

Determinants of Mergers and Acquisitions in Indian Pharmaceutical Industry

Vidhisha VYAS^{*}, Krishnan NARAYANAN^{**}, A. RAMANATHAN^{***}

Abstract

M&A turned out to be significant form of corporate restructuring in post globalization period in Indian industries. The phenomenon is considered to be the most important strategy for gaining competitive advantage for firms. This study attempts to find out the determinants of M&A in Indian pharmaceutical industry. We use the PROWESS database provided by the Center for Monitoring Indian Economy for the period of 2001-2010. The results of the Logit analysis suggests that large and multinational affiliated firms are investing more in M&A activities. Similarly, firms reporting excess capacity and high R&D investments are relying heavily on M&A to restructure and consolidate their position in the industry.

Keywords: Mergers and Acquisitions; Pharmaceutical Industry; Logit Analysis

JEL Code Classification: L65, G34, C23, C25

^{*}Doctoral Student in Economics, Department of H&SS, IIT Bombay, India, e-mail: vidhisha.d.vyas@gmail.com

^{**}Professor of Economics, Department of H&SS, IIT Bombay, India, e-mail: knn@iitb.ac.in

^{***}Professor of Economics, Department of H&SS, IIT Bombay, India, e-mail: ramanath@iitb.ac.in

1. Introduction

The rise of the competition, the financial liberalization allowing capital flows and the rapid technological changes are the basis of the globalization process extensively favoring the influence, presence and participation of foreign owned firms in national economies. This also triggers a lot of corporate restructuring activities of domestic firms. The process has caused a significant reshuffling and redeployment of firm's assets and thereby reshaping of many industrial sectors. The present form of industrial ownership is witnessing strong mergers and acquisitions (M&A) activities around the globe. The phenomenon has tended to facilitate a reconfiguration of firm's organizational structure and its core competencies.

Most of the M&A deals are motivated, by the desire to obtain financial synergies, to gain market power, to obtain access to distribution channel or to gain entry into new geographical locality, thereby admitting that technological reasons do not motivate all M&A. However in the current globalised scenario there are certain high-tech industries where innovation is a key to competitive edge. Such firms will consider the impact of M&A on technological performance even when the deal is not innovation driven; and choose the most appropriate innovation and financial strategy. Technological Knowhow is becoming a key to success in present market and factors such as firm size, history and equity become less and less critical requirement (Gantumur and Stephan, 2007).

The shift in industrial policy in 1991 paved the way for first wave of M&A in India. Policy reforms facilitating M&A begins with the removal of restrictive provisions of Monopolies and Restrictive Trade Practices (MRTP) Act followed by reforms in Foreign Exchange Regulation Act (FERA) in 1993 and Foreign Exchange Management Act (FEMA) in 2000. But at the same time in order to abolish forces which reduce competition, the Competition Policy Act 2002 decided to establish a Competition Commission of India (CCI). This commission aimed at checking the anti competitive activities such as formation of cartels, collusive bidding, and consolidation via M&A which could cause market dominance abuses.

The economic reforms in India have significantly reduced firm level rigidities. Corporate restructuring in recent years is a response to the opportunity provided by policy in order to meet the emerging competitive challenges. The firms, in the process, are reportedly trying to retain competitiveness and increase their value. The rapid growth of Indian economy has encouraged domestic enterprises to undertake more aggressive investment activities which have resulted in a tremendous growth of M&A in the last decade. Domestic firms have taken steps to consolidate their position to face increasing competitive pressures and multinational enterprises (MNEs) from India have taken this opportunity to increase their presence and control in foreign markets (Basant, 2000).

An important feature of M&A activity in India is its sectoral composition. It is interesting to note that firms in the service sector were the pioneers to undertake M&A as a means of expansion globally as well as domestically, later they were joined by Indian manufacturing firms. On international level, the success of service sector had strong positive spillover effect on pharmaceutical sector. Indian drugs firms led the next round of M&A wave to strengthen their position in the regulated overseas markets like the US, Germany and the UK (Pradhan, 2007). Domestically also pharmaceutical sector became a major player in M&A activity. The successful adoption of M&A by software and pharmaceutical firms had all-round effects on Indian firms from other sectors like chemicals, automotive, steel, etc.

