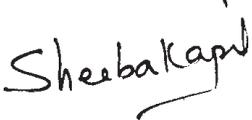


## FROM THE EDITOR'S DESK

The **2019-20 coronavirus pandemic** is an ongoing pandemic of coronavirus disease 2019 (COVID-19). The outbreak has already been declared pandemic by the World Health Organization (WHO) on 11 March 2020. Several Countries have locked down and declared national emergency. The health epidemic has taken toll on economic health as well. The economies are affected. All economic and Trade policies need to be redirected, redrafted and re-executed to alter the trade barriers and trade tariffs and support global trade requirement. China will be treated differently if not in an hostile way. Those countries who will face loss in exports may devalue their currencies, which may trigger other countries to also devalue their currencies.

This will further create economic disruption wherein global value chain network will also get affected. Global trade will be skewed and will defy traditional theories and polices. The stock market globally has already given leading indicator by turning downward. If countries are not proactive further downward spiralling will gain momentum and squeeze the remaining worth of market. Standalone countries need to act keeping global value network in mind. For example, the US has initiated the process by cutting interest rates citing an emergency situation. But global coordination of monetary, fiscal, trade and exchange rates policies is critically required.

  
(Dr. Sheeba Kapil)

**EDITOR : Dr. Sheeba Kapil**  
Professor (Finance) and Head-Publication  
Indian Institute of Foreign Trade, New Delhi

## MEMBERS OF EDITORIAL ADVISORY BOARD

- ◆ Dr Jitendra Mahakud  
Indian Institute of Technology Kharagpur  
Kharagpur, West Bengal
- ◆ Dr Chandra Shekhar Mishra  
Vinod Gupta School of Management  
IIT Kharagpur
- ◆ Dr Kanwal N. Kapil  
Management Development Institute (MDI)  
Gurugram, Haryana
- ◆ Dr Puja Padhi  
Indian Institute of Technology (IIT) Bombay  
Mumbai, Maharashtra
- ◆ Dr Pushendra Priyadarshi  
Indian Institute of Management (IIM)  
Lucknow, Uttar Pradesh
- ◆ Dr. Debdeep De  
Price Water House Coopers, PWC  
New Delhi
- ◆ Dr Jighyasu Gaur  
T.A. Pai Management Institute (TAPMI),  
Manipal, Karnataka
- ◆ Dr Pratyush Banerjee  
Birla Institute of Technology & Science  
Pilani (BITS Pilani), Rajasthan
- ◆ Dr Rashmi Agarwal  
Institute of Management & Technology (IMT)  
Ghaziabad, Uttar Pradesh
- ◆ Dr Ritesh Tiwari  
ICFAI Business School (IBS)  
Hyderabad, Telangana
- ◆ Dr Sudeep Rathee  
New York Institute of Finance  
Hong Kong
- ◆ Dr Sven Dahms  
James Cook University Singapore  
Singapore
- ◆ Dr Anil Dubey  
Skyline University  
University of Sharjah, UAE
- ◆ Dr Ritu Gupta  
T.A. Pai Management Institute (TAPMI)  
Manipal, Karnataka
- ◆ Dr Shri Prakash  
Former Director  
Academy of Third World Studies  
JMI Central University, New Delhi
- ◆ Dr Siddhartha S. Padhi  
IIM Kozhikode  
Kerala, India
- ◆ Dr Trilochan Tripathy  
XLRI Xavier School of Management  
Jamshedpur, Jharkhand
- ◆ Dr Tripti Singh  
School of Management Studies  
Motilal Nehru National Institute of Technology  
Prayagraj, Uttar Pradesh
- ◆ Dr Rakesh K. Mishra  
Indian Oil Corporation Limited  
Pipelines Head Office, Noida

# The Impact of Research and Development in Merger and Acquisition

*Isha Gupta\**, *Nandita Mishra\*\** and *Naliniprava Tripathy\*\*\**

The competition worldwide is getting intensified, to attain and uphold a position in competition, company's uses innovation as a source more frequently. In this perspective, Mergers and Acquisitions (M&A) strategy tends to be utilized in gaining access to over technological advancement. Accordingly, the companies merges with firms that attains positive impact from R&D activities of firms. The main motive of M&A is to realize synergies and gain from efficiency, whereas this effect is created by merging of two firms. The economies of scale and scope is the reason that creates synergies and economic gains in the merging of the firms. For example, recently the consolidation of 10 public sector banks into four will create a positive impact due to increased operational scale and capital, and improved corporate governance in the long run. According to Moody's rating agency, "A larger scale will also enable PSU Banks to increase technology investment, which is an area where they have lagged private sector peers"<sup>1</sup>.

The current study attempts to examine whether M&A creates trade-off between synergy success and efficiency gains through examining the impact on R&D. In present study, the performance of M&A is related to Non-Financial Sector excluding the service sector. For this analysis, two multiple linear regression model being formed in which the core independent variables is R&D expenses of acquirer. This way the findings of this study supports that M&A creates trade-off between synergy success and efficiency gains and R&D creates "high synergy low efficiency scenario". The results of the study is mainly concerned about trade-off situation creates by M&A which concludes that M&A leads to trade-off "high synergy-low efficiency" in R&D and trade-off "high synergy high efficiency" scenario exists in firm size. Thus, results states that R&D seems to play a vital role in improving performance of merging firms post M&A.

**Keywords:** Synergy Success, Efficiency Gains, R&D, M&A, Innovation, Trade-off.

JEL Classification: G34

## 1. Introduction

IN conducive business worldwide Mergers and Acquisitions (M&A) is being practiced as an efficacious opportunistic tool for corporate restructuring from ages since 1897. During the past decades, the sphere of M&A has changed profoundly. Due to proportional expedition of the regulatory ecosystem and especially due to the development of the IBC, the year 2017 was an epic year for corporate restructuring and mergers and acquisitions. When these phenomenon are observed jointly with the evidence that M&A has been used as a strategic tool worldwide, it comes to notice that this sphere has gaining importance in world's corporate finance and corporate strategy.

---

\*\* Research Scholar, Amity University, Noida.

\*\* Associate Professor, Amity University, Noida.

\*\*\*Professor & Dean Research, Indian Institute of Management, Shillong.

---

<sup>1</sup> Details obtained from moody.com

Figure 1 explains the M&A deals in form of values in the year 2018 and 1<sup>st</sup> quarter of 2019 which shows that there is significant consolidation directed by an economically viable and optimistic market. The remarkable feature of present deals are the volume and

pace at which these are occurring. Despite this, the M&A has faced a significantly less drive with 110 deals worth \$12.5 billion in 2019 as compared to 118 deals worth \$18.7 billion in 2018 (Grant Thornton, 2018). For example, recently the consolidation of ten public sector

banks into four (Merger 1 is 2<sup>nd</sup> largest PSB merger; Merger 2 is 4<sup>th</sup> largest PSB merger; whereas, Merger 3 is 5<sup>th</sup> largest merger and Merger 4 is 7<sup>th</sup> largest merger) will create a positive impact due to increased operational scale and capital, and improved corporate governance in the long run. According to Moody’s rating agency, “A larger scale will also enable PSU Banks to increase technology investment, which is an area where they have lagged private sector peers” (Figure 2).

The fundamental objective is to dominate the market position through consolidation and to enlarge geographical area with the monetization of non-core assets to strengthen the core operations. This is due to fact that consolidated companies requires extensive investment to take advantage of potential synergy and to improve efficiency, which leads to trade-off between synergy success and efficiency gains. During the implementation of M&A, core issue involves forefending a potential trade-off between two main objectives of M&A by managing balance between them. In other terms, M&A is considered to be profitable if it results into synergy success coupled with efficiency gains, which leads to increase in revenue growth in addition with improving profitability. Though, if it results into success of only one objective, synergy success or efficiency gains, then it could be taken as M&A had not attained the favourable outcome. At the same time, if M&A falls short in achieving both synergy and efficiency, then it may be taken as M&A has failed.

**FIGURE 1**  
**M&A DEALS WITH VOLUME**

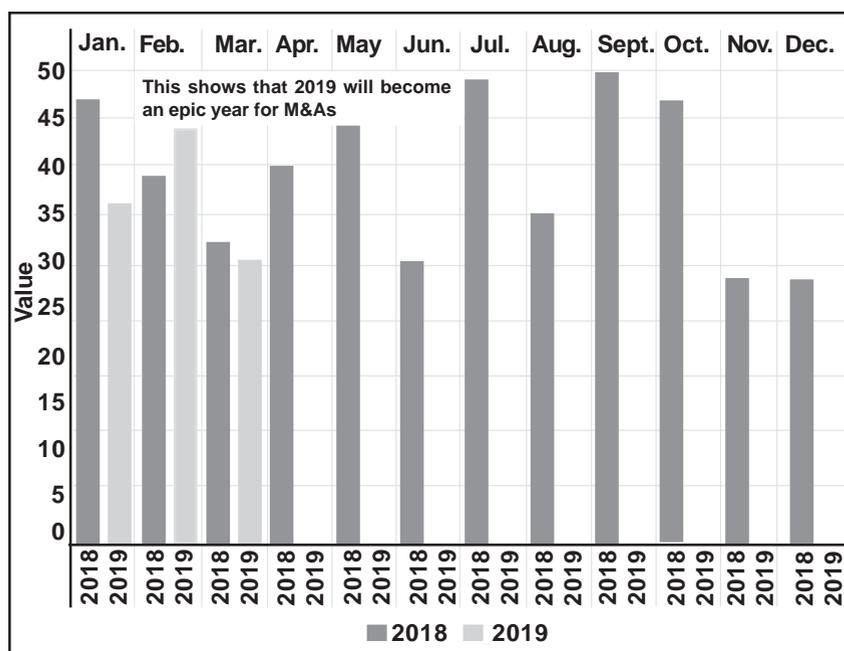


Figure 2

**MERGER OF PUBLIC SECTOR BANKS**



Source: Quora.com<sup>1</sup>

<sup>1</sup> <https://www.quora.com/Which-nationalised-banks-are-merged-on-30-August-2019-How-will-this-merger-affect-the-banking-sector-and-the-Indian-economy>

There is an extensive literature both theoretical and empirical, which analyses the impact of M&A on innovation performance (or R&D). Despite that, there is no conclusive empirical evidence in relation to implication of M&A on R&D. There are some studies found that M&A is positively related to innovation performance (Barkema and Vermeulen, 1998; Ahuja and Katila, 2001; Cassimanetal, 2005; Cloudt *et al.*, 2006; Fang, 2007; Cefis and Marsili, 2015) whereas other studies argues that M&A is negatively related to innovation performance. (Hall, 1990; Hitt *et al.*, 1990; Blonigen and Taylor, 2000; Harrison *et al.*, 1991; Szucs, 2014). Nevertheless, there are certain studies that conjointly studies the impact of M&A on potential trade-off between synergy success and efficiency gains and effect on R&D.

On the basis of statements stated, several important question arises:

1. Is the M&A able to achieve both Synergy Success and Efficiency Gains?
2. Does the M&A leads to trade-off between Synergy Success and Efficiency Gains?
3. Does Synergy Success and Efficiency Gains Impacts R&D?

This study aims to find answer of these research questions, along with intends to bridge the research gaps of the literature. This paper contributes to examine the potential trade off that may exist between synergy success and efficiency gains through studying impact on innovation performance (R&D Expenses). It is directly related to general objective of M&A viz. economic benefit or profitability but it is not identical. This paper is summarized in following sequence. Section 2 outlines the review of relevant existing empirical literature, on the basis of which objectives are formed which is documented in Section 3. Section 4

describes the data and research methodology used in analysis of relation between innovation and potential trade-off between synergy success and efficiency gains. The empirical findings is documented into Section 5. The Section 6 includes conclusion and Section 7 outlines the implications of study.

**2. Literature Review**

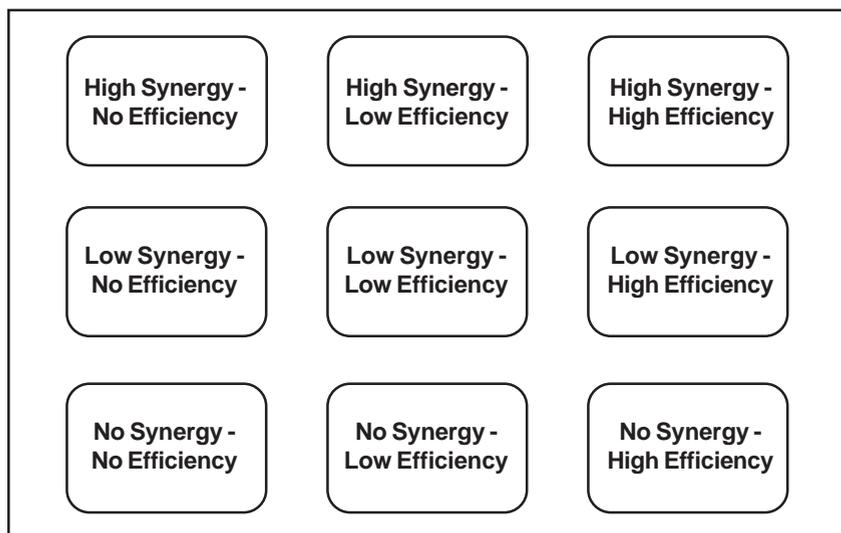
This section deals with selected studies concerning our topic of interest a summary of which are provided below:

Some authors argues that during seminal study of M&A from a sectoral point of view they observed that M&A are considered as a strategy to expand control in expeditiously changing environment of working world, R&D intensity of industries. Some M&A may leads to crucial changes in the technological competencies of the acquiring company. Though, the contemporary empirical literature provides unambiguous evidences in relation to impact of M&A on innovation.

Ahuja and Katila (2001) examined whether in chemical industry acquisition creates impact on innovation performance of acquiring firms. They distinguish between the technological acquisition and non-technological acquisition. They observed that absolute size increases innovation performance while relative size reduces innovation performance whereas in case of non-technological acquisition they found insignificant effect on innovation performance.

Bena and Li (2014) with large patent data from 1984 to 2006

**FIGURE 3**  
**CONCEPTUAL MODEL: POTENTIAL OUTCOME OF SYNERGY SUCCESS AND EFFICIENCY GAINS**



revealed in their empirical evidence that if companies procure patents in immense portfolios and R&D expenses in limited form than it is a acquired company whereas companies with immense R&D expenses and inconsiderable progress in patent outputs than it is a target company. They come to the conclusion that synergies gained from merging innovation capabilities is key factor of acquisition.

Carmine (2009) studied the effects of mergers on the R&D outcomes of merged companies in pharmaceutical industry from 1988 to 2004. He concluded that there is no association between the higher level of technological relatedness and better R&D outcomes.

Cassiman *et al.* (2003) examined that M&A partners technological and market relatedness has significant impact on R&D inputs, outputs, performance and organizational structure. They concluded that R&D efficiency and R&D performance significantly increases when merged firms are technologically complementary as compared to firms that are technologically substitutive firms. If firms were product rivals in the market then its efficiency gains will be insignificant in relation to non-rival firms.

Wen and Liu (2011) analyzed the association among mode of technology acquisition and firm's performance in innovation. They observed that if technology acquisition increases, innovation performance of acquiring firms has non-significant impact post the M&A.

Fernandez *et al.* (2018) explored the large European firms impacts

on innovation and profitability post M&A. They observed that in short and long term R&D intensity and in long term profitability is positively influenced by M&As. Their empirical evidence reveals that these effects can differ due to timing and magnitude.

Hagedoorn and Duysters (2002) studied the impact of related M&As and unrelated M&A on economic performance through strategic and organizational fit. The result shows that strategic and organizational fit of company has impact on technological performance of company.

Rozen Bakher (2018) examined whether the M&A strategy per leads to trade-off between synergy success and efficiency gains through mediating the variation in workforce size. Their findings reveals that change in workforce size leads to "win synergy-lose efficiency scenario". He also found that international M&A leads to synergy potential, whereas, vertical and conglomerate M&A creates not either synergy or efficiency.

Shaughnessy and Flanagan (1998) studied the two main motives behind the M&A strategy viz. the synergy success and inadequate targets. They found that unbalance between these two may create potential trade-off between synergy success and efficiency gains. Whereas Porter (1985) found that achieving synergy by consolidation of more than one company to strengthen the relative benefits which may expand market share of combined firms through increase in revenue growth.

Chatterjee (2007) studies the reason behind the failure of M&A

which is according to him is traditional notion of synergy. They found that it is complex to assess the nature of synergies at the negotiation stage which may exacerbates the overpayment and unpredicted integration problems.

Homberg *et al.* (2009) studies whether difference in form of relatedness which is a means of synergies leads to success in acquisition or not. They found that synergies arising out of relatedness depends on characteristics of industry, country and investor.

Rhoades (1998) studied the nine case studies of bank mergers in relation to efficiency effects. The empirical evidence shows that all banks resulted into significant cost reduction as compared to premerger. Out of nine, four were able to improve cost efficiency but five were not.

### 3. Objective of the Study

The objective of this study is to examine whether M&A creates trade-off between synergy success and efficiency gains and also to examine the impact of synergy success and efficiency gains on R&D.

## 4. Data and Methodology

### 4.1 Data

The sample of study includes companies that were engaged in M&A activity in the year 2015. These stock of these companies have been traded on Bombay Stock Exchange (BSE). The secondary source of data is used to data for the present study. The major sources of data are Prowess database of CMIE (Centre for Monitoring Indian

Economy), Captialine, the National Stock Exchange (NSE) website and the Bombay Stock Exchange (BSE). In the year 2015, total firms involved in M&A were 601 which includes Non-Financial Sector. Here Non-Financial sector means the sector classification defined by Prowess, CMIE which divides sector into two

categories Financial Sector and Non-Financial Sector. The Non-Financial Sector includes Manufacturing, Mining, Electricity, Construction & Real Estate and Services sector. This study includes all sectors except service sector. CMIE database prowess has been used in identifying the initial

announcements of M&A by public-listed companies. The data has undergone through many filters, to avoid the influence of outlier's values that are extreme has been removed from the data. After excluding these, the final dataset has only 64 firms.

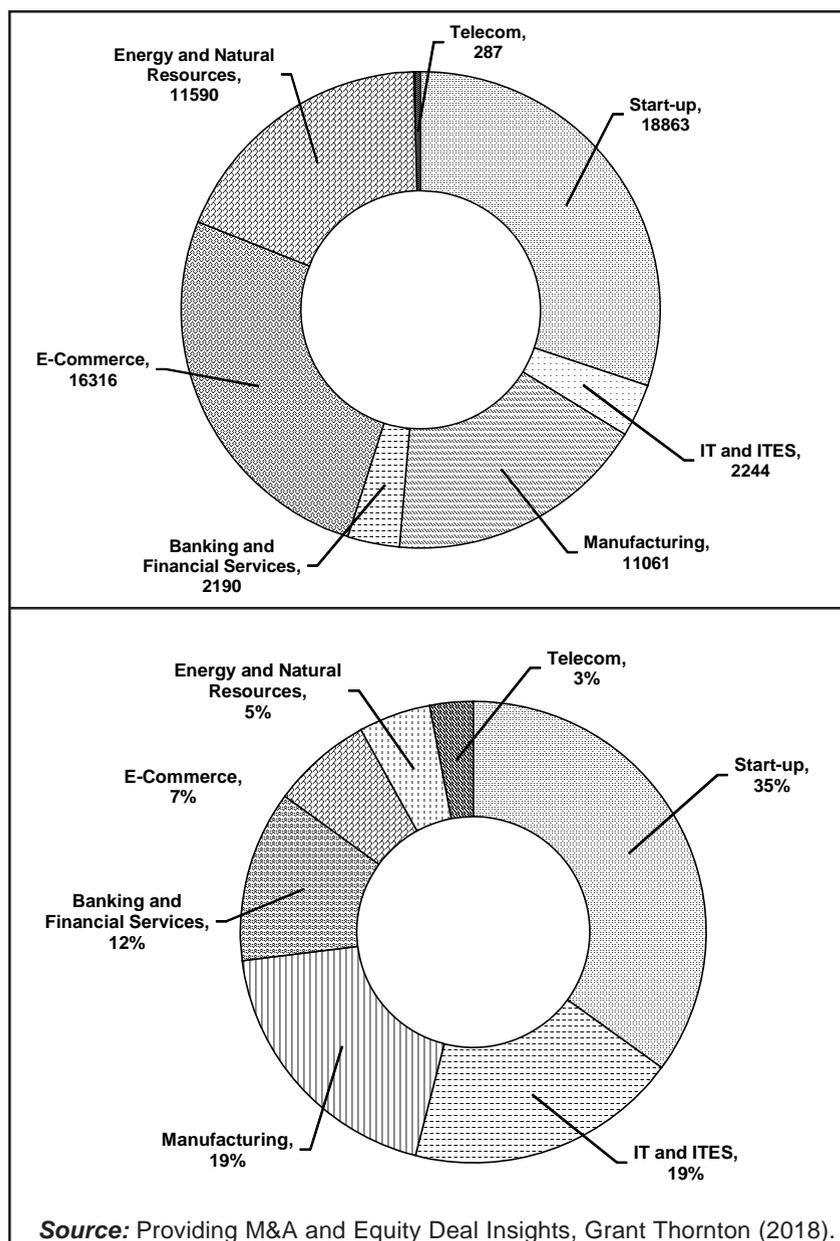
According to Ramaswamy (1997) including data after many years of M&A may disrupt the rule of "clean data". Accordingly, considering a longer time lag post the M&A in measuring the M&A success can invalidate the results due to another contributing factors that would impact the valuation of M&A success, viz. in the long assessment period acquirer may buy another target or it may itself get merged into another firm. Thus, the present study includes only M&A that merged or acquired once in a year i.e. single M&A (Lubatkin, 1987) rather than firms that merged or acquired multiple firms in the year M&A occurred.

