relative efficiency of a bank by clubbing all clusters together in order to arrive at the best technology that was available taking different groups together. A score of one denoted that the organisation was practicing the best technology set, whereas a less than one score indicated there was scope for technological improvement. Results showed that five public sector and eight private sector banks attained a score of one. In other words, they were operating with the best technology set available to the industry. For the others, there were opportunities for improvement that would help them to reduce the distance and the DMU will also lay on the efficient frontier.

Table 6: Technological gap ratio results

DMU	Cluster	2010	2011	2012	2013	2014	2015	Avg.
Allahabad Bank	1	1.000	0.981	0.942	0.989	0.995	0.990	0.983
Andhra Bank	1	1.000	0.996	0.997	0.990	0.975	0.991	0.992
Axis Bank Ltd.	2	0.998	0.990	1.000	1.000	1.000	1.000	0.998
Bank Of Baroda	1	1.000	0.998	1.000	1.000	1.000	1.000	1.000
Bank Of India	1	1.000	0.993	1.000	1.000	1.000	1.000	0.999
Bank Of Maharashtra	1	0.974	0.962	0.920	0.972	0.983	0.988	0.967
Canara Bank	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Central Bank Of India	1	1.000	0.984	0.999	0.978	1.000	0.956	0.986
City Union Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Corporation Bank	1	0.978	0.940	0.932	0.948	0.998	0.980	0.963
DCB Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Dena Bank	1	0.947	0.966	0.983	0.907	0.974	0.988	0.961
HDFC Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ICICI Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
IDBI Bank Ltd.	1	0.981	0.985	0.966	0.956	0.983	1.000	0.979
Indian Bank	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Indian Overseas Bank	1	0.983	0.966	0.980	0.984	0.974	0.964	0.975
IndusInd Bank Ltd.	2	1.000	1.000	0.978	0.984	0.986	1.000	0.991
Karur Vysya Bank Ltd.	2	0.994	1.000	0.998	1.000	0.992	1.000	0.997
Kotak Mahindra Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Oriental Bank Of Commerce	1	0.999	1.000	1.000	1.000	1.000	1.000	1.000
Punjab & Sind Bank	1	0.922	0.978	0.961	0.986	0.966	0.984	0.966
Punjab National Bank	1	1.000	0.993	0.972	0.997	0.996	0.989	0.991
State Bank Of Bikaner and Jaipur	1	1.000	0.996	1.000	0.994	1.000	1.000	0.998
State Bank Of India	1	1.000	1.000	1.000	1.000	1.000	1.000	1.000
State Bank Of Mysore	1	1.000	1.000	0.967	0.998	0.989	0.963	0.986

State Bank Of Travancore	1	0.995	0.991	0.959	0.977	0.986	0.982	0.982
Syndicate Bank	1	1.000	1.000	1.000	1.000	1.000	0.994	0.999
The Federal Bank Ltd.	2	1.000	1.000	0.995	1.000	1.000	1.000	0.999
The Jammu & Kashmir Bank Ltd.	2	0.954	1.000	1.000	1.000	1.000	1.000	0.992
The Karnataka Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
The Lakshmi Vilas Bank Ltd.	2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
The South Indian Bank Ltd.	2	0.984	1.000	1.000	0.959	0.982	1.000	0.988
UCO Bank	1	1.000	0.996	0.983	0.989	0.978	0.985	0.989
Union Bank Of India	1	1.000	0.990	1.000	0.989	0.975	0.995	0.992
United Bank of India	1	1.000	0.959	0.961	0.942	1.000	1.000	0.977
Vijaya Bank	1	0.977	0.963	0.930	0.974	0.991	0.974	0.968
Yes Bank Ltd.	2	1.000	0.999	1.000	1.000	1.000	1.000	1.000
Mean		0.992	0.990	0.985	0.987	0.993	0.993	

Source: Computed by the authors

Table 7 shows the results of the Levene's test.

Table 7: Significance of 'technology' similarity among the category of banks

Independent Samples t-test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
VAR01	Equal variances assumed	7.102	.008	-2.346	226	.020	-.00531	.00226	-.00977	-.00085
	Equal variances not assumed			-2.404	187.052	.017	-.00531	.00221	-.00966	-.00095

Source: Computed by the authors

The basic idea was to determine whether there was any significant difference in the efficiency scores obtained by combining two clusters and considering two clusters separately. The test result indicated a significant difference in the efficiency scores, thereby justifying even more strongly the suitable application of metafrontier DEA.

Conclusions

The present study analysed an important aspect of the banking industry in India. The application of DEA showed that even in the post-financial crisis period where the global economy was moving very slowly and the chances of a real turnaround looked sluggish, the sector continued to move strongly forward. It showed the resilience of the sector in being able to handle shocks emerging from the external developments and rising non-performing loans. The flow of credit remained slow, given an anaemic revival of the global and the domestic economy. There had not been any euphoric signs of growth in the core and non-core industries which would give a boost to infrastructural development and capital formation in the economy. The study on efficiency aspects showed that both the public and the private sector banks did well during the period, competing neck to neck. The use of metafrontier analysis added valuable insight to a better understanding of how the differences in a bank's technological infrastructure and the support provided affected the level, efficiencies and quality of their operations and the customer care management.

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“A man only learns in two ways, one by reading and the other by association with smarter people.”

– Will Rogers

Predicting the Success of Mergers and Acquisitions in Manufacturing Sector in India: A Logistic Analysis

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Abstract

Mergers and acquisitions (M&As) are significant corporate restructuring activities that attract the attention of shareholders as they focus on wealth creation. Such transactions are considered as very risky and challenging and at the same time very important company investment decisions. Empirical research academicians are keen to know whether mergers and acquisitions as investment transactions lead to the creation or destruction of company value. To date, few studies have analysed the determinants for predicting the success and failure of mergers and acquisitions in India. This paper attempted to use logistic regression to find out the probability of post mergers and aquisitions success or failure of manufacturing companies in India.. The period of study was from 2000 to 2008 for M&A deals during 1997 to 2011. In the study, the rate of EVA (economic value added), considered as a better measure of performance, was used as dependent variable and the independent variables used were M&A experience, size of acquirer, pre-M&A current ratio, quick ratio, return on asset, return on capital employed, return on net worth, net profit margin, asset turnover ratio, and interest coverage ratio. The study found that the probability of a given firm being successful after M&A increased as the pre-M&A current ratio, net profit margin decreased; while its pre-M&A quick ratio and asset turnover ratio increased. It was also estimated that the Z score below 0.02 in the case of M&A would indicate the company was probably headed for failure, while companies with scores above 0.02 were likely to be successful.

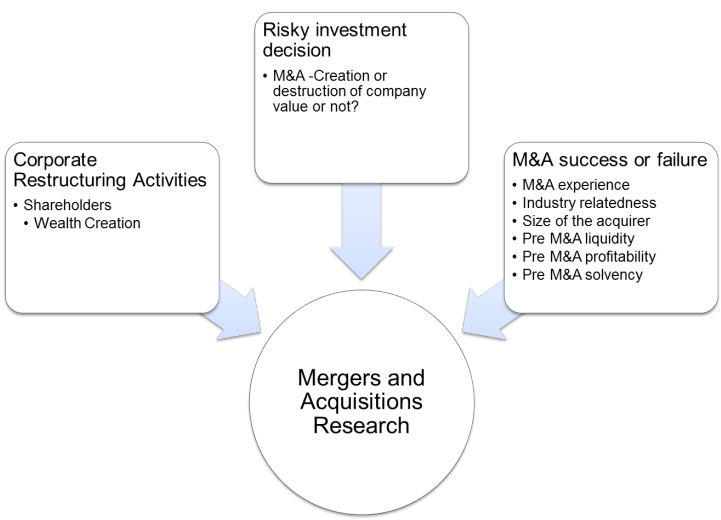
Keywords: Mergers and Acquisitions, Logistic Regression. Economic Value Added, Indian Manufacturing Companies

Introduction

Mergers and acquisitions are significant corporate restructuring activities which attract attention among shareholders as they focus on wealth creation. Transactions involving M&A deals are considered as very risky and challenging and such transactions are regarded as very important company investment decisions. They provide tremendous opportunities for researchers to examine, observe and analyse the implications and effects on the value of shareholders wealth. In particular, empirical research academicians are keen to know whether mergers and acquisitions would finally lead to the creation or destruction of company value. M&A success or failure is influenced by a number of factors, including M&A experience, industry relatedness, the size of the acquirer, pre-M&A liquidity, pre-M&A profitability, and pre-M&A solvency. To date, few studies have been carried out to find out the factors that can predict M&A success or failure. This study sought to analyse the determinants for predicting the success and failure of mergers and acquisitions in India.

This study used the logistic regression model to examine a sample of four hundred and seven (407) successful and unsuccessful firms involved in mergers and acquisitions. The findings may provide useful evidence and guidelines for companies considering the M&A strategy as a means for corporate success. Companies looking for future M&A candidates to increase their global competitiveness may want to include those which have been successful in mergers and acquisitions in the past.