Pertaining to the above discussion of M&A activity, it would be interesting to study the structure and behavior of M&A in Indian pharmaceutical industry. The objective of the present study is to find out the key drivers of M&A in Indian pharmaceutical industry. The study attempts to identify firm specific characteristics which affect firm's decision to invest in M&A deals.

The paper is organized as follows. Section two provides an overview of Indian pharmaceutical industry. Section three explains the theoretical background and review of empirical and theoretical studies on M&A determinants. The fourth section describes the data and put forth the foundation for the methodology used in the study. The fifth section of the study deals with the empirical analysis consisting of statistical and econometric study. Last section provides the summary of the findings and the conclusion that can be drawn from the study. This study also tried to provide some policy implications which could further enhance the profitability and competitiveness of Indian pharmaceutical industry.

2. Indian Pharmaceutical Industry: An Overview

Over the past 50 years, the Indian pharmaceutical industry has undergone a massive makeover. They covered the journey from being followers to become strategic partners of MNEs particularly in their drug discovery research and development efforts. The Indian pharmaceutical industry ranked 3rd in the world in terms of production volume (10 percent of global share) and 13th in domestic consumption volume is one of the leading drug industries of developing countries. Over the last 30 years, India's pharmaceutical industry has evolved from almost being nonexistent to a world leader in the production of high quality generic drugs. It has been valued at \$5.3 billion in 2005 accounting for approximately one percent of global pharmaceutical industry. In 1995 when India became member of WTO, its pharmaceutical exports were valued at less than \$600 million which has grown to \$3.7 billion by 2005 and accounts for 61 percent of Industry turnover (Greene, 2007). The latest data specifies that the amount of exports has increased to \$9.1billion. The export of pharmaceutical industry has grown at a CAGR of 14% in last decade (EXIM Bank Report, 2007). Currently India produces 20-22 (in volume) percent of world's generic drug.

At the time of independence in 1947 approximately 99 percent of all pharmaceutical products under patent in India were held by foreign companies and domestic Indian drug prices were among the highest in the world. To encourage domestic production of pharmaceutical products, the government of India established 5 state-owned pharmaceutical companies. At the same time several policy initiatives supported the development of indigenous pharmaceutical industry. The policy and regulatory measures includes- abolition of product patents on food, chemicals, and drugs in 1970. The new patent act allowed only patents for production processes fostering the development of a competitive pharmaceutical industry, making inexpensive drugs accessible to Indian masses. The imposition of price controls on certain formulations and bulk drugs discouraged the foreign participants who later abandoned Indian market making way for the domestic industry. Forty years of protection has enabled this industry to grow significantly and to develop efficiently its research and manufacturing capabilities. The leading companies avail the opportunity to move up in the value added chain. India is leading other developing countries in process R&D capabilities and the range of technologically complex medicines manufactured domestically (Kale and Little, 2007).

According to FICCI (Federation of Indian Chambers of Commerce and Industries)¹, by 2005 there are 20,000 firms operating in pharmaceutical industry and 6,000 firms participating in the formal sector that have received drug manufacturing licenses from the Indian government. The domestic Indian pharmaceutical industry consists of both domestic companies and subsidiaries of MNCs. India's pharmaceutical firms can be well differentiated by size, annual sales, export markets, and R&D capabilities. The largest 250 companies control nearly 70 percent of the domestic market with the top 10 controlling approximately 40 percent (Greene, 2007).

In January 2005, India amended its patent laws governing pharmaceuticals, bringing them into conformance with the WTO TRIPs agreement. Under the new patent law, Indian drug makers can no longer manufacture and market reverse-engineered drugs patented by foreign pharmaceutical firms. This law forced Indian firms to change their business strategies and they focus on the generics market in Europe and the USA, invest more in innovative R&D and target contract manufacturing market. Firms started performing more mergers and acquisitions deals, and form other alliances with domestic and foreign pharmaceutical firms. Nearly 97 percent of India's drug market consists of second-and-third generation drugs no longer subject to patent protection in the developed countries (Kale, 2007). Multinational pharmaceutical firms have entered India after 2005 and using the same resource base as that of Indian firms to compete in the Indian domestic market. This forced Indian firms to make several strategic changes in order to

¹ www.ficci.com

remain competitive in domestic and global market as well as to sustain increasing pressure on profit margins.