Figures 4(a) and 4(b) shows the sectoral distribution of Mergers and Acquisitions based on data released in year 2018 in the form of deal volume and value (\$ mn). Telecom Sector is leading sector which holds 29 per cent of total deal value whereas in case of deal volume start-up holds 35 per cent of total deal volume. Bharti Infratel and Indus Towers merged to create a \$14.6 bn tower giant.

#### 4.2 Variables

The study includes the following variables: Dependent Variable, Independent Variable and Control Variable.

**FIGURES 4(a) and 4(b)**  
**SECTORAL DISTRIBUTION**



## Dependent Variables

The study included two dependent variable to examine potential trade-off that may exist between the main two objectives of M&A i.e. synergy success and efficiency gains. This study uses two models one for synergy success and other for efficiency gains.

*Synergy Success:* According to Rani *et al.*, 2016, "Synergy results when the value of the combined firm is greater than the sum of the acquirer firm and target firm as individual firms and this can be achieved by combining firms in the same industry sector (operational synergy), when firms have different financial resources (financial synergy) or different managerial resources (managerial synergy)." In this study, it is measured by change in revenue between the pre M&A period and post M&A period.

*Efficiency Gains:* It can be obtained through rationalization, economies of scale, technical advancement and real cost saving, firm level efficiencies and industry level efficiencies, fixed cost and variable cost, efficiencies in relevant market and efficiencies in other markets. Therefore, it can be achieved if Total Asset of combined firms are more than the sum of Total Asset of individual firms before the M&A. Thus, it is examined by change in the Total Asset Turnover Ratio between the pre M&A period and post M&A period.

## Independent Variables

The present study includes R&D Expenses, Debt-Equity Ratio, Market Capitalization, Asset Utilization Ratio, Net working Capital and Total Asset and

Liabilities Ratio as Independent Variables to explore which variable is more susceptible to a potential trade-off between synergy success and efficiency gains. These variables were examined using the change in respective variable between the pre M&A period and post M&A period.

*R&D Expenses:* Research and Development Expenses means the current costs borne and recorded in accounting statement of the company whereas it excludes the capital expenditure on research and development. Therefore, this variable is measured by change in R&D of acquirer and target company pre M&A period and post M&A period.

*Debt Equity Ratio:* It measures the leverage of company which is computed by dividing its total liabilities by equity share. It indicates the ratio of equity verses debt used by company in meeting its financing requirements of company. Thus, this variable is measured by change in debt equity ratio of acquirer and target company pre M&A period and post M&A period.

*Market Capitalization:* Market Capitalization, commonly known as Market Cap, refers to the total market value of outstanding shares of publicly traded companies. This variable was examined by using the Market Capitalization of the acquirer and target pre M&A period and post M&A period.

*Assets Utilization Ratio:* The asset utilization ratio calculates that for every rupee of assets of company how much total revenue has been generated. In other words, how much revenue has been earned from

assets of company. This ratio is frequently used to compare a company's efficiency over time. This variable was examined by using the Assets Utilization ratio of the acquirer and target pre M&A period and post M&A period.

*Net working Capital:* It means the circulating capital used for day to day expense and is measured by calculating difference between current assets and current liabilities. It indicates company have sufficient funds to invest in other operating activities of company. It is used as a financial metric to examine the liquidity capacity of company. This study considers the difference between Net Working Capital of acquirer and target pre M&A and post M&A.

*Total Asset to Liabilities Ratio:* It measures the use of total liabilities in asset formation. This ratio should be less than 1 which indicates better solvency. This study considers the difference between Total Asset and Liabilities Ratio of acquirer and target pre M&A and post M&A.

## Control Variables

The study includes two control variables which is examined through the ratio of acquirer after the M&A and of target company before M&A took place.

*Organizational Size Ratio:* According to Homberg, 2009, "The organizational size can be measured in many ways viz. through the difference between total assets, revenues and the number of employees of the acquirer and target." This study considers the difference between total assets of acquirer and target pre M&A and post M&A.

*Profitability Ratio:* This variable was examined by using the profitability ratio of the acquirer and target pre M&A period and post M&A period. This ratio defines the profit that is before interest earned on capital employed in the business.

### 4.3 Methodology

The present study uses a Multiple Regression Model. This study used STAT 14.0 to analyze the model. The present study multi-collinearity problem has been indicated by variance inflation factor (VIF) test which is 1.322 (Mean VIF). According to Chatterjee & Price (1981) the VIF index should be not be more than 10, higher the index indicates higher the multi-collinearity problem.

### 4.4 Econometric Model

The impact of M&A on synergy success and efficiency gains through R&D can be estimated by using following model:

Regression Equation (1) for Synergy Success:

$$\text{Synergy}_i = \alpha + \beta_1 \text{RD}_i + \beta_2 \text{FirmSize}_i + \beta_3 \text{ROCE}_i + \beta_4 \text{DebtEquity}_i + \beta_5 \text{Marketcap}_i + \beta_6 \text{NetWorkCap}_i + \beta_7 \text{AssetUtilise}_i + \beta_8 \text{TotalAssetLiab}_i + \epsilon_i \quad (1)$$

Regression Equation (2) for Efficiency Gains:

$$\text{Efficiency}_i = \alpha + \beta_1 \text{RD}_i + \beta_2 \text{FirmSize}_i + \beta_3 \text{ROCE}_i + \beta_4 \text{DebtEquity}_i + \beta_5 \text{Marketcap}_i + \beta_6 \text{NetWorkCap}_i + \beta_7 \text{AssetUtilise}_i + \beta_8 \text{TotalAssetLiab}_i + \epsilon_i \quad (2)$$

The equation (1) deals with impact of independent variables on dependent variable viz. synergy

success whereas the equation (2) deals with impact of independent variables on dependent variable viz. efficiency gains.

## 5. Results and Discussions

The present study aimed to examine whether M&A creates potential trade-off between synergy success and efficiency gains through observing impact on R&D. It was hypothesized that both synergy success and Efficiency Gains has significant impact on R&D. Table 1 concludes the result of the mean and descriptive statistics of the variables in the study. The Correlation matrix between the variables is shown by Table 2. The Multiple Regression Model statistics is revealed in Tables 3 & 4.

As the result shown in Table 1, the mean of Synergy success is 25.446 which is positive whereas standard deviation is 64.558. In Efficiency Gains and R&D mean is -0.504 and -0.963 respectively which is negative and standard deviation is 41.157 and 4.803 respectively. Asset Utilization has the highest mean and standard deviation which is 1121.885 and 5587.977 respectively.

The correlation of R&D with Synergy success is 0.1029 and with efficiency gains is 0.0977 which is positive. Similarly, firm size also has positive correlation with synergy success and efficiency gains 0.3149 and 0.3685 respectively. Though, ROCE has negative correlation (-0.0162) with Synergy Success whereas with Efficiency Gains has positive correlation which is 0.1189. Debt-Equity Ratio, Market Capitalization and Asset Utilization has negative

	The constant value (Intercept)	$\alpha$
	The slope of Regression Line (Regression Coefficient)	$\beta$
Dependent Variable	Synergy Success	Synergy
	Efficiency Gains	Efficiency
Independent Variable	R&D Expenses	RD
	Debt-Equity Ratio	Debt Equity
	Market Capitalization	Marketcap
	Asset Utilization Ratio	Asset Utilize
	Net Working Capital	Net Work Cap
	Total Asset and Liabilities Ratio	Total Asset Liab
Control Variable	Organizational Size Ratio	Firm Size
	Profitability Ratio	ROCE
Error Term	Error Term	$\epsilon$

Source: Author.

correlation with both synergy success and efficiency gains. However, Firm Size, Net Working Capital and Total Asset Liabilities has positive correlation with synergy success and efficiency

gains. The details of Correlation through graphs is presented in Appendix 1.

Table 3 depicts the results of the multiple regression model of synergy success. Foremost, the

results of the VIF tests shows that there is no multicollinearity problem during the analysis. Further, the results shows that the synergy success is positively correlated to the R&D expenses of the merging firms. The findings revealed that R&D is significant as p-value is 0.019 at level of 5 per cent significance level. It infers that higher R&D expenses will leads to synergy success. Also, the Return on Capital Employed (ROCE) and the Asset Utilization Ratio though, is negatively correlated with synergy success but has significant effect on synergy as p-value is 0.040 and 0.041 respectively at 5 per cent level of significance. It implies that higher the Return on Capital Employed higher will be the synergies success. Similarly, Asset Utilization Ratio if company's asset are utilized efficiently it will leads to increase in synergies. Whereas

**TABLE 1**  
**DESCRIPTIVE STATISTICS OF VARIABLES (N=64)**

Variable	Mean	Standard Deviation	Minimum	Maximum
Synergy	25.446	64.558	-49.649	429.31
Efficiency	-0.504	41.157	-76.411	195.918
R&D	-0.963	4.803	-31.203	0
Debt Equity	96.314	3405.57	-13600	21168
Market Capitalization	93.684	149.716	-68.263	595.295
Assets Utilization	1121.89	5587.98	-748.99	32601.2
Net Working Capital	3.52	227.193	-1407.4	752.959
Total Asset to Liabilities	29.639	65.07	-40.834	434.961
Firm Size	28.38	40.703	-40.154	164.225
ROCE	-9.869	103.554	-529.4	309.06

**Source:** Author's Own Compilations.

**TABLE 2**  
**CORRELATION MATRIX**

	Synergy	Efficiency	RD	Firm Size	ROCE	Debt Equity	Market Capitalization	Asset Utilization	Net Working Capital	Total Asset
Synergy	1									
Efficiency	0.3418	1								
RD	0.1029	0.0977	1							
Firm Size	0.3149	0.3685	0.15022	1						
ROCE	-0.0162	0.1189	-0.0261	-0.2248	1					
Debt Equity	-0.1371	-0.0043	0.0701	-0.2266	0.5095	1				
Market Capitalization	-0.0658	-0.031	-0.0675	0.0715	0.0952	0.0393	1			
Asset Utilization	-0.0289	-0.0625	0.0354	-0.1205	0.0611	-0.0147	0.2636	1		
Net Working Capital	0.3309	0.0226	-0.0013	-0.1416	0.1204	0.0614	0.0329	-0.0045	1	
Total Asset	0.8513	0.1743	0.0892	0.5323	-0.2062	-0.2207	0.0082	-0.0045	0.2176	1

**Source:** Author's Own Compilation.

**TABLE 3**  
**MULTIPLE REGRESSION RESULT FOR SYNERGY SUCCESS MODEL**

Synergy	Coef.	St. Err.	t-value	p-value	(95%Conf Interval)	
RD	0.599	0.247	2.42	0.019	0.103	1.094 **
Firm Size	-0.229	0.182	-1.26	0.213	-0.594	0.136
ROCE	0.103	0.049	2.1	0.04	0.005	0.202 **
Debt Equity Ratio	-0.001	0.001	-1.43	0.159	-0.002	0
Market Capt	-0.038	0.031	-1.21	0.0231	-0.101	0.025
Assest Utilisation	0.001	0	2.09	0.041	0	0.001 **
Networking Capital	0.027	0.02	1.36	0.178	-0.013	0.067
Total Assets Liab	0.917	0.054	16.97	0	0.809	1.025 ***
Constant	9.915	4.42	2.24	0.029	1.054	18.775 **
Mean Dependent var	26.501	SD dependent var		64.518		
R-squared	0.792	Number of obs		63		
F-test	98.161	Prob> F		0		
Akaike crit. (AIC)	621.961	Bayesian crit. (BIC)		641.204		

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Source:** Author's Own Compilations.

**TABLE 4**  
**MULTIPLE REGRESSION RESULT FOR EFFICIENCY GAINS MODEL**

Synergy	Coef.	St. Err.	t-value	p-value	(95%Conf Interval)	
RD	0.363	0.326	1.11	0.27	-0.291	1.017
Firm Size	0.434	0.237	1.83	0.073	-0.041	0.909 *
ROCE	0.09	0.037	2.4	0.02	0.015	0.165 **
Debt Equity Ratio	0	0.001	-1.51	0.615	-0.002	0.001
Market Capt	-0.021	0.045	-0.47	0.64	-0.112	0.069
Assest Utilisation	0	0.001	-0.16	0.873	-0.001	0.001
Networking Capital	0.012	0.023	0.53	0.597	-0.035	0.06
Total Assets Liab	-0.026	0.059	-0.44	0.66	-0.145	0.093
Constant	-8.354	5.789	-1.44	0.155	-19.961	3.253
Mean Dependent var	0.18	SD dependent var		41.119		
R-squared	0.181	Number of obs		63		
F-test	3.078	Prob> F		0.006		
Akaike crit. (AIC)	651.446	Bayesian crit. (BIC)		670.735		

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Source:** Author's Own Compilations.

Total Asset Liabilities Ratio is positively correlated and significant as p-value is 0.000 at 1 per cent level of significance. While other variables firm size, debt-equity ratio and market capitalization are insignificant at 5 per cent level of significance which shows they are negatively related to synergy success.

Since F-statistics is 8.6 with probability value of 0.000, it concludes that overall model fits good. Similarly, R-squared of model is 0.79 which means 79 per cent of variation in dependent variable is explained by Independent Variable. Hence, predictability of model is satisfactory.

Table 4 depicts the results of the multiple regression model of synergy success. Foremost, the results of the VIF tests shows that there is no multicollinearity problem during the analysis. Further, the Return on Capital Employed (ROCE) is positively correlated with efficiency gains and significant as p-value is 0.073 at 1 per cent level of significance. It implies that higher the Return on Capital Employed higher will be the efficiency gains. Similarly, Firm Size is positively correlated with efficiency gains and significant as p-value is 0.020 at 5 per cent level of significance. While other variables R&D, debt-equity ratio, asset utilization, total asset liabilities and market capitalization are insignificant at 5 per cent level of significance which shows they are negatively related to efficiency gains.

Since F-statistics is 3.078 with probability value of 0.006, it concludes that overall model fits

good. Similarly, R-squared of model is 0.181 which means 18 per cent of variation in dependent variable is explained by Independent Variable. Hence, predictability of model is satisfactory.

**6. Conclusion**

The present study focuses on a Non-Financial Sector excluding service sector, even though a significant one and with sample data including a wide range of companies, examined in relation to pre and post M&A period. The results of this study might produce industry specific and factor specific results, additional useful observations could be yield if study examined in different scenario. The conclusion of this study is inferred by caveating this in mind.

The analysis of this study highlights the originality of this research. This study testifies that M&As contributes in improving the technological performance

post the M&A of acquiring firms and creates synergy success through R&D expenses whereas it has no significant impact on efficiency gains. However, it is to be emphasized that M&A creates a trade-off between synergy success and efficiency gains. These crucial motives were formerly examined in existing literature but from the point of view of general impact of M&A on economic benefits and profitability. This study concludes that the M&A creates a trade-off between synergy success and efficiency gains and suggest that if acquiring company’s increases expenditure on R&D it can achieve success in synergies which will leads to technological innovation and has a positive impact on technological advancement after M&A of acquiring companies. Whereas ROCE significantly impact both synergy success and efficiency gains. The findings of the study are in sync with the findings of

Triguero and Fernandez (2018), Ziva Rozen-Bakher (2017), Ma and Liu (2016) international studies.

The results of the study is mainly concerned about trade-off situation creates by M&A. However, the study reveals that the M&A leads to trade-off “high synergy-low efficiency” in R&D and trade-off “high synergy high efficiency” scenario exists in firm size.

**7. Implications of the Research**

The present study advances understanding of the impact of Synergy success and Efficiency gains on R&D and will enrich existing literature regarding the trade-off situation of Synergy success and Efficiency gains which has various management and policy implications. However, the notion of M&A get advanced theoretically as it is considered as an expansion strategy for the firm and elucidated as an eccentric form

**TABLE 5**  
**OUTCOME OF TRADE OFF WITH VARIABLES**

Trade-off Outcomes	Control Variables		Independent Variables					
	Firm Size	ROCE	R&D	Debt Equity	Market Capitalization	Asset Utilization	Net Working Capital	Total Asset Liabilities
High Synergy-No Efficiency								
High Synergy-Low Efficiency		√	√		√		√	
High Synergy-High Efficiency	√							
Low Synergy-No Efficiency								
Low Synergy-Low Efficiency				√	√		√	
Low Synergy-High Efficiency								
No Synergy-No Efficiency								
No Synergy-Low Efficiency								
No Synergy-High Efficiency								

of open innovation. The concept of “open innovation” was propounded by Chesbrough (2003) and has become contemplated issues in the corporate finance literature in the past few years. The results reveals that independent variables studied in this paper neither leads to a “high synergy-high efficiency” nor “low synergy-low efficiency” which may justifies the scenario “half-empty glass” or “half-full glass” of M&A. The results were concerned about whether M&A leads to trade-off between synergy success and

efficiency gains through examining the impact on R&D. However, R&D leads to trade-off “high synergy-low efficiency” which means if companies increases expenditure on R&D it will result in higher synergy success but with a negative effect on efficiency gains. Therefore, the study focuses on the requirement of management to strike a balance between gaining efficiency and attain the potential synergies post M&A to endeavor a “high-high levels in both scenarios”. Most notably, intense synergy success and efficiency gains occurs when

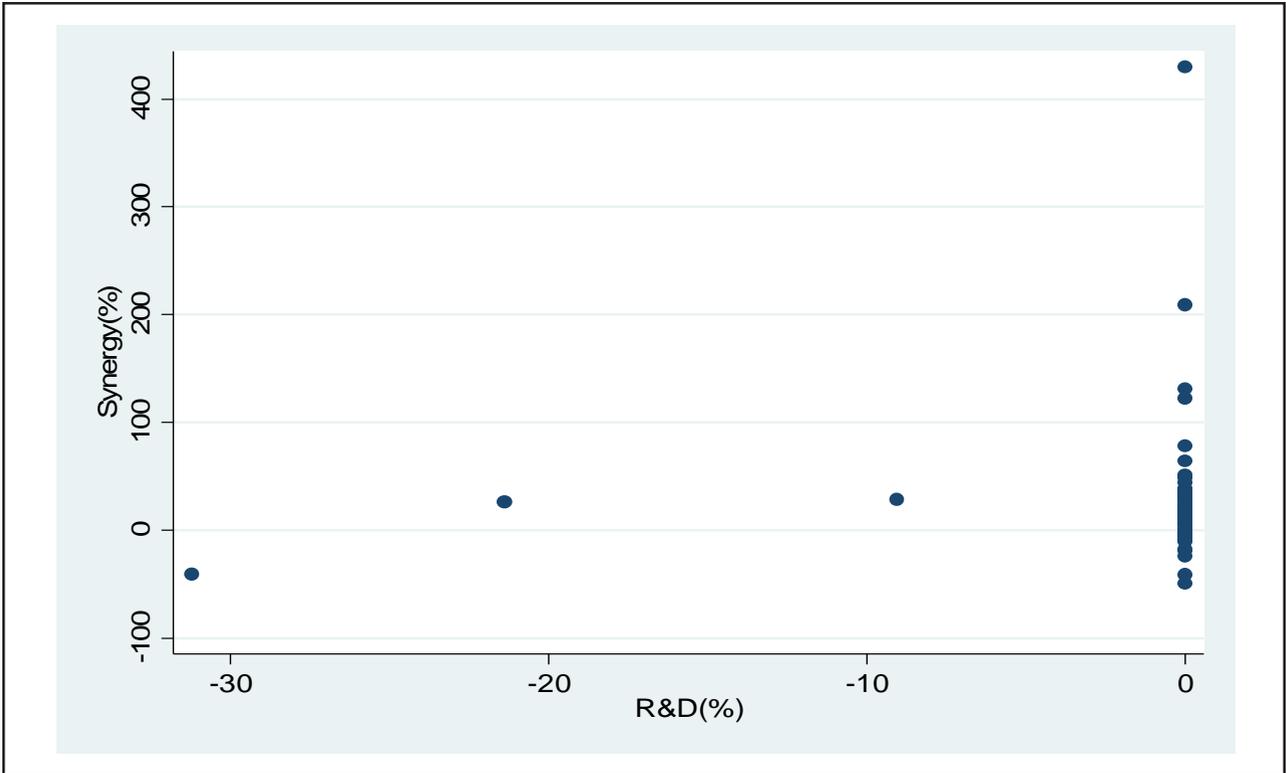
merging firms advances their technology through attaining economies of scale and scope between merging and merged firms. The reduction in competition can be a result of positive influence of M&A reflected through profits of the company post M&A. However, this studies suggest that if firms attains advancement in technological capabilities by a means of merging, then it leads to be an important strategic advantage for companies worldwide.