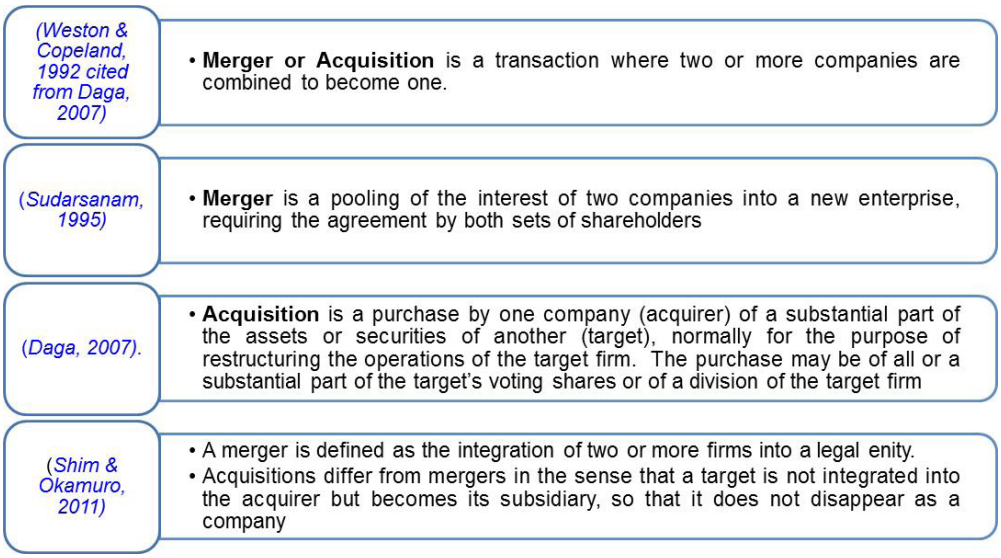
Figure 1: Rationale of the current research



Concept of Mergers and Acquisitions

According to the CMIE Prowess data base, acquisitions are the takeover transactions where an acquirer company takes over a substantial part of shares of another (target) company. Alternatively, acquisitions are those where a company is being targeted for substantial acquisition of shares by another (acquirer) company. Mergers are transactions where an acquirer company is seeking merger with another company or a target company is being merged into another company.

Figure 2: Mergers and Acquisitions – Definitions

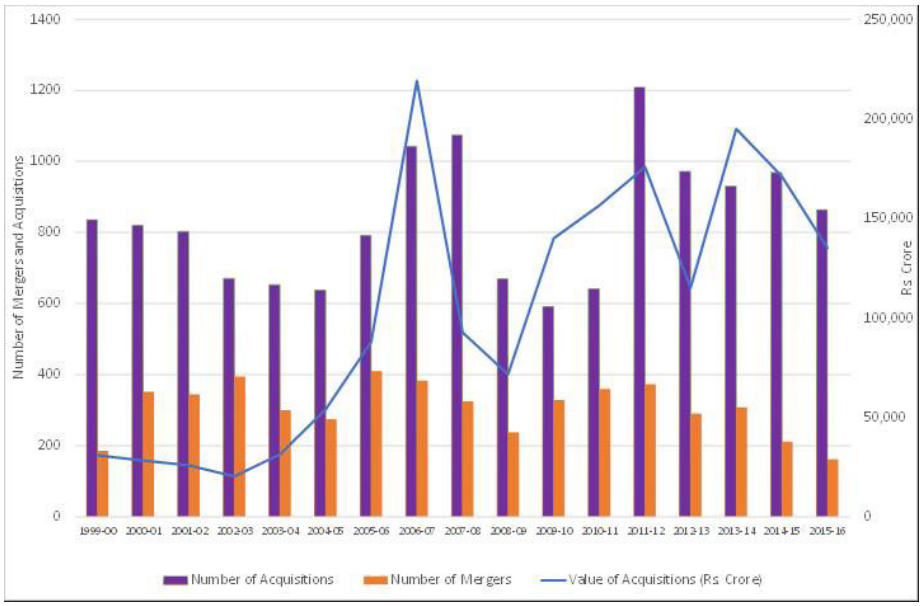


Review of Literature

Mergers and acquisitions had seen substantial growth in corporate India. From 1999-2000 to 2015-16, there were 5,236 merger deals, with 14,181 acquisitions amounting to more than Rs. 17,400 billion. But did mergers and acquisitions help improve performance of companies? The answer seemed to be mixed.

This section covers a review of the literature on post M&A performance keeping in mind the growing importance of M&A in recent times.

Figure 3:Volume and Value of Mergers and Acquisitions deals announced in India



Source: Economic Outlook, CMIE

Summary of Studies on Post M&As Performance

There are three possible outcomes in company performance, namely value created, value conserved, and value destroyed (Bruner, 2004). Do mergers and acquisitions create or destroy value? A literature review was carried out on studies relating to post merger corporate financial performance. These researches were largey done in USA & UK, with some on Malaysia, Japan, Australia, Greece, and Canada, and a few on India. Many studies focused on the effects of mergers and acquisitions on share prices, shareholder wealth, and the pre-and post-merger operating and market performance of the target and acquirer firms. These did not provide conclusive evidence whether they enhanced efficiency or destroy wealth and were mainly discussions on whether M&A led to a increase or a decrease in business performance. Most studies looked at post M&A performance using traditional financial parameters.

Abirami, K. (2017) suggested that banks had improved efficiency and increased the shareholders value through strategic mergers. Leepsa & Mishra (2012a) found that the post-merger financial performance of selected manufacturing companies in India showed improvements in company liquidity, decreased networking capital/

sales, increased debt ratio and interest coverage ration but these were not statistically significant. The profitability position of the companies has increased in terms of return on capital employed and decreased in terms of return on net worth, both statistically significant. The financial performance of the companies' improved after the merger in terms of current ratio, quick ratio, return on capital employed, interest coverage ratio, though, mostly not statistically significant. Romero-Martínez et al. (2017) found that structural and human integration and the decision on the right momentum and integration speed played an important part in merger success. Leepsa (2012e) considered the merger motives, trends and post-merger performance of electricity companies in India. M&A deals in the sector were highly regulated and important for corporate survival.

Veena & Pathi (2017) found that after merger there were positive improvements in net profit, operating profit, total income, earning per share, deposits, loans and advances, borrowings, investments, total assets and other income. Leepsa (2012b) made an empirical analysis on post-acquisition performance of Indian manufacturing companies and found that acquirers of relatively larger companies had performed negatively. There was no difference in performance if the companies were segregated into related and unrelated acquisitions. Both had negative returns in the post-acquisition period. Generally, the larger the size of the acquirer company, the larger the loss to their shareholders. Leepsa & Mishra (2013b) investigated wealth creation through acquisitions. Seven (7%) percnt improved in company performance, seventeen (17%) showed negative returns, with the remaining seventy-six (76%) percent showing indifferent returns.

The merger helped in revenue increase and cost decrease. Leepsa (2012d) also observed the merger performance of the deal between SAIL (Steel Authority of India Ltd) and MEL (Maharashtra Elektrosmelt Ltd) and found SAIL's profitability, liquidity, and solvency had improved after the merger.

In spite of the evidence suggesting that most merger deals failed in creating value for the shareholders, companies still went for M&A.

Industry ratios (operating cash flow/total assets) were used as benchmark indicators of merger success or failure. (Healy et al.,1992). Bierich (1988) defined success as the

degree of goal achievement (Brouthers, et al.,1998). The success or failure depended upon the objective or goals for which the M&A deal were done. If acquisitions could not meet the goals set, then it would be considered a failure (Rosenzweig, 2006). A merger was successful if it increased the total current wealth of the owners of the acquiring firm. There were no agreement in the literature on what percentage of change would constitute merger success, but there was general concensus that in mergers and acquisitions any positive increase meant success and any negative change meant failure and no change meant no impact. (Kumar & Rajib, 2007). According to Richards (1978), a goal was a planned position or result to be achieved. To judge the success of business combination, it must be clear whose goals were to be followed and what these goals were specifically called (Bosecke, 2009). Failure was defined as the eventual sale and liquidation of business, inability to meet or exceed financial objectives, not achieving the strategic objectives (DePamphilis, 2010).

Most of the studies defined the success or failure of M&A as economic outcomes through the financial performance of firms. The reason was that performance should be measured not only in financial terms but also in non-financial terms. Thus, one could conclude that it was not only the economic and financial outcome of an M&A that defined success or failure but also the attainment of objectives for which a deal was made showed the success and failure of M&A. Compared to other performance parameters, economic and financial outcomes were used in most of the studies because this was the basic objective behind any company going for any M&A deals.

In a nutshell, it was observed that company performance after M&A were situational and the performance varied accordingly, influenced by different factors relating to M&A. Leepsa & Mishra (2016b) reviewed past studies on the post M&A performance of manufacturing firms in India, looking at the performance of firms during post mergers and acquisitions period. Based on relevant papers published between 1974 and 2015 relating to manufacturing firms, the review focused on the traits of M&A performance such as financial performance, human resources issues, corporate governance characteristics, ownership structure, cross border issues, cultural factors, merger waves, business cycle, type of M&A deal, and type of industry of acquirer and target firm. This review revealed that certain aspects of M&A performance in India were not touched. There was thus the need to understand which factors would lead to successful or unsuccessful mergers and acquisitions in manufacturing companies in India.