The contract research and manufacturing services (CRAM) market presents huge opportunity for the Indian pharmaceutical industry. Indian firms are well equipped to cater for the requirements of outsourcing markets, still India accounts for barely 1.5% of the global CRAM industry. Due to untested patent protection law and lack of data protection MNC firms are reluctant to outsource initial R&D work to Indian firms. It is expected that India will capture around 15 % of CRAM market by 2009-2010 (Greene, 2007). Therefore Indian firms are trying to increase their share in the outsourcing market by moving closer to the market.

Leading Indian pharmaceutical manufacturers: India's leading pharmaceutical companies are facing stiff competition, not only in the domestic Indian market, but also in the global market for both generic drugs and original products. By 2005, 9 of the top 10 Indian drug makers were Indian-owned firms who capture roughly 44 percent of total industry sales (Greene, 2007). India's top five pharmaceutical companies, in terms of sales, are Ranbaxy Laboratories (now subsidiary of Japanese firms Daiichi-Sankyo), Dr. Reddy's Laboratories, Aurobindo Pharmaceutical, GSK-India, and Cipla. These companies manufacture a wide range of generic drugs (branded and non-branded), intermediates, and active pharmaceutical ingredients (APIs).

MNC presence in India: Many of the world's leading pharmaceutical companies have subsidiaries or other operations in India. Multinational companies like GlaxoSmithKline (GSK) Baxter, Aventis, Pfizer, Novartis, Wyeth, and Merck have been active in India's pharmaceutical market mainly through subsidiaries especially after new patent law of 2005.

2.1. Mergers and Acquisitions in Indian Pharmaceutical Industry

Liberalization facilitated Indian firms to market generics drugs to the US and other Western European countries. Indian drug manufacturers currently export their products to more than 65 countries worldwide; the US being the largest customer. At the same time around \$80 billion worth of drugs are moving towards generic way by 2012. For example firms like GSK and Pfizer alone faced seven patent expirations each in 2010. R&D pipeline has been growing weak for the past several years of these large pharmaceutical firms. And many large economies are curbing their health care expenses. Indian pharmaceutical market is changing under the light of the below three arguments (EXIM Bank Report, 2007):

1. Cost effective manufacturing being implemented by developed economies
2. Growing importance of emerging markets
3. Changing significance of India's domestic market

However, Indian firms face some challenges such as non tariff barriers, decreasing profits in the generics market, competitive threats from big pharmaceutical MNEs,

fierce competition from Chinese and Eastern European manufacturers. Indian firms are aiming to move up the value chain by developing capabilities to produce super generics² and branded generics³. Indian companies have realized that to compete with the global pharmaceutical companies, even domestically; will involve new strategies and more innovation.

But India, with advantages of having a large domestic market and having the highest number of US FDA approved plants outside the US which offer a low cost manufacturing base is trying to capture the opportunity through strategic alliances and M&A. Identifying domestic and foreign demand most Indian pharmaceutical companies aimed at expanding their manufacturing capacities mostly by means of M&A. At the same time, Indian companies with the aim to gain competitive advantages have been increasing their R&D expenditure and focusing on building a product pipeline. M&A activities by Indian Pharmaceutical industries are being concluded with the objective of complimenting the strengths of two entities to get market access, new technologies as well as new products. Drive to enhance the size and thereby attaining higher economies of scale could be considered as key motivations for M&A in pharmaceutical sector. According to (KPMG, 2006), it could be mentioned that Indian pharmaceutical firms are pursuing foreign acquisitions with the following goals:

- Improve global competitiveness
- Move up the value chain
- Creation and entry to new markets
- Increase their product portfolio
- Acquire assets (including research and contract manufacturing firms, in order to boost their outsourcing capabilities) and new products
- Consolidate their market shares
- Compensate for continued sluggishness in their home market.

In Indian pharmaceutical industry 264 M&A deals has been undertaken in the given time period of 2001-2010. Out of the total deals number of mergers is 99 (37.5 percent) and number of acquisitions is 165 (62.5 percent). Share of pharmaceutical industry is also highest among all the other industries participating in M&A in manufacturing sector during this period.