#### BIBLIOGRAPHY

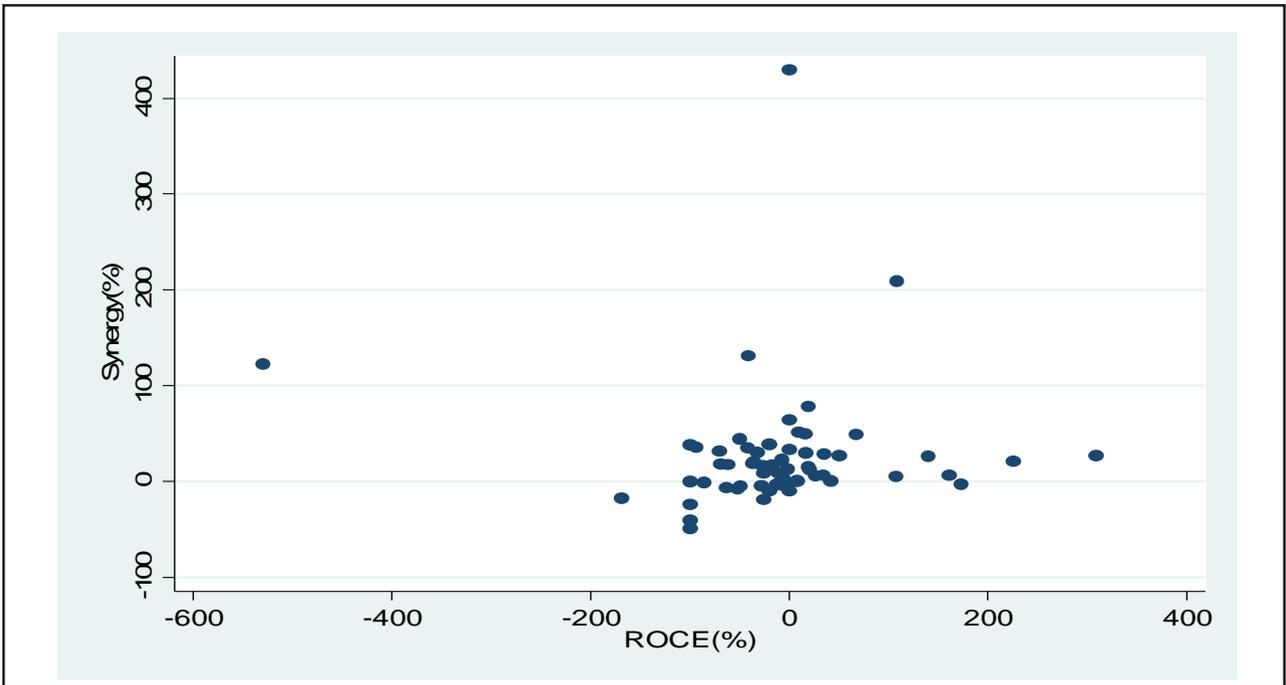
- Ahuja, G., and R. Katila (2001), “Technological Acquisitions and the Innovation Performance of Acquiring Firms: A Longitudinal Study”, *Strategic Management Journal* 22 (22), pp. 197-220.
- Bena, J., and K. Li (2014), “Corporate Innovations and Mergers and Acquisitions”, *The Journal of Finance* 69 (5), pp. 1923-1960.
- Blonigen, B.A. and Taylor, C.T. (2000), “R&D Intensity and Acquisitions in High-Technology Industries: Evidence from the US Electronic and Electrical Equipment Industries”, *Journal of Industrial Economics*, Vol. 48 No. 1, pp. 47-70.
- Bradley, M., Desai, A., and Kim, E.H. (1988), “Synergistic Gains from Corporate Acquisitions and their Division Between the Stockholders of Target and Acquiring Frms”, *Journal of Financial Economics*, 21(1), pp. 3-40.
- Calipha, R., Tarba, S.Y. and Brock, D. (2010), “Mergers and Acquisitions: A Review of Phases, Motives, and Success Factors”, *Advances in Mergers & Acquisitions*, Vol. 9 No. 1, pp. 1-24.
- Carmine, O. (2009), “Mergers and Innovation in Big Pharma”, *International Journal of Industrial Organization*, 1, pp. 70-79.
- Cassiman, B., M.G. Colombo, P. Garrone, and R. Veugelers (2003), “The Impact of M&A on the R&D Process: An Empirical Analysis of the Role of Technological and Market Relatedness”, *Research Policy* 34 (2), pp. 195-200.
- Cefis, E. and Marsili, O. (2015), “Crossing the Innovation Threshold Through Mergers and Acquisitions”, *Research Policy*, Vol. 44 No. 3, pp. 698-710.
- Chatterjee, S. (2007), “Why is Synergy so Difficult in Mergers of Related Businesses?”, *Strategy and Leadership*, Vol. 35 No. 2, pp. 46-52.
- Chesbrough, H.W. (2003), “Open Innovation: The New Imperative for Creating and Profiting from Technology”, Harvard Business School Press, pp. 40-90.
- Cloodt, M., J. Hagedoorn, and H.V. Kranenburg (2006), “Mergers and Acquisitions: Their Effect on the Innovative Performance of Companies in High-Tech Industries”, *Research Policy* 35, pp. 642-654.
- Goold, M. and Campbell, A. (1998), “Desperately Seeking Synergy”, *Harvard Business Review*, Vol. 76 No. 5, pp. 131-143.
- Gugler, K., Mueller, D.C., Yurtoglu, B.B. and Zulehner, C. (2003), “The Effects of Mergers: An International Compa-

- risson", *International Journal of Industrial Organization*, Vol. 21 No. 5, pp. 625-653.
14. Hagedoorn, J. and Duysters, G. (2002), "The Effect of Mergers and Acquisitions on the Technological Performance of Companies in a High-tech Environment", *Technology Analysis & Strategic Management*, Vol. 14 No. 1, pp. 67-85.
  15. Harrison, J.S., Hitt, M.A., Hoskisson, R.E. and Ireland, R.D. (1991), "The Effects of Acquisitions on R&D Inputs and Outputs", *Academy of Management Journal*, Vol. 34 No. 3, pp. 633-706.
  16. Hitt, M.A., Hoskisson, R.E. and Ireland, R.D. (1990), "Mergers and Acquisitions and Managerial Commitment to Innovation in M-form Firms", *Strategic Management Journal*, Vol. 11, Special Issue, pp. 29-47.
  17. Homberg, F., Rost, K. and Osterloh, M. (2009), "Do Synergies Exist in Related Acquisitions? A Meta-Analysis of Acquisition Studies", *Review of Managerial Science*, Vol. 3 No. 2, pp. 75-116.
  18. Kemal, M.U. (2011), "Post-merger Profitability: A Case of Royal Bank of Scotland (RBS)", *International Journal of Business and Social Science*, Vol. 2 No. 5, pp. 157-162.
  19. King, D.R., Dalton, D.R., Daily, C.M. and Covin, J.G. (2004), "Meta-analyses of Post-acquisition Performance: Indications of Unidentified Moderators", *Strategic Management Journal*, Vol. 25 No. 2, pp. 187-200.
  20. Kummer, C. and Steger, U. (2008), "Why Merger and Acquisition (M&A) Waves Reoccur: The Vicious Circle from Pressure to Failure", *Strategic Management Review*, Vol. 2, pp. 44-63.
  21. Liu, Y. (2011), "Empirical Analysis of Cross-Border M&A Performance of Listed Companies in China." *Commercial Research* 6, pp. 106-111.
  22. Lubatkin, M. (1987), "Merger Strategies and Stockholder Value", *Strategic Management Journal*, 8(1), pp. 39-53.
  23. Marris, R. (1964), "Theory of Managerial Capitalism", London: Macmillan.
  24. Rani, N., Yadav, S.S., and Jain, P.K. (2016), "Mergers and Acquisitions: A Study of Financial Performance, Motives and Corporate Governance", Springer Nature.
  25. O'Shaughnessy, K.C. and Flanagan, D.J. (1998), "Determinants of Layoff Announcements Following M&As: An Empirical Investigation", *Strategic Management Journal*, Vol. 19 No. 10, pp. 989-999.
  26. Ramaswamy, K. (1997), "The Performance Impact of Strategic Similarity in Horizontal Mergers: Evidence from the US Banking Industry", *Academy of Management Journal*, Vol. 40 No. 3, pp. 697-715.
  27. Rhoades, S.A. (1998), "The Efficiency Effects of Bank Mergers: An Overview of Case Studies of Nine Mergers", *Journal of Banking & Finance*, Vol. 22 No. 3, pp. 273-291.
  28. Rossi, M., Tarba, Y.S. and Raviv, A. (2013), "Mergers and Acquisitions in the High-tech Industry: A Literature Review", *International Journal of Organizational Analysis*, Vol. 21 No. 1, pp. 66-82.
  29. Rozen-Bakher, Z. (2018), "Comparison of Merger and Acquisition (M&A) Success in Horizontal, Vertical and Conglomerate M&As: Industry Sector vs. Services Sector", *The Service Industries Journal*, Vol. 38 Nos. 7-8, pp. 492-518.
  30. Seth, A., Song, K.P. and Pettit, R. (2000), "Synergy, Managerialism or Hubris: An Empirical Examination of Motives for Foreign Acquisitions of US Firms", *Journal of International Business Studies*, 31(3), pp. 387-405.
  31. Szücs, F. (2014), "M&A and R&D: Asymmetric Effects on Acquirers and Targets?", *Research Policy*, Vol. 43 No. 7, pp. 1264-1273.
  32. Vennet, R.V. (1996), "The Effect of Mergers and Acquisitions on the Efficiency and Profitability of EC Credit Institutions", *Journal of Banking & Finance*, 20, pp. 1531-1558.
  33. Wen, C.Y. and Z.X. Liu. (2011), "The Impact of Technological M&A on Innovative Performance of High-tech Listed Companies." *Science Research Management* 5, pp. 1-7.

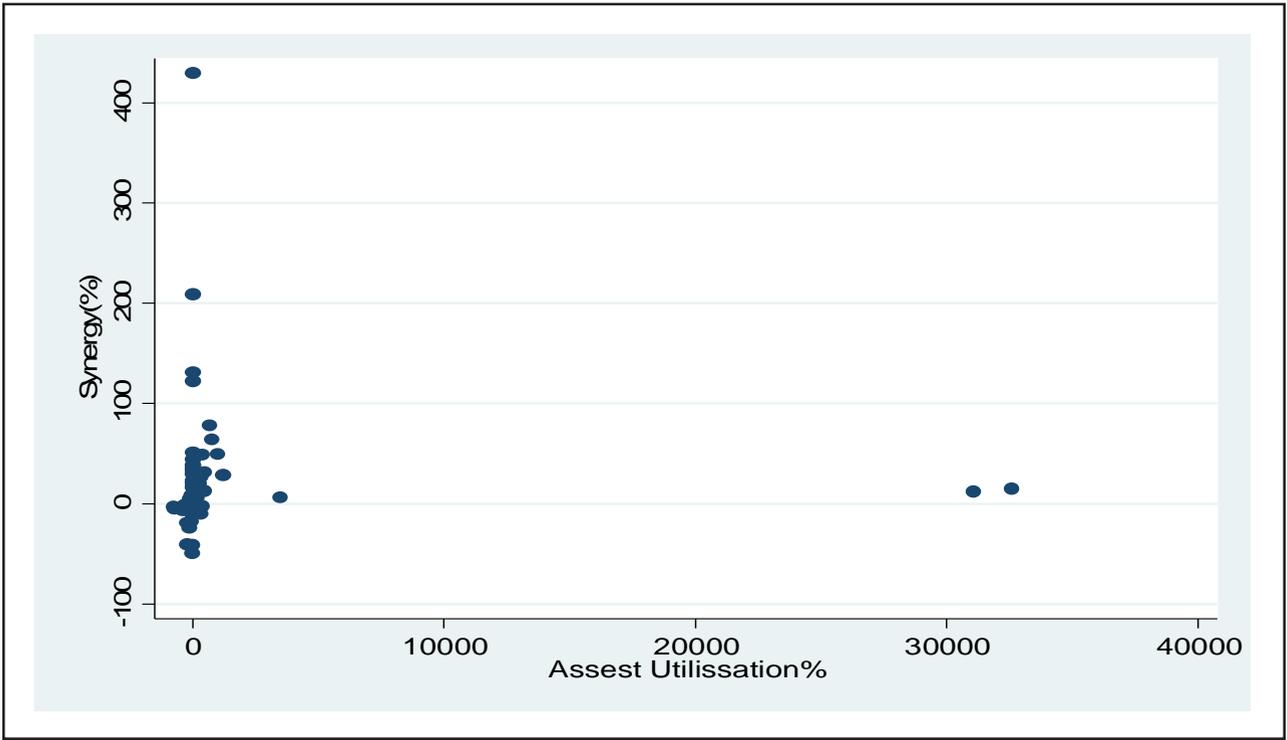
GRAPH 1  
SYNERGY SUCCESS (%) AND R&D (%)



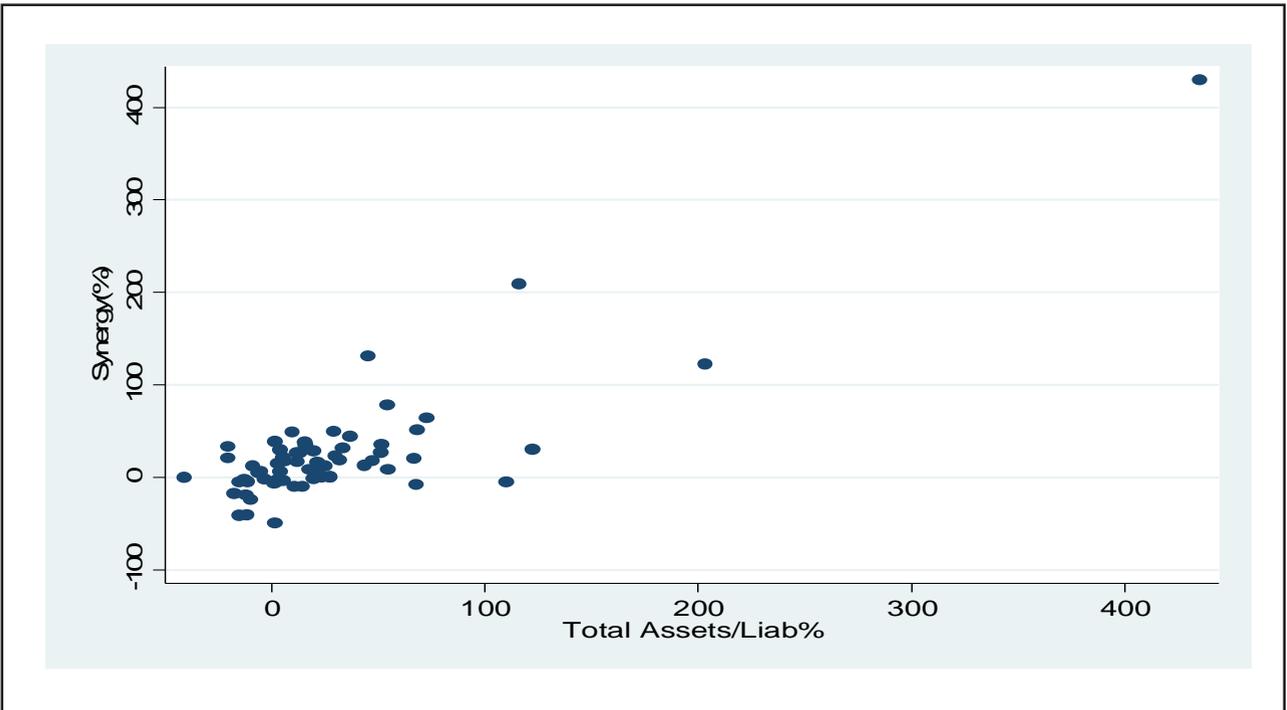
GRAPH 2  
SYNERGY SUCCESS (%) AND ROCE (%)



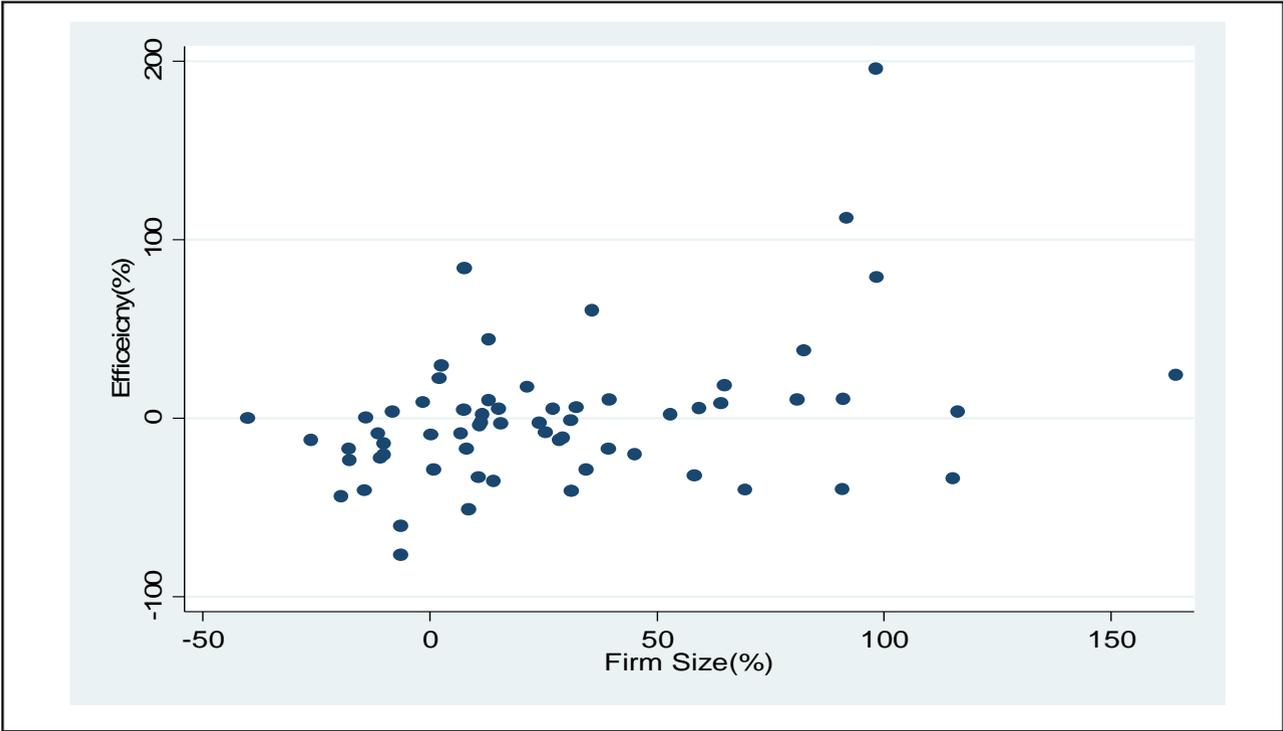
**GRAPH 3**  
**SYNERGY SUCCESS (%) AND ASSETS UTILIZATION (%)**



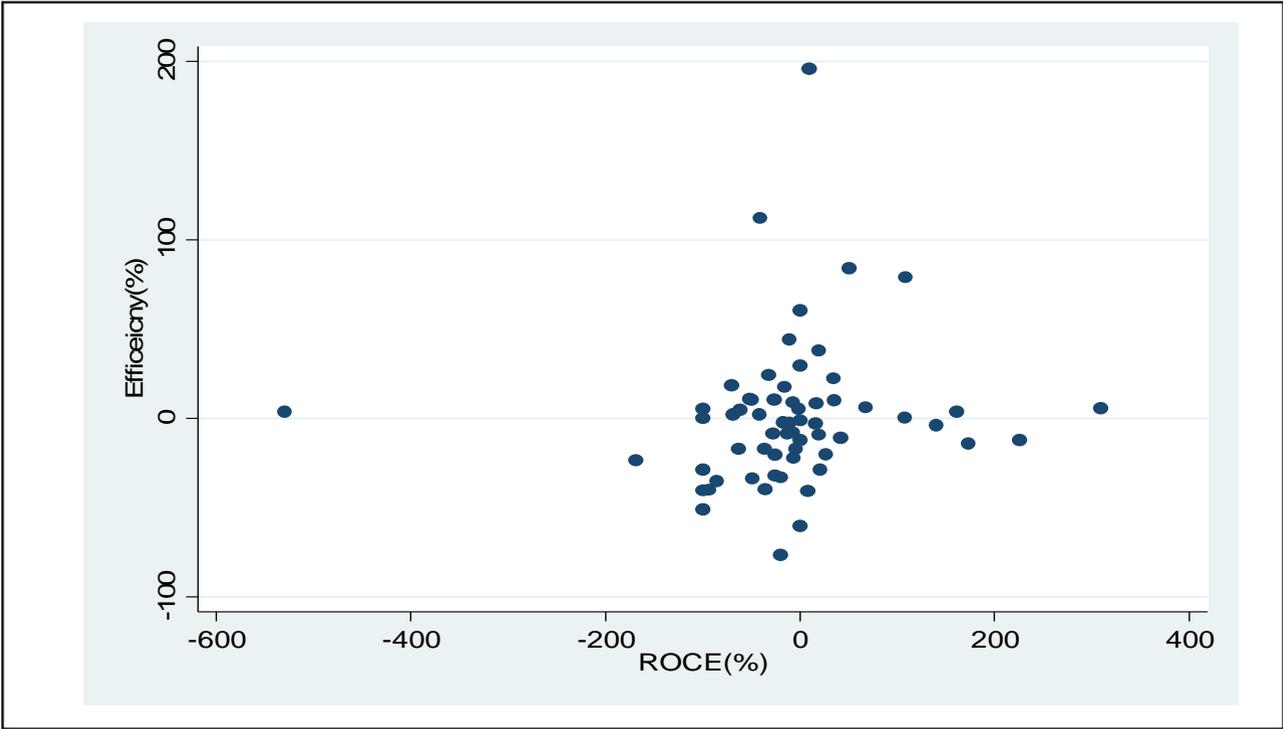
**GRAPH 4**  
**SYNERGY SUCCESS (%) AND TOTAL ASSET LIABILITIES (%)**



GRAPH 5  
EFFICIENCY GAINS (%) AND FIRM SIZE (%)



GRAPH 6  
EFFICIENCY GAINS (%) AND ROCE (%)



# A Comparative Analysis of Indian Biosimilar Pharma Market with the Global Market

## Current Status, Challenges and Future Perspective

*Gyan Prakash Ujalayan\**, *Shibu John\*\**, *Prerna Singh\*\*\**, and *Jwaad. A. Khan\*\*\*\**

Biosimilars are the subsequent adaptations of the original biologic medicines & drugs and these are manufactured with the purpose to provide remedial effects which are similar to original medicine. There is a favourable scenario for Indian biosimilar pharmaceutical market as many biologic medicines going off-patent in the recent period and the biopharmaceutical makers are directing their attention on the manufacturing of biosimilars, and it is expected to get bigger owing to the increase in the share of biopharmaceuticals both in the Indian and global pharmaceutical market. Biosimilar maker faces unusual problems in the development, clinical improvement, manufacturing, registration, product marketing, and ongoing competition which obstruct the entry of new players and restraining the growth of this market. Many challenges in the form of structural variability, immunogenicity, regulatory, etc. impede the way of the growth of biosimilars. They require separate marketing approval since they are not generic versions of biologics. Hence, they need full documentation on quality, safety and efficacy. The regulatory environment of pharmacy across the world is getting more stringent and impacting exports. Many other factors such as ambiguity about the market maturity level and significance of investing in this segment, discrepancy in regulatory rigor acted as constraints for biosimilar players in India to engage in global markets actively. This article aims to highlight the biosimilars market scenario in India and worldwide. In addition to that, it also discusses the significant challenges involved with biosimilars. It also contemplates some trends that reflect the bright future for biosimilars pharmaceutical market.