Summary of Studies on Logistic Regression and M&As

Numerous M&A studies used different models such as ordinary least square regressions or linear regressions, multiple regressions, for analyzing the influence of different factors on M&A performance. A few studies used logistic regression analysis, including those by (Walkling, 1985); (Sorensen, 2000); (Pasiouras, et al., 2011); (Yuzbasioglu, 2002); (Tsakani's, et al., 2006); (Brueckner, 2007); (Kumar & Rajib, 2007); (Agrawal & Sensarma, 2007); (Khoranaa, et al., 2007); (Basu, et al., 2008); (Wang & Branch, 2009); (Branch & Yang, 2010); (Chen, et al., 2009); (Ronnholm, 2010);(Mahmood, et al., 2011); (Banerjee, et al., 2012); (Beccalli & Frantz, 2012); (Alzueta & Lucey, n.d.).

Ali & S.Gupta, n.d. used logistic analysis to predict the success and possibility of the occurrence of a tender offer, takeover or merger event and investigated the key fund-specific factors and industry level factors in determining M&A activity. They also used the tool to identify the characteristics of merging firms and factors that discriminated between the target and bidders in M&A in India and to predict the merger and takeover success and performance of risk arbitrage and sweetened offers in hostile takeovers.

However, there was scarce literature using logistic regression to predict the result of M&A. Logistic regression is the extension of the multiple regression analysis technique and works on the same principle as of linear regression. In linear regression the dependent variable or the outcome variable is continuous in nature while in logistic regression the outcome variable is binary or dichotomous in nature. It estimates the coefficients through a probabilistic method based on maximum likelihood. This means logistic regression is free from the underlying assumption of normality and equal variance of population. Logistic regression provides the conditional probability of an observation belonging to a certain class, given the values of independent variables (co-variates) for the observation. It is based on a cumulative probability function and does not require the multivariate normality of the co-variates. It incorporates nonlinear effects and wide range of diagnostics (Yuzbasioglu, 2002).

The likelihood ratio indices provide an indication of the overall explanatory power of the models and similar to R^2 statistic of multiple regressions. A lower likelihood index indicates a lower proportional reduction in error rate. A positive sign on a parameter, co-efficient indicates that an increase in the associated variable increases the likelihood of success of M&A. On the other hand, a negative sign decreases the likelihood.

Summary of Studies on Economic Value Added as a Performance Measure

Traditional accounting measures have been criticised as unsatisfactory performance measures as they are deficient in directing towards the goal of shareholder wealth maximization. Performance measures relating to profitability ignore the cost of capital which is essential for determining value creation for shareholders. Sometimes in certain situations, even if a company gets positive net income as well as higher accounting rate of return, there might be a decline in shareholder wealth. Earnings might be lesser than the required rate of return that shareholders could have earned by investing in other investment opportunities of similar risk. In the backdrop of limitations of old measures of performance, Economic Value Added (EVA) is considered as a better performance metric. EVA is essentially the difference between profit earned by the company and the cost of capital. Leepsa & Mishra (2016a) studied the performance of the acquirer in the manufacturing sector through the analysis of the EVA in different industries of the manufacturing sector in India. The author mentioned that most companies had negative EVA, implying that they were not able to earn more than the cost of capital compared to the amount of capital added into the business.

The idea of EVA might be new but the concept is age old. In contemporary economics and finance literature, EVA plays an important role in business performance measurement. In corporate finance, EVA is an estimate of a firm's economic profit – being the value created in excess of the required return of the company's investors (being shareholders and debt holders).

(Stewart, 1991) defines EVA as a performance measure which is the difference between the operating profits of the company and the cost of all the capital employed to earn that operating profit. It is the only performance metric that is linked with intrinsic market value. EVA increases in three cases (a) if the operating profits of the company are increased by the same capital (b) Suppose furthermore new capital is invested, then the project must earn more than the old and new capital invested (c) when capital is separate from business to other profitable opportunities, since it didn't bring an adequate amount of returns to a business. If the EVA is positive then the company has added value to the company for the cash outlay it has made in bringing the resources to firm. If the EVA is negative then value is destroyed. EVA is both a measure of value and of performance. It is the accurate performance metric to appraise company performance.

Roztocki & Needy (1999, p1) suggested EVA as a single and simple measure that gave a real picture of shareholder wealth creation.(Hawawini, et al., 2003); . (Schuster & Jameson, 2003) used different names for the same concept of residual income such as Economic Value Added (EVA) and Market Value Added (MVA), Economic Profit, Cash Value Added, or Added Value to reflect residual income or the best measure of shareholder value.Ghani et al (2005); Drucker (1995); Marshall (1890); Bidle & Bowne (1999); Ray (2012); Solomon (1965) suggested EVA was the real profit of a company, calculated by deducting all expenses or losses from all revenues or gains including the opportunity cost of capital. (Mohanty, 2006). A firm earned true profit only if it earned more than the investors expected. (Yao, et al., 2009, p42) found that EVA gained importance in the corporate and investment world as the more current yardstick for company performance Xiao and Tan (2009) found that EVA and rates of EVA were measures of performance that corrected any biasess due to differences or in accounting policies.

Research Gaps & Objectives

The literature review revealed that most studies on M&A used traditional performance measures and very few of these relate to post M&A performance in terms of economic profit, particularly in India.

Considering these research gaps, the objectives of this study examined the likelihood of a given manufacturing company in India being successful or unsuccessful after mergers and acquisitions.

Research Methodology

This study attempted to find out the probability of the manufacturing companies in India being successful or unsuccessful after mergers and acquisitions. The statistical tools and techniques used are discussed in this section.

Data Sources and Period of Study

The study investigated the pre and post M&A performance of manufacturing

companies in India that had gone for M&A deals during the period from 1st January 2000 to 31st December 2008. The data for analysis were collected from various sources such as CMIE Prowess, CMIE Business Beacon, Ace Equity database and Capitaline. The data available in the Business beacon database provided useful information on the volume and value of M&A deals announced in India. Data collected from Centre for Monitoring Indian Economy (CMIE) Prowess database were used to collect data about M&A deals as well as financial data on acquirer and target firms. The firms under analysis represented those where both acquiring and target firms belonged to manufacturing companies. The manufacturing sector was selected because the highest number of M&A deals were done in this sector. Taking M&A deals only from manufacturing sector would bring heterogeneity in the sample (Sorensen, 2000).

The data were further filtered to find out if financial data for both acquirer and target firm for three year before as well as after M&A event were available or not. This study used the long term period of three years to evaluate firm performance as a suitably long period was essential to investigate the impact of M&A, given that the effect of M&A was not felt immediately. (Healy, et al., 1992); (Rau &Vermaelen, 1998); (Ghosh, 2001); (Rahman & Limmack, 2004); Ramakrishnan, 2008). The final sample consisted of 407 M&A deals (290 merger deals and 117 acquisition deals).

Table 1 shows the sample of annual M&A as per the Type of Deal:

Table 1:Sample as per the Type of Deal

Year	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Total**
Merger	27	39	33	29	29	42	43	30	18	**290**
Acquisition	11	7	8	9	10	15	18	28	11	**117**
Total	38	46	41	38	39	57	61	58	29	**407**
Source: Compiled from CMIE Prowess Database										

The industry classification was made based on the CMIE Prowess industry classification categorising the manufacturing sector into nine industries as given in Table 2.

Table 2: Sample as per the Type of Industry of Acquirer and Target

Industry	Acquirer Industry			Target Industry		
	Merger	Acquisition	Total	Merger	Acquisition	Total
Chemicals	98	37	135	96	33	129
Diversified	18	6	24	3	2	5
Food and Beverage	39	17	56	44	15	59
Machinery	39	12	51	40	14	54
Metal and Metal Products	27	14	41	29	19	48
Miscellaneous Manufacturing	5	4	9	9	7	16
Non Metallic and Mineral Products	19	6	25	21	8	29
Textiles	26	10	36	28	10	38
Transport Equipment	19	11	30	20	9	29
	290	117	407	290	117	407
Source: Compiled from CMIE Prowess Database						

Table 3 shows the sample as per different categories of deal characteristics:

Table 3: Sample as per different categories of Deal Characteristics

Categories	Merger	%	Acquisition	%	Total	%
Related Deals	224	73%	81	27%	305	75%
Unrelated Deals	66	65%	36	35%	102	25%
With M&A Experience	159	67%	80	33%	239	59%
Without M&A Experience	131	78%	37	22%	168	41%
Large Target	31	67%	15	33%	46	11%
Small Target	259	72%	102	28%	361	89%
Source: Compiled from CMIE Prowess Database *Note: Explanation for these terms are given in subsequent sections*						

Each acquirer and target company belonged to a specific industry. Thus, each company was affected by rules and regulations of the industry to which it belonged. Economic factors also affected a specific industry. Different past studies used suitable control samples that were completely different from the experimental samples used to examine the post M&A performance to ascertain whether the firm performance was because of M&A and to isolate the influence of industry and economic factors. Adjusting for the effects of the external environment made the M&A performance analysis meaningful (Bild, et al., 2002); (Ramaswamy & Waegelein, 2003); (Ramakrishnan, 2008). In these studies, the pre M&A and post M&A performance were measured against those of control firms and industry adjusted performance. Control firms were selected for each industry based on two criteria (a) manufacturing companies that had

not gone for any M&A deals during the sample period (b) financial data were available for the sample period.