Figure 1 shows the year to year fluctuations in number of M&A deals took place during the period of 2001-2010. The figure depicts that the fluctuations are more in terms of acquisitions as compared to mergers. The number of mergers are highest in 2004 (16 deals) and the number of acquisitions are highest in 2008 (29 deals).

² Specialty generic drugs are some time called as super generic.

³ Beginning in late 1992, several producers of drugs with soon-to-expire patents introduced, or authorizing the introduction of, generic versions of their important products just prior to patent expiration. Such products are referred as branded generic or authorized generic drugs

Determinants of Mergers and Acquisitions in Indian Pharmaceutical Industry

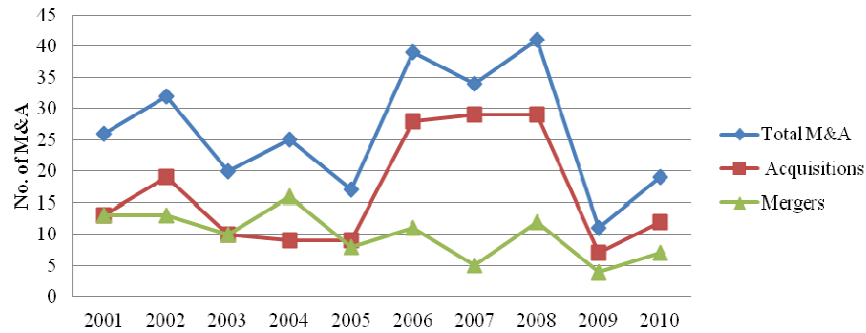


Figure 1: Mergers and Acquisitions in Indian Pharmaceutical Industry for the Period of 2001-2010

Within M&A acquisition activity is undertaken by three different modes:⁴

- a) Substantial acquisition of shares
- b) Minority acquisition of shares
- c) Acquisition of assets

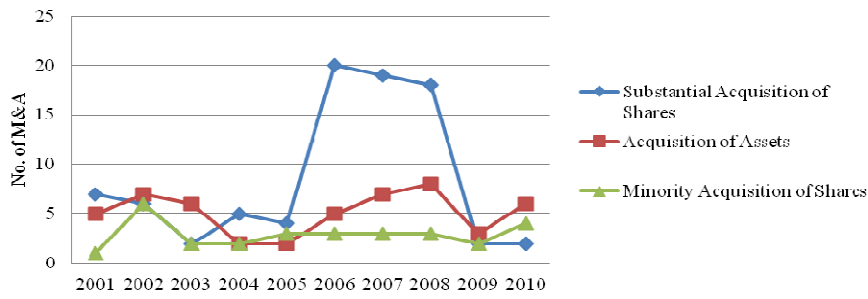


Figure 2: Types of Acquisitions in Indian Pharmaceutical Industry 2001-2010

Figure 2 depicts that in pharmaceutical industry out of the total acquisitions happened in the study period of 2001-2010, 51.51 percent (85 deals out of total acquisitions) are in the form of substantial acquisition of shares while 17.57 percent (29 deals) are in the form of minority acquisition of shares and 30.9 percent (51 deals) are in the form of acquisition of assets. The possible reason behind such type of behavior could be that acquiring substantial shares of the target firm facilitates the change of management control of the firm in the favor of acquirer as compared to minority acquisition of shares which simply provides firm with the voting rights.

⁴ CMIE (Centre for Monitoring Indian Economy) segregates mergers and acquisitions data in the form of substantial acquisition of shares by acquirers (when 15% or more stake is purchased), minority acquisition of shares by acquirers (5% or more shares are purchased), Acquisition of assets (acquire either a brand of the company or one of its plants or divisions or intangible assets) and Merging with another companies.

3. Theoretical Background and Review of Literature

M&A are becoming an important strategy of corporate functioning. This phenomenon existed and was well studied since long in developed countries like the US and those of Europe. A significant amount of literature is dedicated for understanding the post merger performance and consequences. But before finding the impact of M&A it is required to study the motives behind M&A and the factors which facilitate this corporate activity. M&A are driven by different and complex pattern of motives and no single approach can explain them completely.