**Keywords:** Biosimilars; Biopharmaceutical Products, Biopharma Market; Pharma Export.

---

\* Research Scholar, Department of Health and Pharmaceutical Management, Jamia Hamdard, New Delhi.

\*\* Professor, Department of Healthcare and Pharmaceutical Management, Jamia Hamdard, New Delhi.

\*\*\* Research Scholar, Department of Health and Pharmaceutical Management, Jamia Hamdard, New Delhi.

\*\*\*\* Assistant Professor, Department of Health and Pharmaceutical Management, Jamia Hamdard, New Delhi.

### Introduction

THE pharmaceuticals market in India is very exclusive and has demonstrated very high potential in the last couple of eras. The sector has ranked tenth globally in terms of value and ranked third in volumes. The Indian pharmaceutical market will grow to US\$55 billion by 2020, with the potential to reach US\$70 billion in future growth scenario. India's ranking is among the 12 top biotech destinations in the world with the third position in the Asia Pacific region. From 2015, India's

biotechnology segment has been growing at a rate of 16.3 per cent, and it is one of the fastest growing sectors with a turnover of \$7 billion. Due to the increase in patent expiries for biologic drugs, there exists a valuable opportunity for the development of more productive biopharmaceutical industry in India. Also, the remarkable success of a few recent launches has demonstrated the true potential of patented products<sup>1</sup>. Indian biotech industry, budding at a faster speed, witnessed the growth of 57.14 per cent in FY16, in comparison with

the previous years. The total industry size stood at US\$11 billion by FY16 and is reached to US\$11.6 billion by FY17. Driven by several factors such as growing demand, rigorous research and development activities with healthy government initiative fast-paced growth of this sector is likely to continue<sup>2</sup>.

According to FDA, biosimilars are licensed by the FDA as they are identical to the reference product which is approved biologic product and shown to have no clinical difference from biologic reference product. The biosimilar guidelines of India are regularized with the EMA and WHO. India pharmaceutical companies are enhancing their manufacturing skills, and for clinical trials, they are working together with pharmaceutical companies worldwide. Also, due

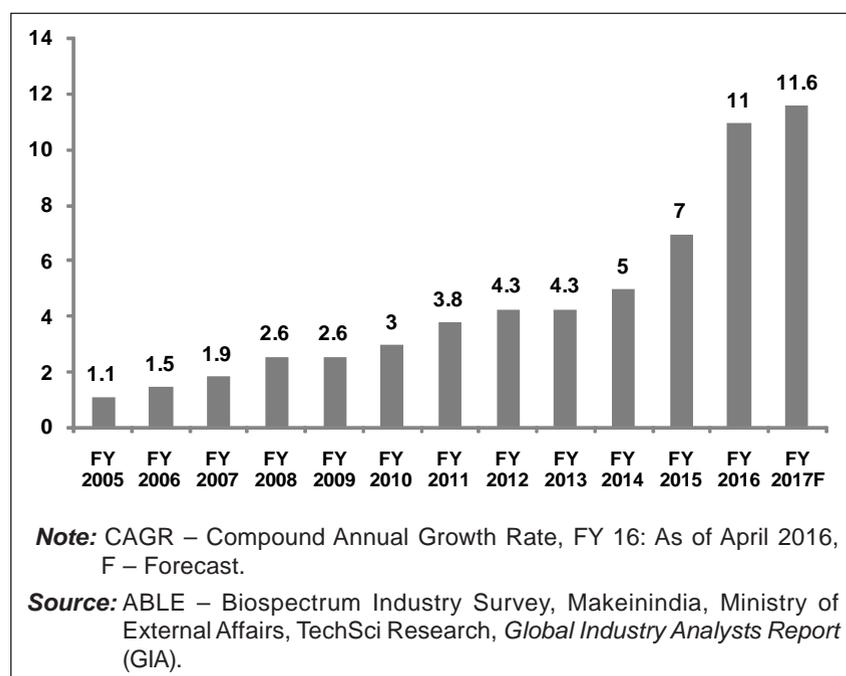
to the cost advantage of lower manufacturing cost, India has more benefit than its contesting nations which will further create a favorable scenario for the biopharmaceutical market.

The biosimilar market in India consists of various product segments, for instance; vaccines, hormones, insulin, erythropoietin, interferon-alpha, GCSF, and others. And out of these, insulin constitutes the significant portion of the biosimilar market, followed by erythropoietin and GCSF. With the suitability of biosimilars, their demand is higher in the domestic market, and these are consumed mainly as a part of remedial action and treatment of incessant illnesses such as rheumatoid joint pain, kidney problems, diabetes, tumours, CVDs, immune system illnesses, development hormone

inadequacy, haematological maladies, and irresistible infections, etc.<sup>3</sup>

By the year 2025, the global biopharmaceutical market is estimated to reach US\$46 billion. The first biosimilar was approved in the year 2006 in the European Union and since then the number of approved biosimilar drugs have reached more than 700, and many are in the process of manufacturing globally. There is immense potential for long term growth of biosimilars in established markets of Europe, Japan and the US and consumers can pay for the same. Although there are few challenges such as acceptance by both doctors and patients in terms of its safety, quality and effects on health and also precision in regulatory compliance for biosimilar growth in developed markets. Although, there is enormous capacity and high demand for biosimilar drugs in developing economies. The consumers have fewer resources to pay for highly-priced biosimilar medicines. Therefore, in the emerging economies, consumers have limited financial capacity and low affordability for biosimilars. Many studies have shown that the cost of biosimilar medicines is the main impediment for the use in emerging markets. The developing world has different healthcare structure in place, and their respective authorities are now focusing on reducing the cost of biosimilars and enhancing access to medicines for their populations. However, the approval for biosimilars and complying its regulatory procedures are a matter of concern for both developed and developing economies<sup>4</sup>.

**FIGURE 1**  
**GLOBAL PHARMA MARKET SIZE**



## Objectives and Research Methodology

The main objective of this paper is to analyze Indian biosimilar pharmaceutical market and its growth prospects. The paper talks about its current status, growth pattern, various challenges and its future perspective in terms of exports. The paper also focuses on strict regulatory requirements in developed and emerging markets which obstruct the entry of new participants and averting the growth of this market. This methodology involves extensive literature review from secondary databases reports and research publications on biopharmaceutical market like Export & Import Bank of India, IBEF, McKinsey and Company reports, etc.

## Indian Biosimilar Market

Biosimilars need to be comparable at the quality which includes head to head comparison for stability, characterization and specification, pre-clinical (PD studies in vitro and in vivo, toxicity and immunogenic studies) and clinical (single dose or multidose, efficacy, safety and immunogenicity data recording) levels to the reference biologic product. In India, the development of biosimilars cost around US\$10-20 million due to regulatory procedures for their approval. And biosimilar manufacturer faces many problems in the development, clinical improvement, manufacturing, registration and product marketing in contrast with generics drugs<sup>5</sup>.

Biosimilars will be expected to become a progressively vital part of Indian pharmaceutical ecosystem.

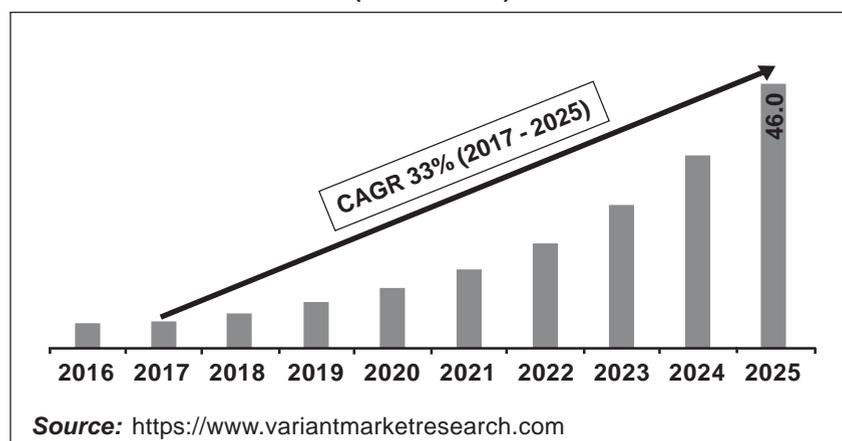
In the domestic market of India, there are above 20 biopharmaceutical companies which are actively working on biosimilars products development, and presently there are around 70 biosimilar products which are already approved in India. In current years, more than 50 biopharmaceutical products have been permitted for marketing in India which includes monoclonal antibodies, insulins, filgrastim, development hormones, interferons, proteins, streptokinase, etc. There are sixty plus biosimilars in the development pipeline which includes medications in the therapeutic areas such as oncology, immunology and diabetes with biosimilar makers showing specific interest in leading biologics with recent or pending patent expiry that includes Avastin, Humira, and Levemir. As many biologics are going off patent in the coming years and it is anticipated that there will be a rise in the share of biosimilars in the global biopharmaceutical market the Indian manufacturers are directing their concentration on more biosimilars production<sup>6</sup>.

## Biosimilars Market: Global Scenario

Globally, from 2017 to 2025, the biosimilars market is estimated to reach \$46.0 billion, which is growing at a CAGR of 33 per cent. The international biosimilar market has been segmented by geography and product class. By geography, it is segmented into Europe, Asia Pacific, North America and Rest of the world. Europe accounts for the largest share around 35 per cent of the global market, Asia Pacific accounts for 30 per cent which is also the leading market for biopharmaceuticals followed by North America which comprise of 27 per cent and the rest of the world is 8 per cent. The product section of biosimilars is classified into:

- Recombinant non-glycosylated proteins which are insulin, granulocyte colony-stimulating factor, interferons, development growth hormones.
- Recombinant glycosylated proteins such as monoclonal antibodies, erythropoietin, follitropin.

**FIGURE 2**  
GLOBAL BIOSIMILARS MARKET SIZE AND FORECAST, 2016 – 2025  
(US\$ BILLION)



(c) Recombinant peptides like glucagon and calcitonin.

The biosimilars markets in Europe have evolved to a great extent with a large area of single payors. Europe has been a pioneer in the biosimilar regulatory landscape and the European Medicines Agency corroborated a set of congruent rules and regulations that biosimilars manufacturers must adhere to evaluate and approve their biologics centrally. The centrally governing body makes a decision regarding approval and indications of new biologics. And the individual countries can postulate their own policies about price, purchase, utilization of biosimilars and the decisions about inter changeability are also left to countries.

The developed markets are more established, and they demonstrate mixed levels of biosimilars penetration. In Europe, there is an increasing demand for biosimilars, but its penetration varies across different European countries due to various factors such as level of awareness about biosimilars among doctors and pharmacists, different incentives, purchasing policies and distribution channels for these medicines. The incentive and purchasing policies for biosimilars are diverse across all European countries, which leads to exclusive procedures to access different markets. The penetration level of biosimilars, in conjunction with other factors, will regulate the level of competition and price erosion in established markets.

In Europe, the level of biosimilars acceptance varies from country to country. The countries named Finland, Poland, Bulgaria

and Denmark are witnessing more extensive penetration of biosimilars products than other countries such as the UK, France and Germany. Some trends regarding biosimilars products are also observed like UK has the highest share for GCSF, i.e. 98 per cent while only a 6 per cent share for Epoetin Alfa. Another trend observed is that Insulins and Follitropin Alfa biosimilars with the highest being 35 per cent have less market penetration in most countries in Europe.

Europe is projected to lead the global biosimilars market. North America is also projected to experience a substantial growth in the biosimilars market due to rising efforts from manufacturers to tap growth opportunities in the US and Canada. In March 2009, the US biosimilar regulatory pathway was established, and from then only the section has gained significant drive in the market which presents new challenges and opportunities. In March 2015, the US FDA approved the first biosimilar product named Zarxio (filgrastim-sndz). In Asia Pacific countries, low manufacturing cost of biosimilars, skilled labour force and less stringent regulatory procedures by the authorized regulatory bodies predicted to showcase high progress for biosimilar market. And countries such as India, Korea and China are likely to experience vital development in biopharmaceutical industry in recent era<sup>7</sup>.

### Exports of Indian Biosimilar Products

By 2020, India will become the sixth-largest market for pharmaceuticals, and it has firmly established itself in the global

biopharmaceutical market. Many of the Indian pharmaceutical companies are starting to move into the global biosimilars market. As per the report of Associated Chambers of Commerce of India's 2017, biosimilars represent a 30 per cent compound annual growth rate. They are worth \$2.2 billion out of the \$32 billion total Indian pharma market and are estimated to reach \$40 billion by the year 2030. This leads to growth in biosimilar pharmaceutical segment, and this will be supported by many biologics going off patent in the coming years. At present, there are several pharmaceutical companies reaching towards regulated markets. In India, there is an active pipeline of biologics segment with top players named as Intas Biologicals, Biocon, Dr. Reddy's Laboratories, Zydus Cadila, Reliance Life Sciences, Lupin Pharma, Wockhardt, etc.

Biosimilars present a very attractive opportunity for Indian biopharmaceutical industry as even during intense competition and price pressures it is growing and developing drugs beyond small-molecule generic drugs. The biosimilar industry in India is poised at the cusp of progress with a record number of domestic approvals, with active commitment in semi-regulated markets and emerging mark in regulated markets. This development is being driven by growing market maturity in Europe, the US and other countries, and it requires a forthcoming environment for smooth regulatory approvals and high unmet clinical need across markets. And there are numerous other factors such as the significance of investment in this segment, discrepancy in regulatory

rigour and insecurity about the market maturity levels have aided as constraints for Indian biosimilar players to engage in regulated markets actively<sup>8</sup>.

The major pharmaceutical firms worldwide are establishing partnerships with Indian pharma companies which reflects the growth of a promising market of biosimilars in India. The Roche swiss-based pharmaceutical firm move into an agreement with Emcure, which is an Indian firm to market the drug named Biceltis for cancer treatment. Another renowned pharmaceutical firm Mylan has established a partnership with Biocon, which is Bangalore based pharmaceutical firm. Both companies working together and have made important development by getting biosimilars approved in both developed markets of Europe and the US. In the year 2018, Biocon revenue growth is \$120 million, recorded 36 per cent from there biosimilars business. Also, in the same year partnership of firms, Biocon and Mylan in June produced a biosimilar drug approved by the US FDA named fulphila (trastuzumab) which is indicated to minimize febrile neutropenia while cancer patients go through chemotherapy, and it is the first biosimilar produced by an Indian pharmaceutical firm get approved in the US. Fulphila is currently under review in Australia and the EU<sup>9</sup>.

In the coming years, an increase in demand for biosimilars worldwide will drive the biopharmaceutical industry in India. As per the report by Crisil Research, from period 2015-2021, the pharma industry in India is

expected to grow at 12-14 per cent CAGR. There are various factors which improve the growth of the biopharmaceutical sector in India, which includes the introduction of new molecules by innovators, drugs going off-patent, upsurge in ageing population and increase in the number of chronic illnesses worldwide.

In the current years, with the arrival of private manufacturers in this particular biosimilar segment has changed the pharmaceutical industry landscape and enhanced the focus on this segment. Due to low drug development cost, India has an advantage in manufacturing biosimilar drugs than other competing countries. Also, biopharmaceutical firms of India are enhancing their manufacturing process, quality standards, and collaborating with multinational companies for clinical trials which will further robust the growth of this market<sup>10</sup>.

### **Challenges Faced by the Biosimilar Pharmaceutical Industry**

The regulatory environment of pharmacy across the world is getting more stringent. To compete in the global market, the Indian pharmaceutical industry needs a robust regulatory set-up. But the sector is currently grappling with many issues like delays in clinical trials approval, pharmaceutical pricing policy, uniform code for sales and marketing practices, compulsory licensing, manufacturing quality, regularity uncertainty, reluctance in prescribing, complexities in production and competition all of which need immediate attention.

*Clinical Trials:* These are the gold standard processes which determine the safety and effectiveness of these drugs and must be proved before regulatory approval. India is becoming a knowledge hub for pharmacy, research and development, and clinical trials. These clinical trials are required for the growth of the pharmaceutical industry to foster cost-effective treatment for different ailments such as diarrhoea, tuberculosis, malaria, meningitis, etc. to benefit from opportunities provided by biosimilar drugs. And regulatory delays in the clinical trials are severely hampering this possibility. It has disturbed the innovation curve as well as the growth of the clinical trial industry. Furthermore, issues such as ineffective regulatory oversight, need for safeguards for informed consent for vulnerable populations and compensation guidelines for patients for trial-related deaths have emerged as significant concerns. As a result, because of the mentioned limitations during clinical trials, our country is missing out on many opportunities.

*National Pharmaceutical Pricing Policy:* The control on pharmaceutical drugs pricing is seen worldwide. The Indian government has developed the capacity of the Drugs Price Control Order (DPCO) by this policy to include all the drugs in the National List of Essential Medicines (NLEM). They have changed the formula from a cost-based method to a market-based approach to reach at the maximum price limit. By this policy, the pharmaceutical firms are feeling the effects of the price controls on their top line drugs which will have a negative effect in short course. However, the negative

impact of this policy can be abolished in the long term with upgraded plans and policies. There is one issue which has severely impacted the pharmaceutical industry is the timeline for the implementation of DPCO. The pharmaceutical industry felt that the government did not provide sufficient time for implementing the new packaging and labelling with the revised prices. As there is no clarity regarding location, when and where packaging and labelling exercises can be executed. Due to this, some pharma companies go to court to get an extension while others who couldn't go in time are still suffering. This problem can be avoided through the right consultation and by giving adequate time to the firms for the implementation of the revised prices.

*Uniform Code on Sales and Marketing:* The Department of Pharma has given guidelines on uniform code on sales and marketing practices which apply to all pharmaceutical firms to streamline marketing efforts and prevent corruption. But the Department of Pharma guidelines are diverse from the MCI guidelines on sales and marketing practices and the tax authorities use the Central Board of Direct Taxes (CBDT) circular based on MCI guidelines to make a decision on permitted sales and marketing expenses. So, due to different benchmarks between the guidelines of Department of Pharma and MCI. There is an increased demand for clarity, both from the perspective of the tax authorities and the pharmaceutical industry.

*Compulsory Licensing:* The pharmaceutical industry is already

following strict rules and regulations on manufacturing and quality practices for drug development both in domestic and international markets. The blanket practice of compulsory licensing will destabilize both the Indian as well as foreign biopharmaceutical companies. There should be an equilibrium between the need for the affordability of drugs and intellectual property protection. The intention of the government to ensure the availability of patented medicines at a reasonable price is noble, but there are other ways of achieving the same goal.