Table 4 shows the number of companies in each control group for EVA measure.

Table 4: Sample of Control Firms for Industry Average EVA Performance

Industry	Economic Value Added								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Chemical	236	256	286	295	307	325	410	411	192
Diversified	8	8	9	9	9	9	10	9	7
Food and Beverage	148	163	199	218	231	263	316	319	134
Machinery	138	143	163	176	163	171	176	209	101
Metal and Metal Products	99	107	164	159	176	179	198	231	90
Miscellaneous Manufacturing	58	64	78	88	97	101	106	136	56
Non Metallic and Mineral Products	50	55	59	64	68	66	71	79	41
Textiles	162	159	170	189	196	199	225	258	132
Transport	42	52	63	73	78	86	102	105	48
Source: Compiled from CMIE Prowess Database									

Table 5 shows the number of companies in each control group for traditional ratios.

Table 5: Sample of Control Firms for Industry Average performance for Traditional Ratios

Industry	Traditional Parameters								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Chemical	180	202	215	222	219	232	289	277	43
Diversified	6	6	7	7	7	7	9	8	3
Food and Beverage	114	126	151	167	171	181	203	189	25
Machinery	107	109	118	122	132	133	167	156	29
Metal and Metal Products	94	106	126	136	141	145	177	173	24
Miscellaneous Manufacturing	55	65	72	75	75	80	91	85	8
Non Metallic Mineral Products	41	43	48	47	48	47	51	43	7
Textiles	161	155	161	162	154	173	195	182	32
Transport	36	39	51	60	62	71	83	78	4
Source: Compiled from CMIE Prowess Database									

Based on the availability of financial data for the sample period, data were collected in relation to the M&A year.

Financial Measures of Performance

All the financial ratios were computed with the help of data collected from CMIE Prowess.

Traditional Financial Ratios

The different traditional financial parameters used for the study and the definitions of variables are listed in Table 6.

Table 6: Definition of Variables

Financial Parameters	Variables	Definitions
Liquidity	Current Ratio (CR)	Current Assets/ Current Liabilities
	Quick Ratio (QR)	Quick Assets/ Current Liabilities
Profitability	Return on Capital employed (ROCE)	Profit Before Interest and Tax/Average Capital Employed
	Return on Net Worth (RONW)	Profit after Tax/ Average Net Worth
	Return on Assets (ROA)	Profit after Tax/ Total Assets
	Net Profit Margin (NPM)	Profit after Tax /Sales
Leverage	Interest Coverage Ratio (ICR)	Interest/Profit Before Interest and Tax
Efficiency	Asset Turnover Ratio (ATR)	Sales/ Average Total Assets

Source: Collected from various existing literature - (Ooghe & Balcaen, 2000); (Mantravadi& Reddy, 2007); (Kumar & Rajib, 2007); (Vanitha & Selvam, 2007); (Kumar & Bansal, 2008); (Kumar, 2009); (Saboo & Gopi, 2009).

The ratios were not collected directly from the data source. Rather data for acquiring firms and target firms were collected separately and then each value was combined for pre and post M&A period separately and then the ratios were calculated (Healy, et al., 1992); (Ramakrishnan, 2008). After that, financial ratios were normalised because the sample of 407 firms consisted of acquiring and target firms from different industries in the manufacturing sector, and the data collected spanned over a long period of time i.e. 1992-2011. The time period might be affected by different economic conditions. The sizes of companies also differed significantly. All the financial performance parameters were adjusted for the control groups.

The rationale for choosing the following independent variables were as follows:

1. **M&A experience:** This variable is important because M&A experience affects acquisition decision making. Experienced acquirers are more likely to create value for shareholders whereas inexperienced acquirers are likely to destroy value (Whittall & Andersson, 2017).

2. **Size of acquirer:** It is one of the charecteristics of the merging firm that affects the firm value. Mittal, et al. (2017).

3. **Interest coverage ratio:** This ratio is significant because it reflects the ability of an organization to meet its financial obligations and liabilities. In general, a higher coverage ratio denotes a greater ability of the organization to meet its creditors' obligations while a lower coverage ratio means less ability. The coverage ratio is higher before the mergers than after the merger situation (Pina, et al., 2017).

4. **Asset turnover ratio:** The total asset turnover ratio measures the ability of a company to use its assets to efficiently generate sales. A company with a high total asset turnover ratio is considered efficient in making money using its assets. The ratio considers all assets, current and fixed. It is one of the important factors that have impact on the operational efficiency of production firms (Gill et al.,2017).

5. **Current ratio:** The current ratio is a popular financial ratio used to test a company's liquidity (also referred to as its current or working capital position) by deriving the proportion of current assets available to cover current liabilities (Nayak, n.d.). Among the conglomerates and non-conglomerate, the post M&A results are significant differences in current ratio which indicates it is an important parameter to evaluate perforamance (Anwar & Debby, 2017).

6. **Quick ratio:** The quick ratio is an indicator of a company's short-term liquidity. The quick ratio measures a company's ability to meet its short-term obligations with its most liquid assets. Among the conglomerates and non-conglomerates, the post M&A results show significant differences in quick ratio, indicating it is an important parameter to evaluate perforamance (Anwar & Debby, 2017).

7. **Return on assets:** Return on assets (ROA) 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. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. ROA is an important factor to evaluate the financial performance of firms (Gandhi et al., 2017).

8. **Return on capital employed:** Return on capital employed (ROCE) is a financial ratio that measures a company's profitability and the efficiency with which its capital

is employed. The return on capital employed measure to firms' post-acquisition performance where acquirers with higher pre-acquisition net returns on capital employed have superior long-run operating and stock performance than do acquirers with lower returns (Qian & Zhu, 2017).

9. **Net profit margin:** Net profit margin is the percentage of revenue left after all expenses have been deducted from sales. The measurement reveals the amount of profit that a business can extract from its total sales. (Bos et al., 2017).

Economic Value Added

Pandey (2005) viewed the concept of economic profitability as equivalent to the concept of economic value added (EVA). From the equity holders' point of view, EVA was expressed as net profit over and above the charge of equity capital (Net Worth). The charge for equity capital, otherwise known as cost of equity, was measured with the help of capital asset pricing model (CAPM).

Following Pandey (2005), an alternative formula that was taken for the study is given below:

Economic Value Added (EVA)= Net Profit – Cost of Equity *Average Net Worth.
K_e was estimated using Capital Asset Pricing Model:
$K_e = R_f + \beta_i (R_m - R_f)$
Where
K_e = Cost of Equity (calculated below)
R_f = Risk Free Rate of Return
R_m = Rate of Return on Market Index
β_i = Beta coefficient

The R_f was taken as 7% while R_m was taken as 15%. For the purpose of calculating risk free rate of return, the average yield on the 10 year government bond from 2001-02 till 2010-11 was considered using the average of central government securities (Per cent per annum) for the sample period of study. Data was collected from Reserve Bank of India records. For calculating the market rate of return, the compounded annual growth rate (CAGR) in BSE Sensex was taken from in 1990-91 to in 2010-11. The CAGR was calculated using the annual averages of share price indices and market capitalization data collected from Reserve Bank of India website.

Beta Values were collected from the CMIE Prowess database. The beta of scrips was computed by CMIE and stored in the database. It was the slope of the regression line derived by regressing the weekly returns of scrip against the weekly returns on the 'CMIE Overall Share Price Index. The regression was done yearly in April and it used the latest five years of weekly returns for the scrip and for the COSPI.

The EVA results were based on standardized data which were industry adjusted. In this study, the rate of EVA (EVA/Average Net worth) was taken so that it would adjust for the size of the companies. Industry medians were taken for the EVA and rate of EVA measures. The industry-adjusted measures were calculated by deducting the industry financial ratio medians from individual sample firm financial ratios.

Basic Specifications for the Study

For the purpose of this study, certain assumptions and specifications were made:

- Log of total assets was taken as the proxy for the size of the companies.
- The median of the total assets of the acquirer company in the acquisition year was taken into consideration for segregating the acquirer into large and small companies.
- Size of acquirer for linear and logistic regression was the log of total assets prior to one year of M&A.
- Experience was a dummy variable with value 1 representing the prior M&A experience of acquirer and 0 otherwise.

Tools and Techniques

Three year average pre and post M&A financial ratios were compared to observe any significant change in the long term financial performance due to M&A, following Vanitha & Selvam (2007); Mantravadi & Reddy (2008); Kumar (2009); Saboo & Gopi (2009) and Usman, et al. (2012).

Logistic Regression

Logistic regression was used to find out the probability of the manufacturing companies in India being successful or unsuccessful after mergers and acquisitions carried out by using logistic regression as per the occurrence or non-occurrence of the event (success and failure of M&A) of firms. To define the firms being successful or unsuccessful/ failure after M&A, (EVA or "Economic profit" was used to segregate the sample firms into successful and unsuccessful M&A deals.