The motives of M&A could depend upon shareholder's interest as well as on manager's interest and their deviation from shareholders' value maximization approach (Trautwein, 1990). The first motive behind M&A activity could be explained under efficiency theory which supports that M&A are undertaken in order to achieve synergies which includes financial synergies, operational synergies, and managerial synergies.⁵ Financial synergies are the one which lowers the cost of the capital for merged entities. They lower the systematic risk of a company's investment portfolio. Such synergies are generally achieved through unrelated M&A (Singh & Montgomery, 1987). M&A could lead to increase in the size of a firm giving it a better access to capital in comparison to small separate entities. Operational synergies develop by combining operation of two entities leading to economies of scale and scope. Economies of scale can be achieved by having a joint sales force or decrease in production cost or enable firm to offer unique products and services in the market by technology and knowledge transfers (Porter, 1987) but operational synergies are better achieved by the firm which functions in related market i.e. horizontal and vertical deals (Seth, 1990; Singh & Montgomery, 1987).

Another form of efficiency gains in M&A is managerial synergies which can be realized if acquirer's managers possess superior managerial capabilities to monitor and plan which improvise target's performance. But Jensen (1986) argued that managers undertake M&A activity to waste cash in order to avoid shareholders' value maximization. This allows them to increase their control on the firm in comparison to shareholders; therefore Jensen (1986) argues that all M&A do not occur with the motive of promoting efficiency. The empirical evidences in support of or against efficiency argument of M&A are provided by several studies. Ravenscraft and Scherer (1987) emphasized that stock market values mergers as positive event but Seth (1990) analyzed that financial synergies do not create any value in related and unrelated M&A. She also supported the size effect in related acquisition as a source of value and synergy creation. Singh (1987) in his event study analysis distinguish whether related or unrelated acquisitions create value or

⁵ Synergies exist in an acquisition when the value of the combined entity exceeds the sum of the values of the two combining firms.

synergies and confirmed that related acquisition of firms will provide higher returns and assessed that the market recognizes synergistic combinations and values them.

One more motive of M&A could be the strategy of a firm to achieve market power. Though largely, increase in market power is related to horizontal acquisitions but it could be achieved in conglomerate acquisitions as well. Firms can limit competition simultaneously in more than one market by tacit collusion with competitors or by reciprocal dealing and combining business functions.

Literature also specifies the motives of M&A under the empire building theory. This motive specifies that managers try to maximize their utility instead of those of shareholder's. This theory has been widely explained by managerial theories of firm (Baumol, 1959; Marris 1964, Williamson, 1969). Black (1989) postulates that managers are highly optimistic about targets and they overpay for targets as their interest differ from that of stockholders. Ravenscraft and Scherer (1987) also supported the argument of manager's empire building as a motive for M&A. Roll (1986) also asserted the managerial over optimism in hubris hypothesis of M&A. Above description helps to explain M&A motives which are justified by certain empirical evidences from time. After assessing in brief the motives of M&A this would be an interesting aspect to look for the factors that determine M&A activity in a particular industry or in the entire economy as a whole.

The firm's environment evolves over time and firm tries to adapt to this changing environment by modifying its characteristics. The change in firm's characteristics is determined by the strategy chosen by the firm which in turn depends on the capabilities acquired by firm over time. The decision to undertake M&A depends on the various firm's characteristics. Following subsections give an insight of several studies that explain how different firm characteristics affect decision to make M&A investments.

Effect of firm Size: The size of the firm affects firm's decision to invest as well as its performance in many ways. Large firms possess diverse capabilities which provide them the opportunity to exploit economies of scale as well as scope (Majumdar, 1997). According to Penrose (1959) size specific characteristics of firms allow larger firms to perform better as compared to smaller ones. But Shepherd (1986) suggested that size is directly correlated with market power which could develop x-inefficiencies⁶ causing poor performance; therefore size could affect in both positive and negative direction concerning firm's decision to grow.