*Manufacturing Quality:* The Indian pharmaceutical industry is efficient, which is making affordable medicines not only for the Indian market but also exporting these drugs to the world. The increasing confidence of foreign markets for the drugs manufactured in India is vital. For that, the authorities need to set the quality standards as par with the global standards through appropriate legislation, and they must ensure that these standards are effectively enforced.

During last year, the pharmaceutical export from India to the US increased to 32 per cent and India has become the biggest supplier of medicines to the US. Now Indian pharma firms are drawing more massive FDA scrutiny for manufacturing and quality compliance. And to continue export with global markets, India have to boost its quality and manufacture compliance programmes. By focusing on the above challenges in a holistic manner, it will strengthen the Indian pharmaceutical industry, which

comprises as a substantial segment of the Indian economy.

*Regulatory Uncertainty:* In the year 2010, the Biosimilars Act also known as Biologics Price Competition and Innovation Act was passed to set a standard for the approval process for biosimilar medicines. The act defined the pathway for approval and the timeline for biosimilars. It specified the task of applications to be given to the FDA. As FDA had given six guidance documents to explain provisions of the Biosimilars Act as it strengthened the standards for some restrictions and added new restrictions.

*Reluctance in Prescribing:* Biosimilars are manufactured using a living system, or genetics, which significantly affects the safety and efficacy of the therapeutic molecules. In comparison to generic drugs, even a minute change in their manufacturing process can alter the final outcome drastically. Therefore, even minimum variations in the manufacture of biosimilar products can affect the efficiency and efficacy of therapeutic molecules to a very great extent. Many doctors feel reluctant to prescribe biosimilars until these therapeutic molecules show some important clinical data which poses a major challenge for biosimilars growth in the market.

*Complexities in Production:* The cost indulges in developing biosimilar drug is higher than generic drugs. Also, biosimilars production is a complex process which involves exact copying the structure of the original biologic. Thus, the biosimilar manufacturing incurs a high cost, time and risk in comparison to generic drugs. And

this production cost is passed on to the consumers in terms of higher prices.

**Competition:** Biosimilar products are expected to involve mainly in brand competition with their reference biologic products. In contrast to generic drugs which are heavily discounted, discounts on biosimilars drugs can be aligned by rebates and service contracts for branded biologics. In general, it takes longer to convince all stakeholders about the benefits of biosimilars as it involves long term biological treatments.

Thus, biopharmaceutical companies will have to invent new strategies to mitigate the risk arising from the above-discussed challenges for sustainable growth of the biosimilars market<sup>11</sup>.

## Conclusion: Future Perspective

The global biosimilars pharmaceutical market development is driven by various factors such as rising pressure to diminish healthcare expenditure, increase in incidence rate of multiple chronic diseases, optimistic results of numerous clinical trials and upsurging biosimilar demand for diverse medicinal treatments for instance in rheumatoid arthritis, blood disorders and other ailments, upsurge in number of drugs going off-patent which leads to rise in biosimilar drugs demand. However, challenges such as manufacturing complexities and costs, stringent regulatory requirements in developed and developing countries and novel strategies by biologic drug manufacturers hinder the entry of new players and

preventing the development of this market. In the most optimistic scenario, it is estimated that by the year 2030, the biosimilar pharmaceutical market worldwide will be of \$240 billion and biosimilars market in India will reach \$40 billion. It is essential to foster the vibrant industry landscape and supporting the biosimilar pharmaceutical industry in real value realization. Now it becomes pertinent to provide all participants with all the information and accurate inventory to contest in commercial encounters at the stage of market entrance and to access both in domestic as well as international markets.

## NOTES

<sup>1</sup> India Pharma 2020: Propelling Access and Acceptance, Realizing True Potential, McKinsey & Company. Retrieved from: <https://www.mckinsey.com>

<sup>2</sup> Biotechnology Industry in India - Market Share, Reports, Growth (2017, July). Retrieved from: <https://www.ibef.org>

<sup>3</sup> Biosimilar and Interchangeable Products - FDA (2017, October 20). Retrieved from: <https://www.fda.gov/drugs/biosimilars/biosimilar-and-interchangeable-products>

<sup>4</sup> Indian Pharmaceutical Industry: Challenges and Prospects. Export-Import Bank of India, (2016, August). Retrieved from: <https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/.../55file.pdf>

<sup>5</sup> Rushvi P. *et al.* 2016, Biosimilars: An Emerging Market Opportunities in India, *Pharmaceut Reg Affairs* 5: 165. DOI:10.4172/2167-7689.

<sup>6</sup> Study on the Indian Pharmaceutical Industry.<sup>1</sup> Export-Import Bank of India (2015, March). Retrieved from: <https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication.../55file.pdf>

<sup>7</sup> Biosimilars Market Global Scenario, Market Size, Outlook and Trend (2018, April).<sup>2</sup> Retrieved from: <https://www.variantmarketresearch.com/report-categories/.../biosimilars-market>

<sup>8</sup> Expanding from Generics to Biosimilars in India (2018, September 4). Retrieved from: <https://www.pharmaceutical-technology.com>

<sup>9</sup> Indian Biosimilar Market to be Worth \$40 billion by 2030 (2018, November 23). Retrieved from: <https://www.corecommunique.com>

<sup>10</sup> Indian Pharmaceuticals Industry Analysis (2017, April). Retrieved from: <https://www.ibef.org>

<sup>11</sup> Indian Pharmaceutical Industry: Challenges and Prospects, Export-Import Bank of India (2016, August). Retrieved from: <https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/.../55file.pdf>

<sup>1</sup> Figure 1: <https://www.ibef.org>

<sup>2</sup> Figure 2: Source-<https://www.variantmarketresearch.com>



**Declaration of Conflicting Interest:** The authors as named Gyan Prakash Ujalayan, Shibu John, Prerna Singh, Jwaad Akhtar Khan declares that there is no conflict of interest.

# A New Era of Globalization

*Samridhi Bimal\**

The new era of globalization heralded by the onset of the fourth industrial revolution is characterized by digital integration of economies. The rising digitalization offers tremendous opportunities for India. As per a recent study by All India Management Association and the Hinrich Foundation (2019), digital trade in India has the potential of reaching US\$512 billion in 2030 (an increase of 14 times from current value of about US\$35 bn.) if cross-border data flows and storage are fully facilitated. The Government of India is committed to digitally transform the country and has launched several initiatives in this direction. In this regard, the objective of this article is to understand the concept of digital-trade, analyze its importance for India and provide an overview of the barriers to digital trade. The article concludes by recommending a way forward for achieving the vision of a 'Digital India'.

**Keywords:** Digital Trade, Digital India, Information Communication & Technology.

THE world economy is facing a new era of globalization, characterized by digital integration of economies. The digital transformation of trade and cross-border production has substantially reduced the costs of international trade, facilitated the co-ordination of global value chains, helped diffuse knowledge, ideas and technologies and connected a number of producers and consumers globally. This has changed the manner in which enterprises organize international trade - what they sell and to whom. This has led to a number of complex international transactions involving combinations of trade in goods, services and data crossing different borders.

As per a recent study by All India Management Association

---

\*Fellow, Indian Council for Research on International Economic Relations (ICRIER), New Delhi.

and the Hinrich Foundation (2019), digital trade in India has the potential of reaching US\$512 billion in 2030 (an increase of 14 times from current value of about US\$35 bn.) if cross-border data flows and storage are fully facilitated. The objective of this article is to understand what is digital-trade, analyze its importance for India and provide an overview of the barriers to digital trade. The article concludes by the way forward for achieving a 'Digital India'.

## What is Digital Trade?

While there is no single recognized and accepted definition of digital trade, there is a developing consensus that it covers "digitally-enabled transactions of trade in goods and services that can either be digitally or physically delivered, and that involve consumers, firms, and governments" (OECD, 2019). Put simply, while all kinds of digital trade are facilitated by digital

technologies, not all digital trade is digitally delivered. For instance, digital trade includes digitally delivered software, e-books, data or database services, and digitally enabled but physically delivered goods and services, such as a purchase of a good on an online marketplace or a flight booking made through a matching service.

## Importance of Digital Trade for India

A recent study by McKinsey (2019) finds that India is the second fastest growing digital economy in the world (first being Indonesia). The public sector has been a strong catalyst for India's digitization. The Indian government's 'Aadhaar' programme (the national biometric digital programme) has a big role to play in this. The Goods and Services Tax Network which was established in 2013 and brings all transactions onto one digital platform has also been a good incentive for businesses to digitize

their operations. On the private sector front, innovation and new schemes has enabled access to internet to millions of consumers. The Reliance Jio's plan of bundling virtually free smartphones with internet subscriptions has spurred innovation and competition across this sector. Overall, mobile data costs have come down by 95 per cent since 2013 (McKinsey, 2019). These are just few examples which make the case clear-India's digital economy is rapidly evolving. I discuss few fundamental indicators to build this case stronger:

- **Number of Internet Users**

In 2015, developing and transition economies accounted for 70 per cent of the world's internet users. The largest number of internet users were in

India and China (Figure 1). Out of top ten internet users, only four were developed economies. The annual growth rates of internet use in India was 4.6 per cent from 2012 to 2015. In fact, nearly 24 per cent of the 750 million people that went online for the first time between 2012 and 2015 were from India (UNCTAD, 2017).

It is also important to point out here that despite the advancement India has made in terms of the number of internet users, it still lags behind several other developing countries in terms of some key ICT development indicators. India ranks 134 out of 176 countries in its ICT development index. It lags behind several Asian developing countries like Cambodia, Indonesia, Malaysia, Philippines, Singapore, Sri

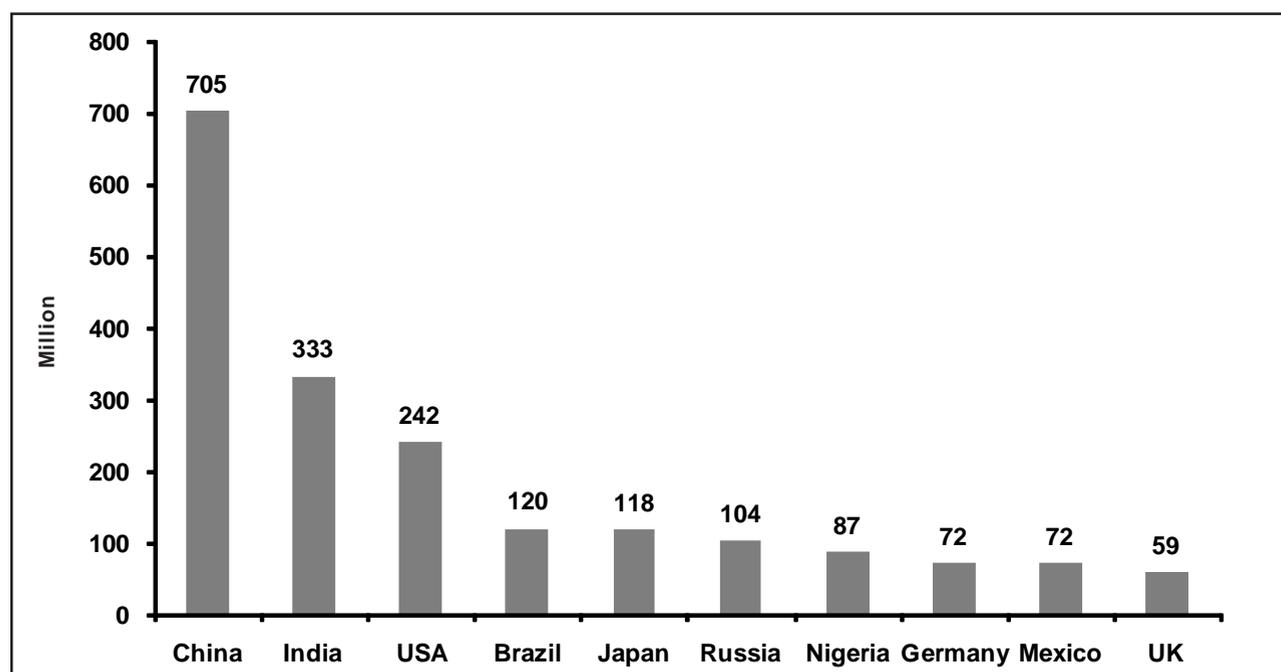
Lanka, Thailand, and Vietnam. India ranks lower in terms of 3G coverage; fixed broadband subscription per 100 inhabitants; percentage of households with internet access; active mobile broadband subscription per 100 inhabitants, and international internet bandwidth per internet user from most of these countries (Banga, 2019).

- **Importance of ICT Sector for India**

Services are a major part of the Indian economy, contributing to more than half of the country's gross-value added, attracting more than 15 per cent of cumulative foreign direct investment and employing large share of the work force. Today, the services sector in India is one of the fastest services sectors in

**FIGURE 1**

**TOP 10 ECONOMIES BY NUMBER OF INTERNET USERS IN 2015**



Source: UNCTAD (2017).

the world. This can be attributed to India's natural comparative advantage as a global services provider owing to its vast English-speaking population, low costs of labour and a market feedback mechanism that has successfully encouraged graduates to specialize in industries (the ones enjoying advent of global communications technology) having good prospects for the future (Bajpai *et al.*, 2018).

Within the services sector, it is the information and communications technology (ICT) industry which is at the core of the digital trade taking place in India. The ICT industry is usually the combination of Information Technology (IT) which focuses on computers and related devices and digital telecommunication, which includes mobile phones, internet and other digital networks.

India is among the top 10 economies with the largest ICT services production in the world. The value added of ICT services for India is estimated to have been about US\$92 billion in 2015. Given India's linguistic and engineering skills, it has been a pioneer in ICT exports (particularly exports of software services) since the 1990s. Taking its early bird advantage, India has retained a comparatively large market presence in the software segment of IT industry (Saith and Vijayabaskar, 2005). The expansion of ICT services in India's trade is also an indication of how much the digital economy has grown.

Between 2014 and 2016, India exported US\$6566 million worth of telecommunications and computer services. In fact, trade in ICT-enabled services is also growing rapidly. As per DGCIS (2018), India exported a total of US\$103 billion worth ICT-enabled services (except insurance) in 2016-17.

The performance of India's ICT sector is itself a yardstick of the potential in further expanding the digital trade in India.

#### • Barriers to Digital Trade

In order to facilitate digital trade transactions, it is important to remove barriers to trade in services. This needs to be a focus area in order to obtain market openness in the new area of digitalism.

The OECD's Digital Services Trade Restrictiveness Index (DSTRI) identifies "catalogues and quantifies cross-cutting barriers that affect trade in digitally enabled services" across 44 countries for the time period 2014-18. This index shows that India is among the top five most digitally restrictive countries (the other four being China, Russia, Indonesia and Vietnam). The restrictiveness is high on account of restrictive policies in public procurement and settings of standards, usage of several trade defence measures on digital products and high tariffs on import of digital goods. There are also regulatory and burdensome barriers in the field of taxation, foreign investment, and

intellectual property rights (Ferracane *et al.*, 2018).

However, on a positive front, India remains relatively open in its data policies. This openness has created a framework enabling India to become a major exporter of ICT services.

#### Towards a 'Digital India'

The Indian government approved the programme on 'Digital India' in August 2014 with the vision of transforming the country into a digitally empowered society and knowledgeable economy. A substantial progress has been made on this front since then. India became the second largest market of smartphones in the world. The number of registered users in the Aadhaar digital identity programme has more than doubled. There has been impressive growth in the e-commerce industry. There has been increase in the use of digital payments.

What we need in India is a new *digital industrial policy* that develops an enabling legal and regulatory framework to support and facilitate digital interactions (Singh, 2018). One aspect of digital industrial policy should be to build a supportive environment around tech and digital start-ups that have begun to emerge in India. The programme 'Startup India' is a right step in this direction. The second aspect of the digital industrial policy should be to focus on building public digital and data infrastructures, which should go beyond connectivity/access, and the IT/software

layers. There are different types of infrastructure the government needs to focus on *inter alia*, infrastructure that enables safe and secure digital transactions, personal safe data architectures and core sectoral data for different sectors. Until and unless the requisite digital and data

infrastructures are in place, digitalization cannot exist. A third aspect is data regulation, which is also an important regulatory issue right. There has to be recognition of the importance of privacy rights and economic value/ownership aspects of data, and their interplay. Lastly, at the

centre of India's digital revolution lies the investment that the country has to make in digital infrastructure. The digital industrial policy has to be all inclusive so that it successfully heralds a significant digital transformation in India.

## REFERENCES

1. All India Management Association and Hinrich Foundation (2019), "The Data Opportunity: The Promise of Digital Trade for India".
2. Bajpai, N., Biberman, J. and Ye, Y.Y. (2018), "National ICT-Driven Development Policy Comparing Approaches in India and China", *ICT India Working Paper No. 2*. Center for Sustainable Development, Earth Institute, Columbia University.
3. Banga, R. (2019), "Is India Digitally Prepared for International Trade?", *Economic and Political Weekly*, 54.
4. DGCIS (2018), "India's Export of ICT-enabled Services", *An all-India Survey 2016-17*, Ministry of Commerce and Industry, Government of India.
5. Ferracane, M.F., Lee-Makiyama, H. and Van Der Marel, E. (2018), "Digital Trade Restrictiveness Index", *European Centre for International Political Economy*, Brussels: ECIPE.
6. McKinsey (2019), "Digital India: Technology To Transform A Connected Nation". Available at <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20India%20Technology%20to%20transform%20a%20connected%20nation/Digital-India-technology-to-transform-a-connected-nation-Full-report.ashx>
7. OECD (2019), "The Impact of Digitalization on Trade". Available at <https://www.oecd.org/trade/topics/digital-trade/>
8. Saith, A. and Vijayabaskar, M. eds. (2005), "ICTs and Indian Economic Development: Economy, Work, Regulation". SAGE Publications India.
9. Singh (2018), "Digital Industrialization in Developing Countries – A Review of the Business and Policy Landscape", draft prepared for Commonwealth Secretariat. UNCTAD.
10. UNCTAD (2017), *Information Economy Report, Digitalization, Trade and Development*. Geneva, Switzerland.



# Capital Structure Adjustments for Mergers and Acquisitions: A Review of Literature

Vrinda Rawal\*

Firms make adjustments in capital structure before and after mergers and acquisitions depending on their current and optimum level of leverage, and this may affect the post deal performance significantly. This paper is an attempt to study the capital structure adjustments in context with mergers and acquisitions where deviations from target capital structure and its implications have been closely considered. It examines how changes in capital structure affects the M&A transactions with respect to its pricing, financing and valuation and observes the significant role of debt and equity while participating in mergers and acquisitions.

**Keywords:** Acquisition and Mergers, Capital Structure, Debt, Optimum, Target.

## Capital Structure and M&A

The capital structure changes and adjustments affects investment decisions concerning mergers and acquisitions as evidenced in several past studies [Kim, E.H., and McConnell, J.J. (1977)]; Ghosh, A., and Jain, P.C. (2000); Uysal, V.B. (2011); Ong, T.S., and Phing Phing, N. (2012); Agliardi, E. *et al.* (2016). Mergers and acquisitions are strategic investments for inorganic growth in an organization. It restructures and alters the components of the balance sheet to bring about a positive change in the overall performance. The change in asset mix will consequently alter the borrowing capacity of the firm, either through excess borrowing capacity of the target firm or combined debt capacity of the merged firm. If the acquirer's debt capacity is increased, a financial gain can be obtained from the respective investment (Lewellen, 1971; Levy &

Sarnat, 1970; and Kim & Mc Connell, 1977). Firms also tend to have target debt ratio which is maintained when firms trade-off the tax benefits of using debt against the financial cost of distress involved in acquiring more debt, as hypothesized by static trade-off theory (Modigliani and Miller, 1963). There are empirical studies by Ghosh and Jain, 2000; Harford *et al.*, 2009; Uysal 2011 that examines the impact of deviations in these target capital structure, either prior to or after the transaction of merger and acquisitions, on the financing and payment method. The over-leveraged firms approach towards target capital structure by issuing equity, especially when they are more likely to acquire, as there is a negative association between leverage deficit<sup>1</sup> and likelihood of

acquisition (Uysal, 2011). The financing method adopted by the overleveraged firms also contribute to the reason of reducing the leverage deficit prior to acquisition, as such an acquirer is less likely to pay using cash and take more debt. DeAngelo *et al.* (2017) also showed how reducing firm's current leverage for higher financial flexibility provides an opportunity to borrow more in the future.

Inconsistent with the predictions of static trade-off theory, Fischer, Heinkel, and Zechner, (1989) finds that there is a negative association between profitability and debt levels, where a more profitable firm will keep a low debt ratio and allow fluctuations from target levels, if the cost of adjusting the debt ratio to target levels is higher than having a suboptimal capital structure. This is the dynamic trade-off theory of capital structure and is also supported by the pecking order theory which predicts firm's preference for internal finance over external, hence more profitable firms are likely to issue less debt. Shyam-

<sup>1</sup> Leverage deficit is actual debt ratio minus target debt ratio as defined by Uysal (2011). This is similar to leverage deviation given by Kayhan and Titman (2007) as the difference between actual debt ratio and its predicted debt ratio.

\* Research Scholar, Indian Institute of Foreign Trade, New Delhi.

Sunder and Myers (1999) further explains that external financing is resorted due to the lack of internal finances, and not because the firm wants to attain target levels.