The current study was carried out by using logistic regression as per the occurrence or non-occurrence of the event (success and failure of M&A) of firms. In the study, logistic regression was used to analyses the impact of different facts that influenced companies becoming successful or companies becoming unsuccessful after mergers and acquisitions. Here the dependent variable is (Y_i) was binary in nature taking the value 1, if the company was successful and 0, if the company was not successful. P_i was the probability that a company was successful after merger and/or acquisition and (1- P_i) defined the probability that a company was unsuccessful after merger. The Logit Model was:

DV = Binary (Pi) & (1-P_i)

IV = M&A Experience, Size of acquirer, CR_{pre123}, QR_{pre123}, ROA_{pre123}, $ROCE_{pre123}$, $RONW_{pre123}$, NPM_{pre123}, ATR_{pre123}, ICR_{pre123}

Where,

L_i = Logit

The dependent variables were:

P_i = Probability that companies became successful after merger and acquisition, success being:

(a)

Or

1-P_i = Probability that companies became unsuccessful after merger and acquisition, failure being:

To classify the firms being successful or unsuccessful/ failure after M&A, rate of EVA was used.

The independent variables were:

X_1 = M&A Experience;

X_2 = Size of Acquirer

X_3 = Pre M&A return on net worth;

X_4 = Pre M&A interest coverage ratio;

X_5 = Pre M&A asset turnover ratio;

X_6 = Pre M&A current ratio;

X_7 = Pre M&A quick ratio;

X_8 = Pre M&A return on assets;

X_9 = Pre M&A return on capital employed;

X_{10} = Pre M&A net profit margin;

υ_i = Random Disturbance Term

Model Specification and Variables

The rate of EVA, regarded as a true measure of profit as well as an index score (based on taking the weight of different financial performances were used as criteria for deciding success or failure. The independent variable took financial ratios prior to M&A and other factors like size and experience prior to the deal.

The descriptive statistics table categorised the sample into two parts to distinguish between successful and failure companies in mergers and acquisitions. The likelihood ratio test results were also shown in each table for each model since it was an indicator that was like the R^2 statistic of multiple regression and indicates the explanatory ability of the logistic model. The difference of logit was formulated into an odds ratio. The odds ratio was the ratio of the odds of an event occurring in one group to the odds of it occurring in another group. It meant the odds ratio showed the probability of success to the probability of failure. The odds ratio for each model was also shown for each specific model. Therefore, the higher the odds ratio, the more positive were the impacts of the independent variable on the probability of merger and acquisition success.

The cut-off point for logistic regression in this study was 0.50. Companies were assigned to groups with respect to their scores i.e. after the logistic regression was run, at the cut off score, the result found a z score that would determine the level from which a company would be regarded as successful or a failure after merger and acquisition. The companies that scored below the cut-off will be considered as possible failure companies and vice versa. See Table 7 below.

Table 7: Descriptive Statistics of Independent Variables using rate of EVA

Descriptive Statistics	Successful Companies		Failure Companies	
	Mean	Std. Deviation	Mean	Std. Deviation
1. M&A Experience	0.57	0.50	0.61	0.49
2. Size of acquirer	5.91	1.95	5.95	1.84
3. CR_{pre123}	-0.07	0.35	-0.01	0.33
4. QR_{pre123}	-0.03	0.34	-0.08	0.31
5. ROA_{pre123}	0.05	0.27	0.04	0.28
6. $ROCE_{pre123}$	0.03	0.33	0.01	0.30
7. $RONW_{pre123}$	0.03	0.26	0.04	0.26
8. NPM_{pre123}	0.03	0.26	0.03	0.25
9. ATR_{pre123}	0.03	0.36	-0.05	0.40
10. ICR_{pre123}	0.02	0.28	0.01	0.25

The numbers of failure M&A cases are more than those considred successful, consistent with the earlier studies.

Discussion of Logistic Regression Results using Rate of EVA

This section investigated the results for finding determinants associated with the likelihood of a manufacturing firm becoming successful or unsuccessful in a merger or an acquisition. Table 8 showed the results of the logistic regression performed to determine which characteristics in acquiring firms make a firm more likely to be successful after mergers and acquisitions using Rate of EVA.

Table 8: Logit Estimates using rate of EVA as Dependent Variable

Independent Variables	Merger and Acquisition		Acquisition		Merger	
	Coefficient **(β)**	**Odd RatioExp (β)**	***Coefficient*** **(β)**	**Odd RatioExp (β)**	**Coefficient (β)**	**Odd Ratio Exp(β)**
Constant	-0.06 (-0.16)	0.94	-1.01 (-1.33)	0.36	0.19 (0.44)	1.21
1. M&A Experience	-0.27 (-1.16)	0.76	0.16 (0.30)	1.17	-0.40 (-1.50)	0.67
2. Size of Acquirer	0.05 (0.73)	1.05	0.13 (0.95)	1.14	0.03 (0.36)	1.03
3. CR_{pre123}	-2.73 (-4.87^{***})	0.07	-3.96 (-3.13^{***})	0.02	-2.31 (-3.44^{***})	0.10
4. QR_{pre123}	2.94 (4.79^{***})	18.92	5.18 (3.53^{***})	177.68	2.24 (3.16^{***})	9.39
5. ROA_{pre123}	0.78 (0.95)	2.18	2.72 (1.45)	15.18	0.28 (0.29)	1.32
6. $ROCE_{pre123}$	-0.01 (-0.01)	0.99	-2.32 (-1.69^{*})	0.10	0.51 (0.84)	1.67
7. $RONW_{pre123}$	-0.29 (-0.43)	0.75	-1.18 (-0.71)	0.31	-0.26 (-0.34)	0.77
8. NPM_{pre123}	-1.44 (-1.84^{*})	0.24	0.14 (0.08)	1.15	-1.45 (-1.56)	0.23
9. ATR_{pre123}	0.74 (2.33^{**})	2.10	1.32 (1.73^{*})	3.74	0.68 (1.80^{*})	1.97
10. ICR_{pre123}	0.17 (0.27)	1.19	-0.61 (-0.39)	0.54	0.13 (0.19)	1.14
Number of Observations	407		117		290	
f(beta'x) at mean of independent variables	0.250		0.245		0.250	
Likelihood ratio test: Chi-square(10)	36.0484 [0.0001]		27.18 [0.0024]		20.5291 [0.0246]	
Number of cases correctly predicted	254 (62.4%)		81 (69.2%)		175 (60.3%)	
Mean dependent variable	0.49		0.44		0.51	
McFadden R-squared	0.06		0.16		0.05	

S.D. Dependent variable	0.25	0.24	0.25
Adjusted R-squared	0.02	0.03	-0.003
Log-likelihood	- 63.94	-66.54;	190.72;
Akaike criterion	549.88;	155.08;	403.44
Schwarz criterion	593.97	185.46	443.80
Hannan-Quinn	567.33	167.41	419.61
Z score	Less than 0.02-Failure 0.02 and Above-Success	Less than 0.02-Failure; 0.02 and Above-Success	Less than 0.01-Failure while 0.01 and Above-Success
*Note: ***, **and, * represent statistical significance at the 1 %, 5 % and 10 % levels respectively. The figure in the bracket represents the z statistics values.*			

Using EVA, the results of logistic regression were found for M&A (as shown in Table 8). The estimated coefficient on current ratio (liquidity), net profit margin (profitability) were negative and statistically significant (Ravenscraft & Scherer, 1987); (Singh, 1975); (Newbould, 1970); cited from (Daga, 2007). The estimated coefficients of quick ratio (liquidity), asset turnover ratio (efficiency) were positive and statistically significant (Pawaskar, 2001); (Kumar & Rajib, 2007). Thus, it coud be concluded that the lower pre M&A current ratio and profitability, increased the probability of a given firm being successful after M&A; whereas the probability of M&A being successful increased with increase in the pre M&A quick ratio and efficiency. Prior M&A Experience, pre M&A return on capital employed, return on net worth, interest coverage ratio and acquirer size did not impact on the probability of the firm being successful after M&A. At the cut off value of 0.50, the model correctly predicted 150 failure cases with 104 success cases. There were 153 cases where the successful companies were classified as unsuccessful and vice versa. There were a number of misclassifications.

The results of logistic regression using the EVA found for acquisition is shown in table 8. Excluding the constant, p-value was highest for variable NPM_{pre123}. The estimated coefficients of current ratios (liquidity), return on capital employed and return on net worth (profitability) were negative and statistically significant; whereas the estimated coefficients of quick ratio (liquidity), asset turnover ratio (efficiency) were positive and statistically significant. Thus, it could be concluded that in the case of acquisition, the lower the pre-acquisition current ratio and return on capital employed and return on net worth, the higher the probability of a given firm being successful after acquisition. Whereas the probability of M&A being successful increased with increase in the pre M&A quick ratio and asset turnover ratio (efficiency). Prior M&A Experience, Pre-M&A return on assets, return on net worth, net profit margin, interest

coverage ratio and acquirer size did not impact on the probability of the firm being successful after acquisition. Net profit margin was not found to be significant in classifying the companies into successful or unsuccessful after M&A. At the cut off value of 0.50, the model correctly predicted 51 failure cases and 30 success cases. There were 36 cases where the successful companies were classified as unsuccessful and vice versa.