### Capital Structure Adjustments Post M&A

There is also a need to understand how these changes in capital structure are adjusted after the acquisition is undertaken. Firms are inclined to increase their financial leverage significantly after the merger largely as a result of increased debt capacity of the combined firm (Ghosh and Jain, 2000). Harford *et al.*, (2009) supported that post acquisition increase in leverage is more likely when the target debt ratio of the combined firm is increased<sup>2</sup>. It also evidences that overleveraged bidder firms attempt to rebalance their capital structure close to their target leverage in the years following the cash financed acquisitions.

The leverage levels of the acquirer and target firm prior to acquisition and the way they choose to pay affects the capital structure of the combined firm. The cost and benefits of deviating from target capital structure differ for overleveraged and underleveraged acquirers (Korteweg, 2010) and therefore firms value increase in debt capacity differently. Overleveraged firms have a high possibility for cost of financial distress, while underleveraged

firms give up on the tax benefits associated with more debt and have less concerns for financial cost of distress (Faulkender, Flannery, Hankins, and Smith, 2012). This means that an overleveraged firm would be ready to pay a higher premium on the acquisition for an increased debt capacity or the target debt ratio of the combined firm. While the incentive for underleveraged firms to pay higher premium as evidenced by Ang, J.S., Daher, M.M., and Ismail, A.K. (2019) is to engage in market timing and offer overvalued stocks for the acquisition. They found a positive and significant relationship between acquisition premium and increase in debt capacity after taking into consideration the post merger change in leverage and target leverage in case of overleveraged firms and a similar relationship propounded between acquisition premium and stock overvaluation for underleveraged firms who would take benefit of the rather short and uncertain market timing. This underlines the impact of capital structure changes in making the strategic decisions of mergers and acquisitions on how it affects the pricing and valuation of the deals.

Further, to assess the announcement effect of an acquisition with such a premium and how did the investors respond at the apparent synergies that the acquisition presupposes, Ang, J.S. *et al.*, (2019) measured the market return at the time of announcement and also long-term post acquisition returns. They found that there are no significant announcement returns which means at the time of announcement, the market's

estimated benefit from the increased debt capacity will either offset the amount of premium paid to attain that, or the market is not fully aware of the synergy gains. However, in the long-run, both overleveraged and underleveraged firms gained, thus accepting the benefits of synergy post acquisition.

### Credit Rating and Acquisition Premium

Some studies have also shown the interdependence between credit rating and acquisition premium paid. The presence of credit rating may mitigate the information asymmetry, making it easier for firms to access credit market for obtaining finances and for acquirers' to price target firms (Koziol and Lawrence, 2010; Campello and Chen, 2010). The increased debt capacity for which the overleveraged acquirers are willing to pay higher premiums, is possibly due to a poor access to debt market. Thus, an access to the debt market is also one of the contributors in valuing targets at the time of mergers and acquisitions as it significantly affects the premium paid (Jory, S.R. *et al.*, 2016). The premium paid is lower for deals where the target is a rated firm as against non rated firms, and subsequently the rated firms showed a superior performance than non rated firms post the M&A transaction. Although, Ang, J.S. *et al.*, (2019) found that credit rating does not affect the value that acquirers, both overleveraged or underleveraged, place on increase of debt capacity and willingly pay a higher premium, as the performance of market returns remained superior

<sup>2</sup> Harford *et al.* (2009) finds that there is more than two-thirds of the change in the combined firm's target leverage while financing large acquisitions.

for over-leveraged firms with increased debt capacity regardless of the credit rating of the firms. It means an access to debt market, may not have any role to play in valuing increased debt capacity. Thus, an ability to access the market will not necessarily mean the creation of debt capacity.

### Leveraging, Opportunities of Growth and Diversification Effects

Capital structure changes can also lead to the growth opportunities around mergers and acquisitions with financial and operational synergies. The literature has shown conflicting results on the relationship between leverage and growth opportunities. Rajan and Zingales, (1995), Hovakimian *et al.*, (2001), Hovakimian *et al.*, (2004), and Barclay *et al.*, (2006) argue that increasing growth opportunities tend to increase the underinvestment cost and thus creates a negative relationship between leverage and growth options. However, Lang *et al.*, (1996), Fama & French, (2002), Frank & Goyal, (2009), Chen & Zhao, (2006) and Agliardi, E. *et al.*, (2016) show a positive relationship between growth opportunities and leverage. The increase in leverage leads to high growth options, particularly when growth is significantly large there exist a U-shaped relationship between leverage and growth as theoretically evidence by Hackbarth and Mauer (2012), which was further verified by Agliardi, E. *et al.*, (2016) theoretically and empirically that changes in leverage before and after the merger and growth has a U-shaped relationship.

The diversification effect of mergers found in low correlation of cash flows leads to higher merger gains and is related with adjustments in leverage by reducing leverage before the merger and increasing it after the merger. Agliardi, E. *et al.*, (2016) also finds inconsistency with the co-insurance effect where low correlation in cash flows of merged firms gives debt holders an edge over equity holders, and instead showed a positive relationship between financial synergies and gains to shareholders. It suggested the equity holders find mergers gain where there is increased debt capacity since there is a higher possibility of financing the merger through debt, and thus shows a positive association between growth options and debt financing for mergers. It can be concluded that diversification and growth opportunities in mergers helps in determining the financing mode and required adjustments in capital structure.

### Scope for Further Research

This paper attempted to study the literature for changes in leverage around mergers and acquisitions and found varied effects of these adjustments in context with pricing, valuing, and financing decisions of the transaction. In a world full of financial frictions, we can not ignore the impacts of capital structure, especially on the financial and operational synergies of mergers and acquisitions. Ang, J.S. *et al.* 2019 evidenced how firms value their debt capacity in the event on mergers and acquisition

and it can be further studied that how acquisition premium and debt capacity are related, how credit rating which provides a higher access to the debt market will affect the M&A deal and its valuation, and how the growth opportunities are associated with changes in leverage level of the acquirer. This review provides an insight over the role of capital structure in and around acquisitions and opens the door for an in depth study on the identified variables to provide better ways of making strategic decisions concerning mergers and acquisitions.

### REFERENCES

1. Agliardi, E., Amel-Zadeh, A., and Koussis, N. (2016), Leverage Changes and Growth Options in Mergers and Acquisitions, *Journal of Empirical Finance*, 37, pp. 37-58.
2. Ang, J.S., Daher, M.M., and Ismail, A.K. (2019), How Do Firms Value Debt Capacity? Evidence from Mergers and Acquisitions, *Journal of Banking & Finance*, 98, pp. 95-107.
3. Barclay, M.J., Smith, Jr, C.W., and Morellec, E. (2006), On the Debt Capacity of Growth Options, *The Journal of Business*, 79(1), pp. 37-60.
4. Campello, M., and Chen, L. (2010), Are Financial Constraints Priced? Evidence from Firm Fundamentals and Stock Returns, *Journal of Money, Credit and Banking*, 42(6), pp. 1185-1198.
5. Chen, L., and Zhao, X. (2006), On the Relation Between the Market-to-Book Ratio, Growth

- Opportunity, and Leverage Ratio, *Finance Research Letters*, 3(4), pp. 253-266.
6. DeAngelo, H., Gonçalves, A.S., and Stulz, R.M. (2018), Corporate Deleveraging and Financial Flexibility, *The Review of Financial Studies*, 31(8), pp. 3122-3174.
  7. Fama, E.F., and French, K.R. (2002), Testing Trade-off and Pecking Order Predictions about Dividends and Debt, *The Review of Financial Studies*, 15(1), pp. 1-33.
  8. Faulkender, M., Flannery, M.J., Hankins, K.W., and Smith, J.M. (2012), Cash Flows and Leverage Adjustments, *Journal of Financial Economics*, 103(3), pp. 632-646.
  9. Fischer, E.O., Heinkel, R., and Zechner, J. (1989), Dynamic Capital Structure Choice: Theory and Tests, *The Journal of Finance*, 44(1), pp. 19-40.
  10. Frank, M.Z., and Goyal, V.K. (2009), Capital Structure Decisions: Which Factors are Reliably Important?, *Financial Management*, 38(1), pp. 1-37.
  11. Ghosh, A., and Jain, P.C. (2000), Financial Leverage Changes Associated with Corporate Mergers, *Journal of Corporate Finance*, 6(4), pp. 377-402.
  12. Hackbarth, D., and Mauer, D.C. (2012), Optimal Priority Structure, Capital Structure and Investment, *The Review of Financial Studies*, 25(3), pp. 747-796.
  13. Harford, J., Klasa, S., and Walcott, N. (2009), Do Firms Have Leverage Targets? Evidence from Acquisitions, *Journal of Financial Economics*, 93(1), pp. 1-14.
  14. Hovakimian, A., Opler, T., and Titman, S. (2001), The Debt-Equity Choice, *Journal of Financial and Quantitative Analysis*, 36(1), pp. 1-24.
  15. Hovakimian, A., Hovakimian, G., and Tehranian, H. (2004), Determinants of Target Capital Structure: The Case of Dual Debt and Equity Issues, *Journal of Financial Economics*, 71(3), pp. 517-540.
  16. Jory, S.R., Ngo, T.N., and Wang, D. (2016), Credit Ratings and the Premiums Paid in Mergers and Acquisitions, *Journal of Empirical Finance*, 39, pp. 93-104.
  17. Kim, E.H., and McConnell, J.J. (1977), Corporate Mergers and the Co-insurance of Corporate Debt, *The Journal of Finance*, 32(2), pp. 349-365.
  18. Korteweg, A. (2010), The Net Benefits to Leverage, *The Journal of Finance*, 65(6), pp. 2137-2170.
  19. Koziol, C., and Lawrenz, J. (2010), Optimal Design of Rating-Trigger Step-Up Bonds: Agency Conflicts Versus Asymmetric Information, *Journal of Corporate Finance*, 16(2), pp. 182-204.
  20. Lang, L.H., Walkling, R.A., and Stulz, R.M. (1989), Managerial Performance, Tobin's Q, and the Gains from Successful Tender Offers, *Journal of Finance*, 24, pp. 137-154.
  21. Levy, H., and Sarnat, M. (1970), International Diversification of Investment Portfolios, *The American Economic Review*, 60(4), pp. 668-675.
  22. Lewellen, W.G. (1971), A Pure Financial Rationale for the Conglomerate Merger, *The Journal of Finance*, 26(2), pp. 521-537.
  23. Modigliani, F., and Miller, M.H. (1963), Corporate Income Taxes and the Cost of Capital: A Correction, *The American Economic Review*, pp. 433-443.
  24. Ong, T.S., and Phing Phing, N. (2012), Capital Structure Before and After Merger and Acquisition: Banking Industry in Malaysia, *International Journal of Management Sciences and Business Research*.
  25. Rajan, R.G., and Zingales, L. (1995), What Do We Know About Capital Structure? Some Evidence from International Data, *The Journal of Finance*, 50(5), pp. 1421-1460.
  26. Shyam-Sunder, L., and Myers, S.C. (1999), Testing Static Trade-off Against Pecking Order Models of Capital Structure, *Journal of Financial Economics*, 51(2), pp. 219-244.
  27. Uysal, V.B. (2011), Deviation from the Target Capital Structure and Acquisition Choices, *Journal of Financial Economics*, 102(3), pp. 602-620.



# Innovation Management in Japan

Ana Sinha\*

The role of the innovation management in the Miracle story of Japan is one of rapid technological advancement in symphony with the key actors of innovation - the firm, the educational institutions, particularly the public institutes and finally, the Japanese government. At the same time, this innovation management system also had a role to play in the Financial Crisis of 1997. The aim of this paper is to look at the real difficulties in balancing the economic priorities of a nation state and the spectrum of its awareness and response metrics that are culture dependent – both explicitly and tacitly at all levels of knowledge creation, adaptation and application – in this case, with reference to the innovation management in Japan. This paper seeks to look at the evolutionary paradigm of the Japanese innovation management in the interplay of objectives and actions among the key actors, the consequent impact on the Japanese economy leading to a Miracle era and finally juxtaposes this development with the changing global circumstances of the 1990s, culminating in the 1997 crisis.

**Keywords:** Innovation, Innovation Management, Technology, Japan, 1997 Financial Crisis, Japanese Economic Miracle.

## Introduction

THE East Asian miracle of Japan in the post Second World War decade was in many ways led by a strong mix of disruptive and incremental innovation, wherein Japanese firms created a market space for their products that were both adapted from the West and often originated in their own labs. The innovation management structure of the Miracle era is a key aspect of the rapid technological advancement and sophistication of Japan on one hand, but has also had a role to play in the financial crisis of 1997.

This paper seeks to study the innovation management in Japan

---

\* Research Scholar, Indian Institute of Foreign Trade, New Delhi.

and its paradigms and the strikingly different roles it played in the economic miracle and the financial crisis. This is done by looking particularly at the measures taken for knowledge creation and dissemination. The major argument of this paper is based on the slow reaction to changing R&D realities and their impacts on the very perspectives of management behaviour as a result of in silo orientation of the interrelations of the key actors in the Japanese Innovation system. The paper is divided into three parts. The first part seeks a chronological explanation of the evolution of the Japanese innovation system and the consequent impacts of the Japanese experience in a successful role in the decades of the economic miracle. The second part studies the key

actors of innovation – the firm, the educational institutions, particularly the public institutes and finally, the Japanese government – and the key features of their role in the innovation management system of Japan. The third part, finally looks at the changed circumstances with rapid globalization in the 1990s juxtaposed with a lagged behind innovation system of Japan, that ultimately had a role to play in failing to create economic advantages that were necessary in the sudden increase in international competitiveness of companies and their products.

It is argued that it is the innovation management system of Japan that discouraged Japan's share in the new markets created from the technological

advancements from semiconductor technology to Integrated Circuits (ICs), that was to become the engine of growth in the international economies. This is because the innovation management system of Japan suited the needs of a catching up economy and not an international leader of the rapidly emerging and advancing industries, owing to its incremental approach to innovation itself. And as the Japanese economy went from strength to strength, its capacity to make disruptive decisions, management behaviour changes, simply reduced to a large extent as they became more and more adaptive and cautious to their roles and ability to take risks. The reasons for this shortcoming are also pursued on a minor note.

### Evolution of Innovation Management in Japan

The term "Innovation" can be easily referred to as any new idea, or product or service. However, a "business innovation" can be considered to be a new idea, or product or service that creates or adds value and has a financial viability and is thus, a part of the economic system. The "innovation management" is therefore, the process of creating a new idea, or product or service, and developing its business capability<sup>1</sup>. The concept of a national innovation system in its comprehensive approach "considers the role of different institutions and the interactions of different actors within the system to explain national comparative advantages in specific sectors"<sup>2</sup>. Its strength lies in going beyond the

traditional indicators of innovation performance such as, in terms of R&D expenditures or patents. The limitation of this approach is in demarcating the parameters of analysis as to what composes the study of this "national" innovation system from a pool of variable factors, in which the three key actors are the industry, the government and the academic institutions.

Among the three key actors in an innovation system, the objectives of the R&D policy are varied. For example, if the industrial approach is to be guided by the market's needs and demands to create products that can be manufactured in a cost-effective manner, the academic institutional approach is to train the scientists and technicians in basic and applied sciences to equip them in feasibly working in the industrial R&D sector. The government on the other hand, is mostly directed towards regulating the policies guiding the interactions between the other two actors, to propel the economic system of the country in a growth trajectory.

In order to understand the cultural psyche of the Japanese innovation management, it is important to observe the Japanese experience in its economic system and its motivations towards its management approach. There have been many management traditions and inputs that have continued through the decades right from the Meiji Restoration in the nineteenth century to the humiliation faced in the immediate decades post the Second World War, to the international recognition of a

competitiveness in Japanese products.

### The Journey

The *Meiji period* of Japanese economic system, set certain precedents of management behaviour that persisted in the post-World War period. The idea of modernizing without de-Japanizing, helped in construction of a management etiquette that understood and accepted the advantages and limitations of its cultural set up and realized the benefits of manoeuvring its behaviour suitable to the cultural conditioning of its labour. Some of the major lessons taken from the management experience under the Meiji, included, a major role for the state in economic organization, more centralized and co-ordinated investment strategies, with state planning and a close cooperation between government and business in the establishment and management of national industries. This resulted in the construction of a national industrial ideology that was based on self-improvement and a long-term perspective towards evaluating performance in an economic purview that was mostly guided by exports<sup>3</sup>.

The *post-World War period*<sup>4&5</sup>, in its early decades, saw an intense adaptation of the US products, where the duplication would not be as efficient in quality as the original, but would be of a good enough quality for the domestic consumers, under cheap prices. However, as experts such as Dr. William E. Deming, started helping the Japanese companies realize the importance of quality control, an earnest interest in the

core values and functioning of the manufacturing sector was pursued to make the products suitable for exports. Overtime, the quality of the Japanese products equalled and, in many cases, excelled over that of its Western counterparts.

The reasons for this success according to Xu, were three<sup>6</sup>. *Firstly*, an intense desire to overcome the complex of being a defeated nation at the earliest was the foremost concern of the Japanese population and its government; which is why the Japanese managers were more serious about learning advanced technologies than their American counterparts. *Secondly*, the lack of natural resources in Japan has developed a sense of crisis of survival, that is more astute than many other countries. The propensity to seek perfection or have as few shortcomings as possible in a product is seen as connected to the need to preserve and use resources to the maximum possible efficiency. *Thirdly*, the dependence of Japan on imports due to the lack of resources, forced an equally driving compulsion to produce quality products, at a cheap cost for export to earn sufficient foreign currency.

In the 1990s, the end of Cold War and the entry of Chinese industries into the global market gave unfavourable conditions for the Japanese industry. One, the dramatic rise of a low cost, neighbouring and geographically large China, which in addition had a lesser relative exchange rate than that of Japan and two, the revolutionary innovation in the

internet and other digital communication technologies, which caused a rapid switch of analogue (coordination-intensive) devices and equipment by digital (relatively coordination-saving) ones<sup>7</sup>. The close interlinkages between the firms, the government and the banks allowed for stability to improve over the decades in a secure environment, but in the 1990s era of rapid transformation, served as a hindrance to high risk measures that were the norm of the suddenly extremely competitive international market that was now quick to change owing to its own shift to the digital platform of internet. One can prudently begin a line of enquiry therefore, that the failure of the Japanese innovation system to accommodate the changing circumstances of product movement in the market, served as an important factor during the Asian Financial Crisis of 1997.

The reasoning for this assumption is explained in the following sections where the roles and functioning of the key actors – the government, the firm and the academic institutions are studied and the strengths and loopholes of each are addressed.

### Role of the Firm

In a 1999 study, it was calculated that more than 76 per cent of the R&D came from the private sector in Japan<sup>8</sup>. Yet, according to Fransman<sup>9</sup>, even this percentage severely underestimates the role of the firms in the overall innovation generation. This is because, a large chunk of

the innovation introduced by the firms does not come from its labs, but from its production floors, and is therefore not recorded in the R&D statistics. The contribution of the firms in innovation generation is mostly in fields of applied research and development, where the government has lesser influence. Japanese companies by the nature of their innovation, are committed and patient innovators.

The innovation management in the firm is guided by two different strands of networking – horizontal keiretsu – the banks, and vertical keiretsu – the suppliers. The first connects it to other firms and banks, that serve as committed shareholders. These committed shareholders do not shift their financial inputs from their invested firms quickly or even periodically, but have a long-term stake in the companies. This means that on one hand, the firm gets easy capital from the banks, and is thus, also allowed liberties to make in its corporate actions, without affecting its management behaviour. The other strand of networking is that a firm has in a vertical network with its suppliers that remain constant. These suppliers adapt according to the needs of the firm and are firmly entrenched with the Japanese management processes. These two strands are guided by mutual cooperation<sup>10</sup>.

In order to understand the nature of innovation generation in a Japanese firm, it is important to analyze the very nature of its management of knowledge. If we look at the knowledge creation

and transmission process in the firm, there are some distinct features<sup>11</sup>:

*Interdependent Models of Organizing*

In the Japanese management structure, the individual is seen as an interdependent entity who is part of an encompassing social relationship. This facilitates in developing a connectual and contextual knowing paradigm in which decisions are made according to specific relationships and situations when individuals connect with their environment. Figure 1 Connectual Incentive Structure in Japan (Jin, 2001, p. 68)

Since these interdependent models of organizing are not temporary in nature, the focus is

generally long-term, in terms of capabilities, market shares or welfare of employees. The firm therefore, is not a system of contracts, built on a desire to obtain maximum profits, but a group of people, who come together, pool their capabilities, to gain long term benefits collectively.

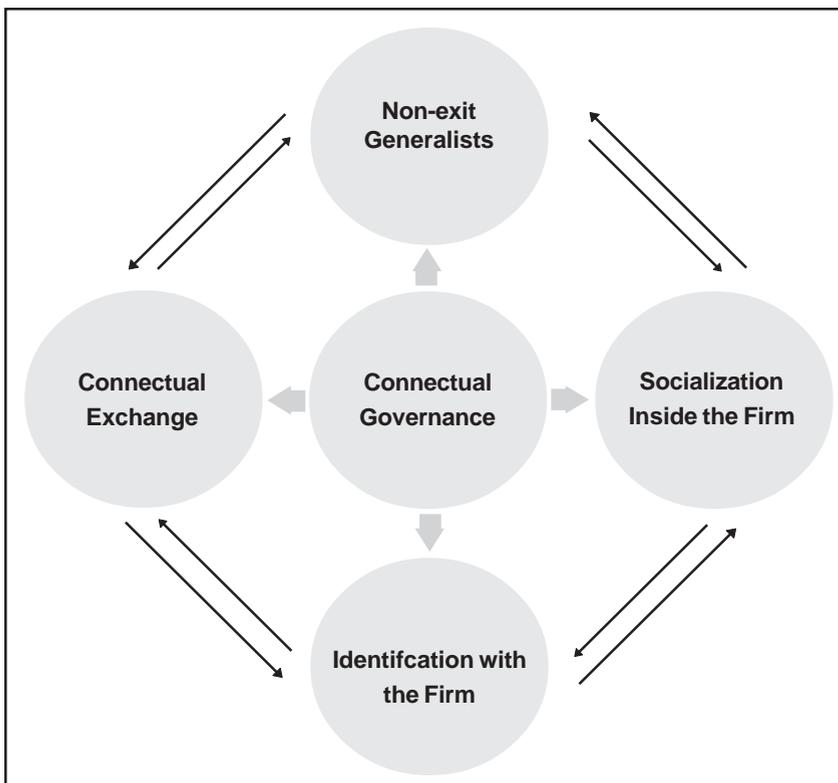
*Connectual Cultural Relations and Connectual Knowing*

The personal and collective interests are identified and achieved through connectual relations wherein, the emphasis is on the obligations and duties of the individual towards his organization. These obligations are dependent on a presumption of self-enforced social bonds that

secure reciprocal obligations. The keiretsu structure is inspired from these bonds, wherein, the Japanese markets are governed by the very same connectual links between producers and consumers, producers and suppliers, businesses with banks, businesses with governments, employers with employees.

These connectual relations are also connected to the concept of connectual knowing for knowledge generation. The knowledge created under these connectual relations is in turn, tacit, subjective, qualitative, relational, contextual, and situational. The innovations resulting from such a spectrum of knowledge finds expression in complex manufacturing sectors in Japan, in which the former helps in ensuring cutting edge competitiveness.

**FIGURE 1**  
**CONNECTUAL INCENTIVE STRUCTURE IN JAPAN**



*Integrating Knowledge*

The knowledge and the consequent innovation created, results in a widened perspective towards an interconnected relationship between R&D, manufacturing, marketing, and the consumers. The importance of qualitative feedback, wherein both broad and specific demands and needs of the consumer are identified, recognized and used to incrementally improve the products of the firm. Thus, knowing is predominantly complementary, which is based on trust among the members of the firm and leads to the primacy of imbedding mechanism that aim at maximizing the use of personal knowledge, skills and capabilities to create knowledge. The Just in Time production and delivery systems, lifetime

employment, on-the-job training, job rotation, design for manufacturing, cross functioning teams, among many other similar measures, together form an institutional innovation that aim at organically integrating the firm members or employees in a mutual knowledge creation process.

### *Competitiveness in Synthesising Knowledge*

The focus on the productive performance competitiveness, i.e., the manufacturing site's ability resulted from this coordination intensive model of innovation and production. The notion of competitiveness in Japan is based on a carefully knowledge synthesized from detailed subjective attitudinal surveys of consumers, a long-term commitment to the product and its target environment. The competitive advantage of Japanese firms thus lies in this in tacit, contextual knowing which is qualitative in nature and obtained from consumers not through detailed surveys, but a constant feedback from the delivering vendors and similar such departments that have direct access to the consumers.

The periodic job rotations allow for the experiences gained by employees in each department to disseminate their experiences all over the firm. Since each constituting department of a firm and its product formulation and selling process is interdependent and linked in a non-linear fashion with each other through physical, knowledge, or parametrical links, the knowledge of all intricacies of these relation specific links in the form of a generalist approach

facilitates competitiveness in non-modular systems design, such as automobiles, electronics, and optoelectronics. At the same time, however, for modular system design, an isolated penetrated application of knowledge is often held as time saving and more competitive, such as in software industry.

### **Role of the Government**

The government in Japan has a lesser role in R&D as compared to its role in securing international competitiveness of the Japanese firms. While the R&D remains very much commercially targeted in the firms, the Japanese state in the early post-World War decades was involved with the financing through linkages with the banks and helped in bringing international exposure to the firms and a thrust towards applied research in academic institutions learning framework.

### *Emphasis on Technical Education*

Japan's defeat in the Second World War left the Japanese educational system and structure in a precarious position – *with 4000 out of 44000 schools destroyed, nearly all students idle and only one-quarter of the necessary textbooks available.*<sup>12</sup> The Economic Investigation Council of 1963 in its report on manpower development recognized a 'larger than expected' gap between the education system and the demands of society, finding it necessary to view the content and the system of education for manpower development along with economic progress.

This meant an intensified, prefecture penetrated systematic

network of vocational training centres and technical institutes and courses, capable of furnishing workers suited to the requirements of the industries. The traditional love for mathematics as has been aforementioned, found a suitable furnace for implementation and application in the tertiary sector to a large extent.

### *Supporting R&D*

The government sponsored technological development programmes, as a research consortium were implemented over decades in cooperation with competing firms to generate and increase market shares. These include the Large-Scale Projects, Next Generation Projects, etc. But with rapid changes in fields such as biotechnology and information technology, infrastructure building is not enough to keep pace with the increasing competitiveness<sup>13</sup>.

In order to provide financial support, the state followed a policy of tax credit system<sup>14</sup>, in which the firms could deduct a fixed proportion of R&D spending in the current, over and above the highest expenditure incurred in previous years. This nature of the system meant no gains unless research spending would be increased. The non-profit companies would also lose out on the tax benefits.

### *Choosing the Winning Industry*

An interesting aspect about a lot of literature on the East Asian Miracle, particularly with respect to the developmental state model is the sheer lack of explicit material on the exact or near criteria of industrial selection by the Japanese

government, that made its choices so successful. The Japanese government favoured certain industries and therefore, their innovation products over others, for example, textiles and processed food were clearly supported throughout the 1960s, but were transferred by transport equipment, electrical machinery, basic metals and chemicals. However, the industries that remained in favour well into the Asian Financial Crisis in 1990s – the electrical machinery, transport equipment and processed food – were brought into selection in the 1970s.

Saadia Pekkanen, in a broad study over post War decades in 10 major industries enjoying state favour, has argued that the industrial selection criteria are guided by both economic and political pressures. If the computer industry, in its hardware manufacturing was favoured by the state for its externalities and technology leakages from the USA, the semiconductors were brought into Japan mainly because of the efforts of the private sector. The telecommunications firms that were powerful enough to influence MITI were able to ensure the entry of semiconductors industry due to their own involvement in this sector<sup>15</sup>.

### ***Regulating Inter Firm Competitiveness***

The MITI with its strong information networks<sup>16</sup> has a macro view of the industrial footprints and a better grasp at future possibilities, that are much more comprehensive than the firms. It has been able to identify new technology area that have potential markets. In resolving international trade conflicts, the

government has worked hard at bringing a complementarity among competing firms, so that the competition in the market does not get dispersed in pockets among the Japanese firms, but is adjusted in such a manner that the competitiveness remains spear headed. Therefore, should a company seek to aggressively expand its exports in a country, the other firms would voluntarily restrict theirs to reduce the trade conflict. This level of solidarity is maintained by the state.

### **Role of Universities**

#### ***Providing Trained Graduates***

The purpose of the Industrial Law of 1951, acknowledged that '*industrial education is the basis of the development of the industry and the economy of [the] country*'. A result of this increasing tilt of attention given to industrial education can be evidenced in the following statistical data. In 1969, out of 1,414,000 persons attending 8000 technical training schools, some 12 per cent received technical training in areas such as industrial arts, automobile mechanics and electric & electronic mechanics. In 1969 also, 419 public training centres trained 123,780 workers in their 2317 courses, while in the same year 459 individual firms and 721 co-operatives trained some 83,000 workers in their training centres, 69 per cent of whom were youths under the age of 18<sup>17</sup>.

A criticism provided to the education paradigm is provided that the prescribed system although good at adapting technology, is not as competent at

generating it. The framework aims more at adequate capability to secure recruitment and depends more on the in-house training provided at the firms that will train its employees according to its management requirements. It is, therefore, argued that the masses of engineering graduates are capable of continuously improving their products, but not at periodically disrupting them<sup>18</sup>.

#### ***Technology Transfer***

It is also true, at the same time, that the Japanese firms draw more from their own research pools in their universities in scientific research<sup>19</sup>. The number of scientific publications by Japanese scientists and engineers in leading academic journals is second only to that of the US, despite the language barriers<sup>20</sup>. The technology transfer process in Japan usually goes backward from the consumers' desire for new products, that are taken up by the firms to their production facilities. The technical difficulties of the production department are then taken to the universities, for a collaborative problem-solving exercise.

#### ***Repositories of Scientific Knowledge***

The universities also serve as repositories of both basic and applied research that both the government and the firms can return to resolve technical or logistical concerns. As a local source of scientific knowledge, the aim of these institutions is not to profit from the patents of their inventions, but to ensure dissemination of the new information to maximum firms, for subsequent production for

consumption. This perspective has outlined many industry – university associations, such as in biotechnology, electricity and robotics in the recent years, where collaborations have resulted in huge knowledge spill overs for the benefit of knowledge building.

### Observations on the Japanese Innovation System with the Advent of New Technology and its Implications on Asian Financial Crisis 1997

Gilpin in a 1996 study commented that,

*‘...a society can become locked into economic practices and institutions that in the past were congruent with successful innovation but which are no longer congruent in the changed circumstances. Powerful vested interests resist change, and it is very difficult to convince a society that what has worked so well in the past may not work in an unknown future. Thus, a national system of political economy that was most “fit” and efficient in one era of technology and market demand is very likely to be “unfit” in a succeeding age of new technologies and new demands’<sup>21</sup>.*

The essence of this theory is that during successive historical periods the fundamental requirements for corporate success and economic competitiveness change primarily in response to environmental change. Thus, new needs and opportunities lead to either an adaptive or an innovative response. The more successful firms are believed to be those that

develop an innovative response or strategy. This means that these successful firms manage to innovate an organizational structure that empowers them to take advantage of the changes.

Glyn O. Philips in his 1989 work on comparison of innovation and technology transfer in Japan and Europe in his conclusion, expressed grave concerns about the applied research-based investment in R&D in Japan, when the percentage of basic research in Japan was limited to only 15 per cent of the total budget of Japan<sup>22</sup>. The concern was towards the chances of losing out on coming out of the catching up phase. This was because as the rate of inventions coming out from basic research shifted the very nature of profitability spectrum from analog to digital interfaces, the primarily manufacturing based miracle of Japanese economy faced a danger of not keeping pace with the change.

According to Espen Moe, the Japanese firms were not prepared for the rapid shift away from traditional manufacturing industries, that they had just become leaders in, to knowledge-based services rooted in the breakthrough in information and communications technologies (ICTs). Instead of going for an innovation strategy to control this new phenomenon, the industries became more and more protective of their systems and mechanisms. The flexibility afforded by the intangible nature of the digital age, were not grasped by the firms nor the government itself. For example, as early as 1980s, MITI had sought new industrial sectors

and singled out micro electronics. However, most of its Technopolis constructed in the 1980s and 1990s were failures. Moe believes that the ‘*fundamental weaknesses in Japanese sciences*’ may have shared the blame. This was because the manufacturing bases, mass produced, collectively grounded students from the academic institutions were not trained to tackle the individualistic nature of the new internet technologies<sup>23</sup>. The property bubbles of the 1990s and the appreciation of the yen currency, were not supplemented by a rapid takeover of the emerging digital industries, that severely diluted key industries such as the audio cassettes and compact disc industry, that in the Japanese innovation management system formed some of the first-tier innovation products.

There are many recent studies and investigations on innovation in Japan that indicate a certain measure of laxity in successfully translating radical innovations into profits. A report of the National Institute of Science and Technology Policy, Ministry of Education, Culture Sports and Technology (2014)<sup>24</sup> in its study of 20,405 companies, the realization ratio of product innovation and process innovation in Japan is low in comparison with the US and European Countries. Among the factors responsible are the lack of certain abilities among employees, the lack of information about technologies and markets, the uncertainty of demand for new products and services, and the high costs of innovation.

A report of Deloitte Tohmatsu Consulting Co. Ltd. and Deloitte

Tohatsu Financial Advisory Co. Ltd. (2013)<sup>25</sup> in its study of about 3,035 companies, observed that the ratio (by consolidation) of the sales of new businesses, products, and services that Japanese companies introduced into the markets within the most recent three years to the total sales is half that of the US companies. The problems enlisted as reasons for this include, fewer innovative top and middle managers, new ideas are created under an extension of existing strategies, weakness in innovation judgement, lack of mechanisms to repeatedly produce new business and weak actions pertaining to utilizing intellectual property.

The investigation that the Japanese Ministry of Economy, Trade and Industry assigned to the Techno Research Institute (2012)<sup>26</sup> considered 2,093 listed companies and 2,543 non-public companies. The highpoints of this investigation are as follows:

- (1) *Firstly*, needs based innovations are 64 per cent, while seeds-based innovations are 36 per cent.
- (2) *Secondly*, strategically produced innovations account for 75 per cent of all cases of products, services, technology and related firms.
- (3) *Thirdly*, incremental innovations are more than radical innovations by a ratio of 3:1.
- (4) *Finally*, most of the firms desire an increase in radical innovations due to their impact on performance and competitiveness.

However, there is an interesting paradox to this situation. Japan in the post War period did in fact manage to innovate both incrementally and radically through the 1970s and helmed many radical projects such as the bullet trains, and many audio devices such as the Walkman, and incremental in computer hardware. These innovations were built on many of the management principles mentioned above and were constantly improved through collective endeavours at improvement, with on-the-job training and strong feedback mechanisms.

But why were the changes not as seamless and as dedicate in 1980s? There are a few reasons – *Firstly*, the companies and the government with their success in catching up, were both convinced of the feasibility of their management principles. The lifelong employment, seniority wages and a general harmony among the hierarchical levels of organization were considered strong enough to handle the surge of new technology and the new avenues of commercial profitability.

*Secondly*, the harmony between the company, the government and the institutions itself served as a major impediment because making a disruption in one element would certainly mean the disruption of the entire structure at the same time. One could argue that this is exactly what one aims for on changing the dynamics of a single element to expect a chain reaction of changes

in all connected elements, but the cultural basis of the Japanese management principles, are based on a harmonious shared vision of cooperation leading to growth. This would make the various actors reluctant towards the desired changes.

*Thirdly*, the Japanese economy of 1980s and the Japanese economy of 1950s were extremely different, while one had to find means of survival in its every decision, the other was comfortable in the cushioning it had gained over decades of continuous economic development.

*Finally*, the social innovation<sup>27</sup> in Japan, which was in existence since the late Tokugawa period's opening of the nation, had a major role in the dynamism of the innovation management in Japan. This social innovation included the development of educational institutions, bureaucratic setups, financial relationships between the banks and the firms, etc. In the post-World War period, however, once certain standardizations, both concrete and tacit, such as compulsory education, university-industry interactions were put in place, the social innovation framework became static. The rule of a single party over decades in a democratic setup, did offer stability to the economic system, but also weaned away its ability to judge forthcoming opportunities and risks, in terms of risky loans, missed market opportunities, and an intensive competitiveness aimed at going beyond the contemporary market spaces and options.

## Conclusion

The major problem in studying any aspect of Japan's economic structure is in the explicit display of two strikingly different perspectives – one, that seeks answers from a corporate market driven, regulatory state-based perspective and two, that finds its solutions from the developmental state model. Consequently, a study of the innovation management in Japan can be easily subjected to these two perspectives – either it is the corporate management or it is the Japanese state, or as most of the studies invariably focus on MITI, Ministry of International Trade and Industry, that is the hero of the Japanese miracle and the villain of its financial crisis. It is interesting to note that the same practices of seniority wages, lifelong employment and enterprise unions are held equally responsible for both the triumph

of the miracle and the failure in the crisis.

The Japanese innovation system is fundamentally strong in its dedication to create a quality-controlled product for international markets and to continuously improve its products over decades of research. This approach has certainly helped in creating the Brand Japan that is now synonymous with high quality, cost effective products. But this approach also serves as a hindrance in an extremely speeding rate of market creation and capture that is solidly grounded in an even faster technological and design advancement that is not strictly based on hardware material, but a digital interface that is simultaneously connected to remote parts of the world. The 1990s wave of radical innovation based economic upheaval was not caught on fully by the Japanese innovation system. The tacit nature of

knowledge creation, transmission and application did not make sufficient room for scientific knowledge, that is in many ways individualistic in its usage and transmission. This certainly had an important role to play in the burgeoning Asian Financial Crisis where property bubbles and foreign currency inflations notwithstanding, emerging industries were not pursued vigorously on account of a complacency towards a stable seeming economy.

Thus, it is quite clear that changes are indeed required and are happening in Japan too. The question remains exactly how far the Japanese innovation system will ultimately go in its bid to improve itself without losing its most winning points of a cultural awareness and acceptance of a distinct Japanese psyche that is applicable to its innovation management process.

## NOTES

<sup>1</sup> Popa, Preda, and Boldea, 2010.

<sup>2</sup> Umemura, 2014.

<sup>3</sup> Herbig and Jacobs, 1997.

<sup>4</sup> Herbig and Palumbo, 1994.

<sup>5</sup> Xu, *The Strengths and Weaknesses of Japanese Innovation*, 2014.

<sup>6</sup> Xu, *The Strengths and Weaknesses of Japanese Innovation*, 2014.

<sup>7</sup> Fujimoto, 2014.

<sup>8</sup> Fransman, 1999, p. 157.

<sup>9</sup> Fransman, 1999.

<sup>10</sup> Jofre, 2008.

<sup>11</sup> Jin, 2001.

<sup>12</sup> Foljanty-Jost, 2004.

<sup>13</sup> Goto, Introduction, 1997.

<sup>14</sup> Goto, *Japan's National Innovation System: Current Status and Problems*, 2000.

<sup>15</sup> Pekkanen, 2003.

<sup>16</sup> Fransman, 1999.

<sup>17</sup> Kobayashi, 1976.

<sup>18</sup> Castells, 2000, p. 251.

<sup>19</sup> Fransman, 1999.

<sup>20</sup> Goto, *Japan's National Innovation System: Current Status and Problems*, 2000.

<sup>21</sup> Gilpin, 1996.

<sup>22</sup> Philips, 1989.

<sup>23</sup> Moe, 2003.

<sup>24</sup> Hamada, 2016.

<sup>25</sup> Hamada, 2016.

<sup>26</sup> Hamada, 2016.

<sup>27</sup> Xu, *The Strengths and Weaknesses of Japanese Innovation*, 2014.

## BIBLIOGRAPHY

1. Branstetter, L.G., and Nakamura, Y. (2003), Is Japan's Innovative Capacity in Decline? In N.B. Research, M. Blomström, J. Corbett, & F. Hayashi (Eds.), *Structural Impediments to Growth in Japan*, Tokyo: University of Chicago Press, pp. 191-223.
2. Castells, M. (2000), *End of Millenium (2nd edition)*, Malden: Blackwell.
3. Christensen, C.M. (1997), Discovering New and Emerging Markets. In C.M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Boston, MA: Harvard Business School Press, pp. 117-128.
4. Clark, R. (1979), *The Japanese Company*, New Haven and London: Yale University Press.
5. Foljanty-Jost, G. (2004), Education and Educational Policy. In J. Kreiner, U. Mohwald, H.D. Olschleger, J. Kreiner, U. Mohwald, and H.D. Olschleger (Eds.), *Modern Japanese Society*, Vol. 9, pp. 83-108. Leiden, Netherlands: Koninklijke Brill NV.
6. Fransman, M. (1999), *Visions of Innovation: The Firm and Japan*, Oxford and New York: Oxford University Press.
7. Fujimoto, T. (2014), Innovation Management in Japan. In M. Dodgson, D.M. Gann, and N. Phillips (Eds.), *The Oxford Handbook of Innovation Management*, pp. 335-354. Oxford: Oxford University Press. doi:10.1093/oxfordhb/9780199694945.013.018
8. Gilpin. (1996), Economic Evolution of National Systems, *International Studies Quarterly*, 40(3), pp. 411-431.
9. Goto, A. (1997), Introduction. In A. Goto, and H. Odagiri (Eds.), *Innovation in Japan*, pp. 1-19. Oxford: Clarendon Press.
10. Goto, A. (2000), Japan's National Innovation System: Current Status and Problems, *Oxford Review of Economic Policy*, 16(2), pp. 103-113. doi:doi.org/10.1093/oxrep/16.2.103
11. Haghirian, P. (2010), *Understanding Japanese Management Practices*, New York: Business Expert Press. doi:10.4128/9781606491195
12. Hamada, K. (2016 September), Strategic Management and Profit Creation in the Context of Innovation: The Management of Innovation Value Chains, *Japanese Management and International Studies*, 13, pp. 3-18. Retrieved 21 October 2018.
13. Herbig, P.A., and Palumbo, F. (1994), A Brief Examination of the Japanese Innovative Process: Part 2: The Good, the Bad, and the Ugly, *Marketing Intelligence & Planning*, 12(2), pp. 38-42. doi:https://doi.org/10.1108/02634509410057482
14. Herbig, P., and Jacobs, L. (1997), A Historical Perspective of Japanese Innovation, *Management Decision*, 35(10), pp. 760-778. doi:https://doi.org/10.1108/00251749710192084
15. Herstatt, C., Stockstrom, C., Tschirky, H., and Nagahira, A. (Eds.) (2006), *Management of Technology and Innovation in Japan*, Berlin: Springer.
16. Jin, D. (2001), The Dynamics of Knowledge Regimes: Technology, Culture and National Competitiveness in the US and Japan, London and New York: Continuum.
17. Jofre, S. (2008), Overview and Analysis of the Japanese and US Innovation Systems, *SUCCES WP1*, pp. 1-18. Stockholm: Technical University of Denmark.
18. Kawakami, T. (2017, January 17), Establishing Japanese-Style Innovation Theory to Bridge Technology and Marketing, Retrieved 20 October 2018 from The Japan News: [https://www.yomiuri.co.jp/adv/wol/dy/research/kyoso\\_170117.html](https://www.yomiuri.co.jp/adv/wol/dy/research/kyoso_170117.html)
19. Kobayashi, T. (1976), Education and Economic Development. In T. Kobayashi, *Schools, Society and Progress in Japan*, pp. 88-106. Pergamon Press.
20. Moe, E. (2003), An Interpretation of the Asian Financial Crisis: Innovation Systems and Economic Performance in a Period of Transformation, *Hawaii ICSS. Hawaii*.