The results of logistic regression using the EVA found for mergers are shown in Table 8. Excluding the constant, p-value was highest for variable ICR_{pre123}. The estimated coefficient on current ratio (liquidity) was found to be negative and statistically significant. The estimated coefficients of quick ratio (liquidity), asset turnover ratio (efficiency) were positive and statistically significant. Thus, it could be concluded that in case of mergers, the lower the pre- merger current ratio, the greater the probability of a given firm being successful after merger; whereas the probability of M&A being successful increased with increase in the pre-M&A quick ratio and asset turnover ratio (efficiency). M&A experience, size of the acquirer, the company's profitability and solvency variables like return on assets, return on capital employed, return on net worth, net profit margin, interest coverage ratio has emerged as insignificant variables in explaining merger activity in the Indian economy as far as the manufacturing sector was concerned. The implication for quick ratio (liquidity) might be, the likelihood of a company to be successful increased with increases in the liquidity of firm in pre-merger period because liquidity showed the ability of a company to meet its short-term debt obligations and good financial health. At the cut-off value of 0.50, the model correctly predicted 85 failure cases and the 90 success cases. The numbers of cases where the successful companies are classified as unsuccessful were 115. There were a number of misclassifications.

From the entire logistic regression models, it was found that the size of acquirer and prior M&A experience did not predict the success or otherwise of a merger or acquisition. It showed that the post M&A rate of EVA success or failure did not support the size and experience hypothesis.

Similarly a large acquirer might be successful because of its market power that would help to reduce the cost of capital for its heavy raw material purchase; or a small acquirer would be successful because they went for small but strategically fit targets.

Likelihood ratio test showed the explanatory power of the model. Here the likelihood ratio test was at 0.0001 for M&A, at 0.0024 for acquisition and at 0.0246 for merger. It indicated the logistic model provided a better explanation of a firm's success for merger probability. Note the lower likelihood ratio for acquisition index. The index is even lower with the both merger and acquisition sample

Few conclusions could be drawn from the logistic regression and its predictive accuracy. The financial ratios were very useful in identifying the characteristics for successful and unsuccessful firms after post-merger and acquisition performance. From the prediction model, classification accuracy for all the models was above 60% consistent with past findings from literature (Sorensen, 2000). Quick ratio, an indicator of liquidity was the only significant financial ratio in all the models discussed above, that identified the characteristics of manufacturing firm to be successful or unsuccessful after M&A. `

Concluding Remarks

The study used logistic regression analysis to predict the impact of different factors influencing companies becoming successful or unsuccessful after mergers and acquisitions. Increase in the rate of EVA in the post M&A period compared to the pre M&A period was considered as successful or unsuccessful. The logistic regression results using the rate of EVA parameter found that the number of 'correctly predicted' cases was 254 (62.4 percent) for both M&A, and 81 (69.2 percent) for acquisition, 175 (60.3 percent) for mergers. The probability of a given firm being successful after M&A increased as the pre M&A current ratio, net profit margin decreased; while its pre M&A quick ratio and asset turnover ratio increased. It was also estimated that a Z score of below 0.02 in the case of M&A would indicate the company was probably headed for failure, while companies with scores above 0.02 were likely to be successful. A Z score of below 0.01 in case of a merger would indicate the company was probably headed for failure, while companies with scores above 0.01 were likely to be successful. Out of the various factors considered, quick ratio was the most significant predictor of M&A success. Thus, managers should give more importance to a company's liquidity position.

Implications for Theory and Practice

M&A deals had recentely increased manifold in recent days in manufacturing companies in India. This study contributed to the theory and practice of M&A literature in several ways.

1. It showed the potential prediction power of various factors that affected M&A success, thereby allowing the managers to understand and differentiate between the significant and insignificant factors affecting M&A success.

2. It provided important managerial implications as to which factor managers should take into consideration before making an M&A deal so that they could improve their corporate strategy and planning. and help the company to improve by appraising its approaches on the key areas.

In earlier studies, logistic regression had been used to predict characteristics of acquirer and target companies for possible M&A deals. This study used logistic regression to find out the characteristics of manufacturing firms to know if they would be successful or not after adopting M&A as a growth strategy. This study also considered EVA as a useful company performance metric to predict the success of M&A deals. These findings might bring new insights on the role of various determinants of M&A success.

Limitations and Scope for Future Research

This study had focused on companies only in the manufacturing sector due to limitation of time and resources. Further, the use of a limited number of few independent variables in th logistic model might not be fully adequate to predict the M&A success. Future studies can be made taking into account more factors.

Acknowledgement: This paper is mainly based on part of Dr. N.M. Leepsa's doctoral research work done in IIT Kharagpur. and which was presented in an international conference on financial markets and corporate finance(ICFMCF-2016) at the Department of Management Studies, Indian Institute of Technology Madras, Chennai during 12th -13th August 2016.

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“You see things; and you say, “Why?” But I dream things that never were; and I say, Why not?”

– George Bernard Shaw

Enhancing Competitiveness through Customer-oriented Branding: The Case of Boeing 787 Dreamliner

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Abstract

The purpose of this paper is to examine whether strong brands enhance competitiveness and provide some key insights for practitioners. The case of Boeing 787 Dreamliner is mentioned with the exclusive features of its branding strategies. This paper finds that customer-oriented branding has become a vital component in any marketing strategy in the twenty first century, an era of aggressive market competition. A strategy based on a well-established brand and the expressed needs of the target market is highly likely to be sustainable because it enables firms to be competitively sound. By taking into account its customer service touchpoints to have a comprehensive understanding of the entire service system, Boeing has created a customer-centered design essential for a successful brand. This paper suggests that brands provide service differentiation universally. A firm's internal attributes and capacity play a significant role in its brand image, personality and the development of brand equity. Brands are multifaceted in nature and positive service encounters can form the basis for building strong brands.

Keywords: Brand, Boeing 787 Dreamliner, Competitiveness, Customer-oriented, Service

Introduction

The twenty-first century may well indeed be the century of the brand. According to Court, French and Knudsen (2006), a brand war is being experienced in today's proliferating marketing space. Research has found that brands add value, provide competitive advantage and enhance customer retention and profits (Rooney, 1995; de Chernatony and McDonald, 1992). Just having a product or service may not always be sufficient. To enhance competitiveness that delivers service quality, value and satisfaction, firms need to have a strong brand that effectively incorporates the actual needs and experiences of the customer. Increasing our understanding on branding is essential, given its impact on customers and profits, which in turn augments sustainable value and competitiveness for both the company and its products and services. Precise knowledge of branding helps create a positive image in the minds of consumers, which is essential to enhance value and growth (Mowle and Merrilees, 2005; Romeo, 1995).

Solid brands encounter lucrative customers and managing brands is an art that must be mastered by the successful marketer. However, this can be increasingly difficult and complicated with the emergence of strong global brands, high market competition and increasing competition for consumer dollars as managing brands in the twenty-first century is considered a challenging task (Herstein and Zvilling, 2011). In reality, a brand's position will not take effect fully unless everyone in the company lives the brand. A brand adds dimensions by differentiating a firm's offering from other competitors who compete to satisfy the same need. Marketers must be able to create, maintain, enhance and protect brands. Strategic brand management must cover the design and implementation of marketing activities and programs to build, measure and manage brands to maximise their value.

In light of the above, the purpose of this paper is to examine whether strong brands enhance competitiveness and provide some key insights for practitioners. The case of Boeing 787 Dreamliner is discussed with the exclusive features of its branding strategies. Both academic and practitioner publication sources have been used. This paper is structured as follows: Part 1 consists of the introduction. Part 2 is a conceptual overview that focuses primarily on branding and its association with services. Part 3 discusses the significance of having good brands and their key attributes followed by a deliberation on the advantages of good branding in the fourth segment. The fifth part consists of a case study relating to the 787. The final section

of this paper consists of managerial implications, conclusions, the limitations of this study and future research directions.

Brand and Service - A Conceptual Overview

Schlager *et al.* (2011) suggest that a 'brand' consists of feelings, impressions, perceptions, beliefs and attitudes towards a company. A brand may also be described as a value or benefit, which is not tangible and whose exact value cannot be resolute without it first becoming involved in a commercial undertaking involving sale, purchase and acquisition (Seetharaman, Nadzir and Gunalan, 2001). Branding enriches the value of companies by differentiating their service offerings that generate growth (Mowle and Merrilees, 2005; Romeo, 1995).

By the 1940's, research and publications on the subject of branding were apparent in the marketing literature and notably over seven hundred write-ups were seen in the twentieth century (Pike, 2009). Conversely, it has also been acknowledged that the idea allied with branding began much earlier. For example, between 1643 and 1715, France under the rule of Louis XIV, had been through the stages of branding and re-branding (van Ham, 2008).

The idea of brands associated with services has been well established and recognised over the last few decades, highlighting the importance of value creation and development of service brands as a significant source of sustainable competitive advantage (Gilmore, 2003; de Chernatony and Segal-Horn, 2003; McDonald, de Chernatony and Harris, 2001; Kasper, van Helsdingen and de Vries, 1999). Apart from the fact that branding and its association to services has received substantial attention for some time, it has also undoubtedly established itself as a separate and distinct idea or concept in its own right primarily due to the integral features of services (Gilmore, 2003; de Chernatony and Segal-Horn, 2003; Palmer, 1998; Dibb and Simkin, 1993; Taylor, 1987).

It is therefore evident from the above perspectives that a brand is important and of particular value to a company as it can significantly help customers recognise equity and make essential distinctions amongst other competitors (Omar, Williams and Lingelbach, 2009; O'Cass and Lim, 2002). Correspondingly, numerous studies have

also highlighted the importance and worthiness of strong brands as a valued asset, which serves as an enhancer to the goods and services firms sell to customers (Radder and Huang, 2008; Kotler *et al.,* 2008; Armstrong and Kotler, 2009).

According to Changsorn (2002) it is important that companies bring their branding experiences to their valued customers to make it an essential part of the service offering in order to explicitly communicate its positive qualities and attributes. Brands are essential to add value and appeal to the service offerings, providing sense, delivering competencies, quality and outlook for the company and its customers (Lim and O'Cass, 2001; McCracken, 1993).

There are also exclusions to the above, particularly in developing countries where a large segment of the population are low to middle income earners and brands may not be a significant component in commercial activities (Gbadamosi, 2009). However, it could be rationally argued that brands offer a foundation to customer agreements and a strong customer-oriented brand will no doubt allow for superior marketing activities and permit customer loyalty and service attractiveness (Schlager *et al.,* 2011).

The above arguments and relationships potentially offer a background for a discussion on the issue of competitiveness and customer-oriented branding, which constitutes the focus of this paper.

Importance of a Competitive Brand

Company image and positioning are outcomes of customer perceptions and together with these is the concept of brand derived from customer tastes, preferences and attitudes towards specific products and service offerings and the value associated with them. The term 'brand' is a diverse concept, which does not only portray high awareness, name and logo, although these are important attributes. A brand is an influential stimulus that invokes a multifarious image, level of expectation about itself and what it can provide for its customers. Brands today play a focal role in business strategies of leading organisations and serve as a service enhancer and valuable asset to marketers (Kotler *et al.,* 2008; Armstrong and Kotler, 2009).

A strategy based on a strong brand is highly likely to be sustainable because it

enables firms to be competitively sound and creates a barrier difficult for others to duplicate. Temporal and Lee (2000) mention that everything physical can be copied with amazing speed, which only leaves brands that is built on originality. A brand generally follows the cycle of introduction, recognition, acceptance and commitment and is a function of both marketing and customer inputs.

A complex relationship emerges when considering the development of brands and ensuring its loyalty. Brand equity gradually builds up over time and only has a desirable impact when all conditions are complementary and all components are perceived by the customer as mutually supportive within an overall entity. Brand names that have been generic and identical do not seem to provide anything other than a name without any accompanying personality. For a lasting customer-oriented brand, a brand name is not sufficient to add excitement and value to the service. A brand must offer real benefits and be adequately reliable to meet customer needs. It must also provide value to the service offering through the co-creation of efforts and resources. Solid brands win customers trust by offering them ideal solutions (Hamann, Williams and Omar, 2007). Building awareness and image over time is crucial to achieve loyalty that could also ensure your brand as the preferred choice for customers. A customer choosing between two options that may otherwise seem about equal in terms of product and service specifications might prefer the one that is associated with the stronger brand (Roberts and Merrilees, 2007). Marketing strategies must ensure that they help develop the acceptance and loyalty of a brand. A strong branding strategy will also signal that firms are serious about marketing and that they intend to be around for a while articulating their values, service offerings and competitiveness. A brand impresses the firm's identity upon potential customers, not necessarily to capture an immediate sale but rather to build a lasting impression of the firm and its offerings. This can also enable the brand to be well positioned to offer greater benefits that create positive customer perceptions. Emotional distance between the customer and the service offering would also have an impact as well as the intensity of feelings that determine the power of the brand as an important stimulus in the buying decision.

Key features of a customer-oriented brand include:

- The brand must excel at delivering the benefits customers truly desire;
- The brand must stay relevant to the actual quality of the offer;
- The pricing strategy should be based on customers perceptions of value, which include quality, design and features;

- The brand ought to be properly positioned and reliable to occupy niches in customers minds;
- The brand is consistent, that is, striking the right balance between continuity in marketing activities and the relevant changes required;
- The brand portfolio and hierarchy should not be confusing with the company having different brands for different markets;
- The brand's marketing elements can be trademarked to enhance awareness and provide competitive and legal protection;
- Managers must understand what the brand means to customers in terms of customer beliefs, attitudes and behaviours for confident and effective decision making and management;
- Brand equity must be carefully constructed and given continued support; and
- Regular brand audits and ongoing brand-tracking studies must be carried out to assess the wellbeing and relevance of the brand.

Advantages of Good Branding

Customer retention and product identification

According to Roberts and Merrilees (2007), customer retention is the most profitable way to grow a business and brands are a key component in determining contract renewal. Brands are at the heart of every marketing strategy and we now live in a world where everything from opera companies to football clubs, charities, pressure groups and political parties think of themselves as a brand with specific values and identities. A high quality brand attracts and retains customers through the psychological criteria, enabling them to identify the products and services that promise specific benefits driven by expectations about quality, price and performance. In essence, customer satisfaction is the outcome of service quality. Branding helps buyers in many ways. Good brand names help consumers identify products and services that might benefit them and inform the buyer something about product quality. Recognised brand names differentiate service offerings to provide an advantage over competitors (Davis, Golicic and Marquardt, 2008). The seller's brand name and trademark provide legal protection for unique product features that otherwise might be copied by competitors.

Building and managing brands is perhaps the marketer's most important task. Sound relationships between the brand and its customers form the basis for enduring success,

profitable customers and unremitting competitive advantage despite disruptions in the marketplace (Payne *et al.,* 2009). Therefore, the fundamental asset underlying brand equity is customer equity, which is the value of the customer relationships that the brand creates. Benefits derived from a brand may also relate to the functional advantages it provides, the symbolic information it conveys, or the experiential feelings it produces. Attitudes, which represent a high level of brand associations reflect consumers overall evaluations of a brand and consequently often determine their behaviours towards it.

Sales and revenue

In order to increase profitability and climb up the value chain, marketers have realised that one of the critical success factors for international reputation is their brand image (Ille and Chailan, 2011). A strong brand influences the buying decision and shapes the ownership experience. It can command a premium price and maximise the number of units that can be sold at that premium. It is believed that the ability of firms to copy tangible aspects, such as competitors' production methods, technology and services to gain sustained competitiveness will not have much scope. Conversely, a brand is intangible and will not be easy to duplicate and therefore firms can provide an offer that is separate from others in the same product class. Nonetheless, the tangible aspects of the service also have a significant impact on the service provider (Herstein and Gamliel, 2006). Well-established brands generally produce greater purchase revenue as it acts as an identifier and differentiator, however it does not necessarily guarantee loyal customers.

Creating a positive brand image requires establishing strong, favourable and unique associations for the brand. Research shows that customer interactions such as purchasing behaviour is closely associated with brand image and its meanings (Schembri, 2009; Berthon, Pitt and Campbell, 2009) This image could have been developed on many inputs over a period. This will certainly have a considerable impact on the customer, sales and revenue that will subjectively affect the evaluation of the offer even though it may not be an entirely true picture of the particular product. Negative brands have unwanted reputations, unappealing images and are a liability to the company.

Trust and purchase decisions

Brands provide a point of difference (competitive advantage) in the purchasing decisions of potential customers (Roberts and Merrilees, 2007). Customers' ability to

identify a particular brand makes the purchase decision faster and reduces uncertainty. High quality brands help make purchasing decisions easier. Hillenbrand *et al.* (2013), in their study concluded that brand names have a positive effect on the customer purchase decisions as they provide valuable cues about the underlying product or service. This suggests that branding delivers important benefits. In a commodity market where features and benefits are virtually indistinguishable, a strong brand will help customers trust the company and create a set of expectations about the products without even having a good understanding of the product specifications. An important mechanism through which brands can influence consumer choice is brand credibility, which is the believability of an entity's intentions that manifests as trustworthiness (Omar *et al.,* 2009). Trusted brands are also useful to customers when repeated straight purchases are made as this does not involve a detailed evaluation due to the reassurance of the offer and satisfactory past experience. Brands that are trusted are often purchased more frequently than their counterparts that do not evoke high degrees of trust (Knox 2004; Sichtmann, 2007). They can also create a positive image, which is a major competitive advantage. Branding creates trust and an emotional attachment to a firm and its offerings. This attachment can drive customers to make decisions based upon emotions, which may not necessarily be dependent upon logical or intellectual reasons.