21. Nomura, K. (1989, January), The Context for Innovation in Japan, *Canada-United States Law Journal*, 15(51), pp. 51-54. Retrieved October 20, 2018, from <http://scholarlycommons.law.case.edu/cuslj/vol15/iss/13>.
22. Odagiri, H. (2017), Competition Policy and Innovation: An Introduction with Illustrative Cases from Japan. In Y. Honjo (Ed.), *Competition, Innovation and Growth in Japan*, pp. 9-30. Singapore: Springer.
23. Ota, M., Hazama, Y., and Samson, D. (2013), Japanese Innovation Processes, *International Journal of Operations & Production Management*, 33(3), pp. 275-295. doi:<https://doi.org/10.1108/01443571311300773>.
24. Pekkanen, S.M. (2003), *Picking Winners? From Technology Catch-up to the Space Race in Japan*. Stanford, California: Stanford University Press.
25. Philips, G.O. (1989), *Innovation and Technology Transfer in Japan and Europe: Industry-academic interactions*. London and New York: Routledge.
26. Popa, I.L., Preda, G., and Boldea, M. (2010), A Theoretical Approach of the Concept of Innovation, *Managerial Challenges of the Contemporary Society*(1), pp. 151-156. Retrieved October 22, 2018, from <ftp://ftp.repec.org/opt/ReDIF/RePEc/bbu/wpaper/151-156.pdf>
27. Suzuki, J., Tsukada, N., and Goto, A. (2014), *Innovation and Public Research Institutes: Cases of AIST, RIKEN, and JAXA*. Tokyo: Research Institute of Economy, Trade and Industry (RIETI).
28. Thomson, S. (2016, October 7), 5 Japanese Innovations that Changed the World. Retrieved October 23, 2018, from World Economic Forum: <https://www.weforum.org/agenda/2016/10/5-japanese-innovations-that-changed-the-world/>
29. Umemura, M. (2014), Crisis and Change in the System of Innovation: The Japanese Pharmaceutical Industry during the Lost Decades, 1990-2010, *Business History*, 56(5), pp. 816-844. doi:10.1080/00076791.2013.847428
30. Whittaker, H. (2001, March), *Crisis and Innovation in Japan: A New Future Through Techno- Entrepreneurship, Working Paper No. 193*. Cambridge: ESRC Centre for Business Research, University of Cambridge.
31. Xu, F., and Nash, W.R. (2010), The Structure of Innovation, *Kindai Management Review*, 1, pp. 110-117. Retrieved October 20, 2018
32. Xu, F. (2014), The Strengths and Weaknesses of Japanese Innovation, *Kindai Management Review*, 2, pp. 97-105.



# Leadership in VUCA World

Himani Mishra\*

The term VUCA- Volatility, Uncertainty, Complexity and Ambiguity has become almost synonymous to the Organizational leadership where leaders are expected to combat all types of crisis situations with wits and guts. In this “disruptive” world where technology, political conditions and economic scenario changes in a speck of a second, it has become increasingly important for the organizational leaders to be able to fray “VUCA” situations in business environment. This article will throw light on all the aspects that could be identified and associated with business leadership to make Organizational leadership much easier and humane in its qualities. This paper will highlight how leaders can attain Level 5 leadership as described by Jim Collins by building enduring greatness through paradoxical blind of personal humility and professional will. Learned optimism as defined by Martin R. Seligman, will be reflected upon to get through ambiguous, volatile and complex situations. Integrating organizational spirituality with leadership for creating service and welfare oriented leaders, and hiring the right person so that organizational commitment and performance efficiency is maintained will be discussed. Creating a legacy through a sustained leadership which not just creates an ambitious organization, but also uplifts employees in their economic, mental and physical capacity, will be examined. The article will also try to examine how these factors reinforce each other and facilitate one other.

**Keywords:** VUCA, Organizational Leadership, Level-5 Leadership, Leader’s Legacy, Organizational spirituality.

THE term VUCA- Volatility, Uncertainty, Complexity and Ambiguity has almost become synonymous to the Organizational leadership where leaders are expected to combat all types of crisis situations with wits and guts. In this “disruptive”, world where technology, political conditions and economic scenario changes in a speck of a second, it has become increasingly important for the organizational leaders to understand “VUCA” in business environment. VUCA is an acronym which was first used

in 1987 – to describe or to reflect the volatility, uncertainty, complexity and ambiguity of general conditions and situations drawing on the leadership theories of Warren Bennis and Burt Nanus. The US Army War College introduced the concept of VUCA to describe the volatile, uncertain, complex and ambiguous multilateral world. A comprehensive description of the four terms is given below (Rodriguez and Rodriguez 2013; Kraijeenbrink, 2018; Horney *et al.*, 2010; Bennett and Lemoine, 2014).

(1) *Volatility* - Volatility refers to the speed of change in an industry, market or the world in general. The challenge is

unexpected or unstable and may be of unknown duration.

(2) *Uncertainty* - Uncertainty refers to the extent to which we can confidently predict the future.

(3) *Complexity* - Complexity refers to the number of factors that we need to take into account, their variety and the relationships between them. The situation has many interconnected variables and factors and it becomes difficult to decipher the causal link.

(4) *Ambiguity* - Ambiguity refers to a lack of clarity about causal relationships.

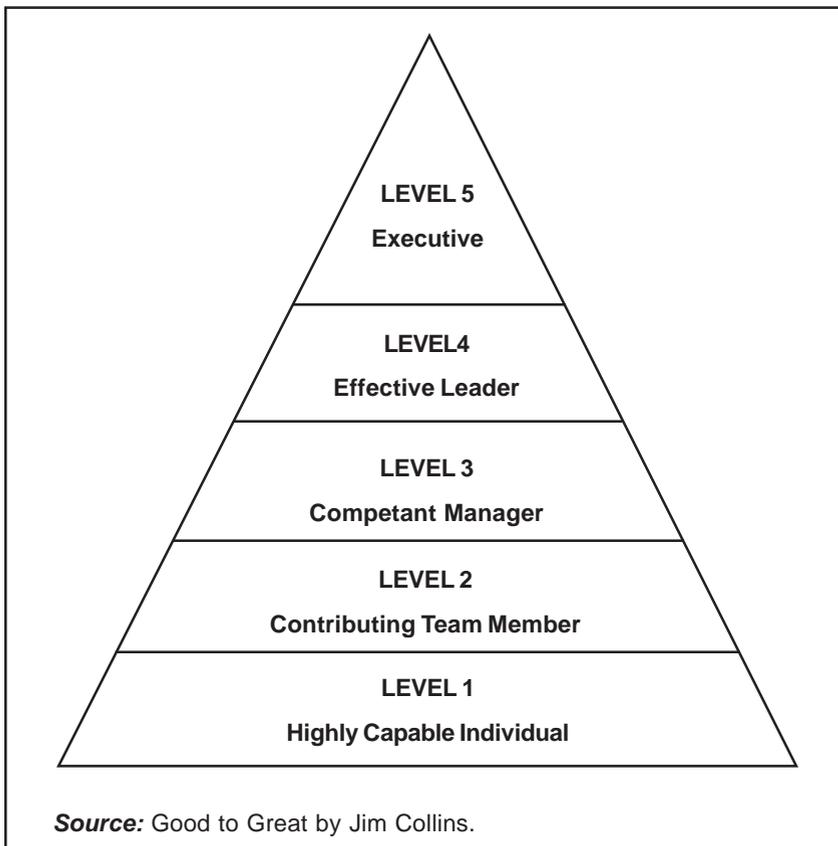
---

\* Research Scholar, Indian Institute of Foreign Trade, New Delhi.

**FIGURE 1**  
**LEVEL 5 LEADERSHIP**



**FIGURE 2**  
**LEVEL 5 LEADERSHIP**



In the VUCA world it has become immensely important for the leaders to opt for a dynamic stance rather than having rigid mindset. The possibilities of Responsible leadership, Cloud leadership, Transformational leadership in VUCA World has been illustrated in an elaborate way in the previous literature (Sarkar, 2016; Rodriguez and Rodriguez, 2015). There has been enormous discussion about how a leader in VUCA world needs to have Vision, Understanding, Agility, Cooperation, Collaboration (Horney 2010), but in this article, I would like to highlight concepts which have been existing or developed in the domain of organizational behaviour, and how they can be juxtaposed in leadership to bring out the best of leader and help him face situations in VUCA World.

**Level 5 Leadership**

The concept of Level 5 Leadership was propounded by Jim Collins in his book "Good to Great". Level 1 can be said as highly capable individuals who make productive contributions through talent, knowledge skills and good work habits. Level 2 is contributing team member who works productively in a team. Level 3 is a competent manager who organizes people and resources towards achievement of objectives. Level 4 is effective leader possessing clear vision and set high performance standards. Level 5 leaders are those who build enduring greatness through paradoxical blind of personal humility and professional will. For instance, Jim Collins quote

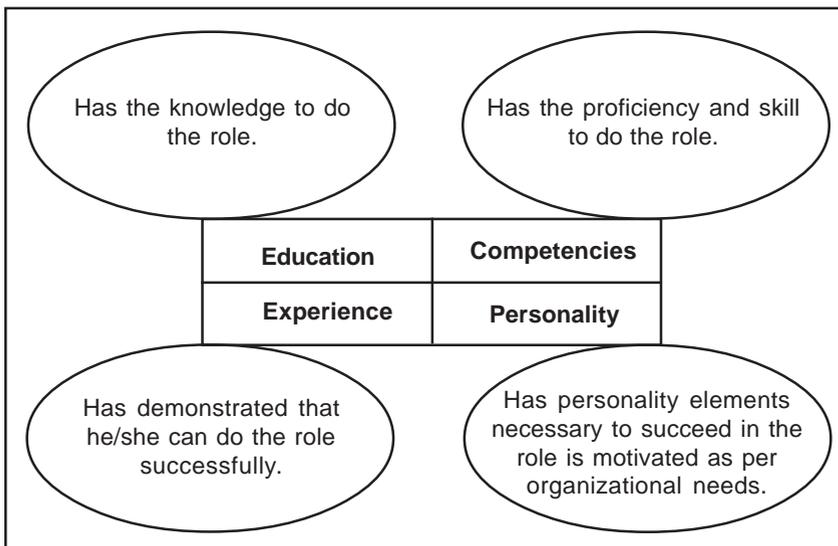
Darwin Smith of Kimberly Clark as Level 5 Leader (Collins, 2001). Level 5 Leaders have some eminent qualities. They turn the mirror inside when things go bad and try to decipher the reason. They do not work for fame, fortune and power. Now if we observe how Level 5 Leadership can be used in VUCA world, the Level 5 leaders would be the initiators who would confront the risk and the brutal facts. They will give credit to the other people and will not play the blame game. They will hear everyone around and take along everyone with them which will help them to bear the storm in the sea of VUCA World. "Rinsing the cottage cheese" is a phrase used often by Jim Collins in the book. Meaning Super discipline, it will help leaders to evolve in VUCA world.

**Hiring the Right**

The companies always chase to hire the best, the most talented. But key to the hiring the

appropriate person is hiring the right, not just hiring the best. Now how will we decipher who is the right person for the position. The below framework given by Abhijeet Bhaduri in his book "Don't Hire the Best" can solve the aforementioned question. Education and experience happens to affect at entry level, but at the leadership level the facet which affects the most is Personality. While hiring people in senior level roles, focus should be on assessing personality fit with the role and organizational culture (Bhaduri, 2012). Throwing light in context of VUCA world, the employee who is being selected, must be seen is right rather than being best, and most importantly has personality traits to take up leadership positions in future. An appropriate application of the framework given below will help to select the "right" employee who will be able to confront situations in VUCA World.

**FIGURE 2  
HIRING THE RIGHT**



**Legacy Culture**

In their book "A Leader's Legacy" James M. Kouzes and Barry Z. Posner talk about how leaders need to create a legacy of their own by possessing and displaying certain characteristics to their colleagues and subordinates. They talk about many qualities that the leaders can inculcate. They examine that a leader can create his legacy by being the one who is passionate and is willing to suffer for the purpose of the organization. They are forward looking and are ready to take the risk. They believe in constructive criticism and are followers too. (Kouzes and Posner, 2006) Practicing such qualities, they are able to set up a legacy culture and this legacy is inherited by the upcoming leaders. Such a culture makes it easy to redress any situations that arise in the VUCA World. The qualities possessed and practiced in such a culture evolves the leader and makes him strong to face counter situations.

**Learned Optimism**

In his book "Learned Optimism" Martin Seligman describes how optimism could be learned and practiced and can be especially applied by an individual employee and the organization as a whole. Learned Optimism certainly means where the person observes life situations with certain positivity, looking at the brighter side of the situation. Learned optimism bases itself on the explanatory style of a person regarding a situation. The way, the situation is being perceived makes all the difference. The

explanatory style theory of success says that in order to choose people for success in a challenging job, three characteristics should be considered - aptitude, motivation and optimism (Seligman, 1991).

Hiring such individuals who possess a certain optimism will lay the foundations of the leaders who will productively solve the situations in VUCA environment. The person can be gauged for his optimism towards a situation by testing his optimism levels with certain psychometric test. Such individuals if hired will propagate a culture of learned optimism thus creating a positive organization.

**Organizational Spirituality and Spirituality Based Leadership**

Donde P. Ashmos and Dennis Duchon have attempted to define spirituality in terms of inner life of an individual, meaning and

purpose and sense of connection and community at workplace (Ashmos and Duchon, 2000). Giacolone and Jurkiewicz in their breakthrough book “Handbook of Workplace Spirituality and Organizational Performance” define workplace spirituality as a framework of organizational values evidenced in the culture that promotes employees’ experience of transcendence through the work process, facilitating their sense of compassion and joy (Saxena, 2011). Spirituality practiced in organization and spirituality based leadership can help organization and the leader to sail through VUCA World. A leadership that integrates individual’s spirituality and rationality is the spirituality based leadership (Pruzan, 2011). Stephen Covey, renowned corporate leader and authority on leadership supports the notion of spirituality based leadership. He states that

spirituality based leaders respect others and are guided by the fundamental ethic of service to others (Sengupta, 2011). And Spirituality in organization leads to enhanced performance by the employees which can be a motivation for organizations to engage in spirituality and promote spirituality based leadership (Rego et al. 2007).

**Conclusion**

Organizations need to understand this fact that they cannot live in silo, they will be affected by external factors. An organization possessing growth mindset can pass through the storm, and a growth mindset is instilled in organization by its leaders. The above mentioned are some ways in which organizations can evolve. Level 5 Leadership and Hiring the right person will happen at individual level. Legacy culture and spirituality will take place as group behaviour in organization. Learned optimism can take place at both organizational and individual level. An interesting fact to be noted here is that all these concepts are inter related with each other and reinforce each other in one way or the other. For instance, Spirituality throughout the organization brings optimism in the organization and such an environment helps in building legacy culture. In same way, Level 5 Leadership and Spirituality and Learned Optimism, all these three factors reinforce each other. The company can pick the most appropriate ones and company can blend a perfect concoction which it can use to confront the situations in the VUCA World.

**FIGURE 4**  
**REINFORCING AND INTER-RELATED NATURE OF THE FINE FACTORS TO PRODUCE FINEST LEADERSHIP IN VUCA SITUATION**



## REFERENCES

1. Ashmos, D.P. and Duchon, D. (2000), Spirituality at Work, *Journal of Management Inquiry*, 9(2), pp. 134-145. doi:10.1177/105649260092008
2. Bennett, N., Lemoine, J. (2014), What VUCA Really Means for You?, Retrieved from <https://hbr.org/2014/01/what-vuca-really-means-for-you>
3. Bhaduri, A. (2012), *Don't Hire the Best: An Essential Guide to Picking the Right Team*. Noida, Uttar Pradesh: Harper Collins.
4. Collins, J. (2001), *Good to Great*, London, UK: Random House Business Books.
5. Horney, N., Pasmore, B., and Shea, T. (2010), Leadership Agility: A Business Imperative for VUCA World, *People and Strategy*, Vol. 33 (4)I, pp. 32-38.
6. Kouzes, J.M. and Posner, B.Z. (2006), *A Leader's Legacy*, San Francisco, California: John Wiley.
7. Kraijeenbrink, J. (2010), What Does VUCA Really Mean? Retrieved from <https://www.forbes.com/sites/jeroenkraaijenbrink/2018/12/19/what-does-vuca-really-mean/>
8. Pruzan, P. (2011), Integrating Rationality and Spirituality in Leadership, *Integrating Spirituality and Organizational Leadership*, 8, pp. 11-19.
9. Rego, A., Pina, E., Cunha, M., and Souto, S. (2007), Workplace Spirituality, Commitment, and Self Reported Individual Performance: An Empirical Study, *Management Research: Journal of the Iberoamerican Academy of Management*, 5(3), pp. 163-183. doi:10.2753/jmr1536-5433050303
10. Rodriguez, A., Rodriguez, Y. (2015), "Metaphors for Today's Leadership: VUCA World, Millennial and "Cloud Leaders", *Journal of Management Development*. Vol. 34 (7), pp. 854-866. <https://doi.org/10.1108/JMD-09-2013-0110>
11. Sarkar, A. (2016), We Live in a VUCA World: The Importance of Responsible Leadership, *Development and Learning in Organizations: An International Journal*, Vol. 30 (3), pp. 9-12.
12. Saxena, N. (2011), Integrating Spirituality and Organizational Leadership, *Integrating Spirituality and Organizational Leadership*, 8, pp. 152-160.
13. Seligman, M. (1991), *Learned Optimism - How to Change Your Mind and Your Life*, New York, USA: Vintage.
14. Sengupta, S.S. (2011), Integrating Spirituality and Organizational Leadership, *Integrating Spirituality and Organizational Leadership*, 8, pp. 3-10.



## FOCUS<sub>WTO</sub>.IB

### SUBSCRIPTION RATES

	Single Copy	Annual
Institutions/Individuals	₹300	₹1,000
Booksellers/Agencies	₹255	₹850

Payments for copies/subscription can be made through

(a) Demand Draft/Pay Order/Cheque drawn in favour of "Indian Institute of Foreign Trade" payable at New Delhi, India and to be sent to: Assistant (Publications), Indian Institute of Foreign Trade, B-21 Qutub Institutional Area, New Delhi-110016 Phone: 91-011-39147212 (Direct), 39147200 - 205 (six lines) (extn.: 624) OR

(b) For the purpose of payment through online mode please contact Assistant (Publications) at : [publications@iift.edu](mailto:publications@iift.edu)

## ABOUT IIFT

The history of IIFT began as far back as 1963 when the Government of India established it as a Centre of Excellence in International Trade and Business to help professionalise the country's foreign trade management and increase exports by developing human resources, analysing and disseminating data and conducting research. The Institute visualises its future role as a catalyst for new ideas, concepts and skills for the internationalisation of the Indian economy.

Starting as a think tank for the Government, IIFT moved on by the 1990s to become a business school. In a few years, IIFT established itself as one of the top business schools of India with a special focus on Trade and Finance. The alumni of IIFT are front ranking executives and business leaders and have made the Institute proud with their achievements. IIFT offers its flagship full-time MBA programme, part-time programmes for working executives and training programmes for corporates, PSUs and government officers. It also offers diversified Management Development Programmes tailor-made for working executives of industry apart from numerous certificate programmes of export promotion and foreign languages.

The Institute focuses on three main pillars of academic excellence, namely teaching, research and training. While the flagship MBA programme is extremely well known both nationally and internationally, IIFT also has an expanding research programme with a Ph.D programme (Full time & Part time) which now enrolls scholars from all over the country. Hence, with a strong student, research and alumni base, the Institute is well on its way to pushing the frontiers of knowledge while at the same time maintaining its role as a think tank for the Government.