Customer allegiance

There is a long-term effect on weak and strong brands, which can significantly influence purchase decisions. Roberts and Merrilees (2007) shows that firms increase brand loyalty by building stronger brand attitudes. Many customers aspire to own products that carry excellent brands though they may not be able to afford them. However, when they are in a better position, there is a strong favouritism towards the well-positioned brand against the less popular one. When a strong customer-brand relationship emerges, not only will the company enjoy repeat sales, but also profits per customer will increase with customer longevity. Therefore, the longer customers are with a company, the greater the willingness to pay premium prices, which also has an effect on their lifetime value. Strong brands offer attractive prices and customer loyalty (Herstein and Gamliel, 2006). Individuals that are familiar with a brand are more likely to purchase the brand. Reliable brands will help companies fence off customers from competition and protect their market share while building mind share. Once firms have mind share, customers will primarily think of them and their respective product categories. Kemp and Bui (2011) suggest that when customers believe that a brand

is credible, they repeatedly purchase the offerings that carry the brand and develop a commitment towards it.

Supplier benefits

Having a strong brand also has significant benefits to the supplier. Suppliers are one of the most important determinants of the strength of a brand (Davis *et al.,* 2008). If the brand is valued and cherished by the customer, it creates an opportunity that should be capitalised. This could be exploited in terms of higher prices, entering untapped markets, gaining market share and sales revenue and extending the attributes of the brand name across new offerings that would develop customer confidence and recognition. In the study by Heilmann, Saarenketo and Liikkanen (2013), it was established that customers by and large would be willing to pay higher prices and do business with suppliers who have a strong and positive brand. On the other hand, customers may also get muddled with the brand image and products and services that fall short of meeting expectations, which can generate negative perceptions towards the original offering (Osei and Gbadamosi, 2011).

A sustainable brand must have a high level of awareness in the target market and offer customers with relevant product attributes with added value so that it meets the psychological needs of customers. Andersson and Ekman (2009) in their study have mentioned the important connection between the stakeholders of a company and its association to brands. Multinational companies have a challenge to ensure that their global brands have an identical formula, packaging and positioning universally as customers will punish inconsistencies in any of these aspects. Although, local companies may not achieve economies of scale or a high recognition of global brands, they should capitalise on well-established brand images and awareness within a specific target market.

Boeing 787 Dreamliner

The Boeing 787 Dreamliner has been one of the most anticipated and scrutinised aeroplane in commercial aviation history. Through enormous psychological research, Boeing has worked on the various branding strategies of this aircraft to be amongst the best in the world. The 787 allows airline companies to customise the interior design with a human fascination to the aeroplane to suit their brand and make it unique. From

the onset, they have created a transitional space for the 787 customers. Passengers are provided an architectural welcome into the aircraft as they walk through the air bridge into the aeroplane. The idea is to release passengers from the narrow air bridge into the large and attractive entryway of the 787 in order to get passengers focused on the flying experience. This transition also creates a psychological effect between one touchpoint to the other. The 787 entry way is an important service differentiator in terms of the branding perspective and personality from other competitors.

Inside the aeroplane is the light-emitting diode (LED), a full colour spectrum lighting mainly to reconnect the passenger with the flying experience. The aeroplane has the ability to make the lighting represent sunrise or sunset on both the ceiling and sidewalls. This perspective of service delivers an environment to customers that reflect the time of day during the flight. The aeroplane has sky blue lighting overhead and large windows without the window shades that provide passengers with the captivating experience of a sky overhead. The blue lighting makes the plane ceiling feel high and has a calming effect on the passenger. The speed of the mood lights can also be controlled by the cabin crew, as well as it's colours to cycle through different shades of sunrise to sunset, or they can also bring in some of their own brands into the cabin.

Another unique feature of its branding is the absence of plastic window shades. The 787 has incorporated an electric chromic film technology to enable passengers control the amount of light coming through its wide windows with the press of a button. It is like applying a tint to the window so the outside could clearly be seen with the window literally closed, causing no inconvenience to other passengers.

Boeing has also allowed airlines to customise their interior to suit their brand of seating configuration. It offers a range of configurations to enable airline companies layout their seating arrangements according to their choice of airfares, set up or differentiate themselves in terms of colours, fabrics and features on the seats to reflect their specific branding characteristics. Therefore, airline companies are able to get their brand perception and personality expressed through these features, which ultimately creates differentiation and drives customer loyalty. Another remarkable feature is the new premium economy class that the 787 is offering. Due to higher fares associated with the business class and the fare difference relative to the economy class, it has created a product in between to enable more passengers to enjoy top-class flying. Other features include larger stow bins and more ergonomically designed latches, slide

downs and lavatory doors. There is also improved efficiency in terms of fuel and its use of carbon fiber composite materials.

Trusted brands make customers feel positive, engaged and committed as their needs are aligned with the firms' purpose, which ultimately creates demand and better relationships. With numerous options and flexibility to airline companies in the way they prefer to deliver their brand, the 787 offers its customers the choice of having a modern and comfortable interior design. This makes up the critical components of its branding strategy necessary to achieve maximum value and sustainable competitive advantage for its service offering.

Managerial Implications

This paper provides a number of interesting insights for practitioners. First, brands have been one of the most imperious commercial subjects over the years. Essentially, brands have the potential to differentiate services in the global arena. Renowned and strong brands like Boeing have the ability to differentiate themselves to gain strategic competitive advantage over other service providers. This also suggests that customers would be willing to engage more and offer better prices to firms who have strong and positive brand images. For companies to differentiate their service offerings from competitors, it is important that they are competent in devising and communicating their idiosyncratic features and attributes, predominantly those that underpin their core services offerings. This also suggests that key competences and attributes should also be connected to their respective brands.

Second, the performance of the service offerings is also crucial, as customers must get the message that service providers are responsive to their needs and importantly integrate them as valuable trade associates. Service providers should recognise customers as essential inputs to a successful brand and value creation process. Hence, customers should never be viewed as outputs or end products. This will also increase market share as more customers will come in contact with the brand, providing meaningful advantages in the market by differentiating the services in terms of better quality and value.

Third, this paper stresses that a firm's name and service brand has to be closely

unified to clearly differentiate the offerings. When this happens, the internal attributes of the firm, such as its expertise, human resources and capabilities add as vital inputs to the brand image and awareness. This also suggests that customer interactions have a significant impact on the brand image and therefore it has to be diligently considered. All these factors are significant components of the development of brand equity for service providers. It is also vital that brand names are easily identified by customers, which will also help identify and distinguish the service offering.

Fourth, a further implication relates to the allocation of resources, which are predominantly important for managers. To enable a positive and reliable brand name or image, it is prudent that companies expand their efforts in areas of employee training. Personnel are one of the most important components in service delivery and therefore it is important that management expands programmes in areas of service training and not only allocate large sums of money and resources towards promotional activities to build brand image and awareness. High quality and consistent service delivery is vital to meet or exceed customer expectations. A solid customer-oriented brand would be one that recognises the needs of customers and considers them as a key component in value creation. This also implies that managers will need to comprehend how their capabilities and management propel their company's accomplishments and success for customers, which would be an important part in connecting the qualities of their brand name and image.

Finally, brands are multifaceted in nature and therefore it is vital that all components are managed proficiently. Service providers must have a clear understanding of the critical service encounters that affect their overall business, product and service quality. This advocates that positive encounters should form the basis of building a solid brand. Service quality is associated with the emotional state of the customers mind and comprises of the overall evaluation of service. Hence, it is important to view service quality as the overall evaluation of all aspects and processes of the service in the service environment.

Conclusions, Limitations and Future Research Directions

This paper examined the importance of having strong brands to enhance service competitiveness. The case of the Boeing 787 Dreamliner was mentioned with the exclusive features of its branding strategies. In today's competitive and crowded marketplace, it is essential for companies to have strong brands that offer value to consumers. This study has established that strong brands act as a vital differentiating agent in the competitive market place, fetching better prices and enhancing customer engagement. It is imperative that brands are positioned in line with customer needs and key attributes to provide customers with a unique, exciting and distinct offer. The performance of the service offering is crucial as it has an overall impact on service quality, brand image and competitiveness.

Critical encounters provide an important basis to understand service processes. Therefore, it is essential to critically consider and examine service touchpoints in order to have a comprehensive understanding of the entire service system. This would significantly help companies attain service quality, value, sustainability and profitable customers. Boeing has embraced a customer-centered design necessary for a successful brand and the delivery of outstanding airline customer service.

Whilst this study makes some valuable contributions, inevitably, it also has its limitations. This study is based on a single jet airliner and therefore not all features of branding may be generalisable to other types of aircrafts and airline companies. However, using a single airliner seemed appropriate with the aim of the study, which was to investigate the features of the 787's branding strategies. This also enabled the researcher to acquire a deeper understanding of the key research domains. Accordingly, it is not certain if the implications of this study will be appropriate to other industries, product or service categories. In the light of the above, future studies could focus on different aircraft models to obtain a broader perspective of its branding features and strategies. Making a comparison between global aircraft manufacturers such as Boeing and Airbus could also be an intriguing phenomenon to investigate. These studies may not only be more generalisable but also provide greater insights and understanding of different branding features and strategies.

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