Indian pharmaceutical industry is highly competitive and has regulated product pricing therefore, efficiency gains generated from large size help firm to increase profit margins which in turn can induce M&A investment. Mishra and Chandra (2010) examined the impact of M&A on financial performance of pharmaceutical

⁶ X-inefficiency is the difference between efficient behavior of firms assumed or implied by economic theory and their observed behavior in practice.

firms of India and found that profitability of firm is directly and significantly related to size. Kumar and Siddharthan (1994) proved a non linear relationship between firm size and export intensity. Higher export intensity could initially generate profit to the firm which provides funds to undertake M&A activity. Danzon et al. (2007) while studying the determinants of M&A in pharmaceuticals and biotechnological firms assumed that if the motive of firm is to achieve economies of scale then smaller firms should actively participate in M&A activity but as against the expectation larger firms measured by enterprise value are actively involved in M&A deals.

Moeller et al. (2004) tried to find relation between firm size and gains from acquisitions and found that small firms perform significantly better when they make acquisition announcement and at the same time large firms have substantial wealth loss when they announce acquisition. They also did not confirm any non-linear shaped relationship between size and gains of acquisition. Large firms also receive negative synergy even by paying larger acquisition premium which is consistent with managerial hubris hypothesis. Duflos and Pfister (2008) studied the technological determinants of acquisitions in pharmaceutical industry and argued that motives for acquisitions would differ in relation to acquirer's and target's size. They found that smaller and larger acquirers use acquisitions to enhance their growth prospects. Dessyllas and Hughes (2005) examined the factors which induce firms to acquire in high technology industry and found that acquiring firms tend to be relatively larger as compared to non acquiring firms having large stock of accumulated knowledge. Lubatkin (1986) also asserted that larger size increases market power and could reduce operating uncertainty and foreign debt costs. The empirical studies of literature suggests that firm size exhibits certain influence on firm's decision to merge and acquire but the relationship has to be determined as it can be linear or non linear.

Effect of Age: Age of the firm represents the experience which firm gained over the period of time. Capacities generated and capabilities gained over a period of time enable firm with the decision making power enabling it to take appropriate investment decision and compete in the market effectively. Older firms have a benefit of learning and can therefore, enjoy superior performance. But at the same time, younger firms are far from inertia and prevented from bureaucratic practices therefore more flexible and responsive to adjust changing economic circumstances (Marshall, 1920). Duflos and Pfister (2008) find in their result that acquiring and target firms in pharmaceutical industry are younger than sample average. Young firms want to grow faster and M&A provide this opportunity to them. Lin et al. (2010) find in the study that patent stock of the firm is associated to business age and more the patent therefore lower incentives to innovate and M&A fill in this void.

Effect of Tobin's q: Andrade and Stafford (2004) postulated that mergers and non merger investments should be increasing in estimates of growth opportunities such

as Tobin's q . Accordingly, whenever the rate of return on a firm's current capital stock exceeds its cost of capital, the value of Tobin's q exceeds unity and firm decides to invest. Duflos and Pfister (2008) got the results of their study asserting that acquiring firms have lower Tobin's q and therefore, such firms lack promising growth prospects. Danzon et al. (2007) also provided evidences that acquiring firms have lower Tobin's q in pharmaceutical and biotechnology industry. On the other hand Jovanovic and Rousseau (2004) explained that firms with high q should acquire lower q firms. Their finding was also confirmed by the studies of Blonigen and Taylor (2000) and Dessyllas and Hughes (2005) who found a significantly positive relationship between firm's probability to merge and Tobin's q . Andrade and Stafford (2004) found that there is no clear relationship between Tobin's q and merger intensity. They further divided data on the basis of high q and low q and found positive relationship between high q value and merger as well as non merger investment and negative relationship between low q and investment activities. Therefore, it could be said that M&A play an expansionary roles and Tobin's q is an important determinant of this corporate activity.

Effect of R&D Intensity: R&D intensity can have both negative and positive impact on firm's probability to undertake M&A decision. Product innovation increases market orientation and process innovation reduces production cost (Mishra and Chandra, 2010). This is feasible if firms undertake in-house R&D expenditure as well as technology acquisition. According to Blonigen and Taylor (2000) high-tech firms choose either between investing in in-house R&D or sourcing technology externally by acquiring innovative firms. But Cohen and Levinthal (1989) developed a concept of absorptive capacity which states that in-house R&D enables the firm to develop capabilities which help firm to assimilate and exploit knowledge from the external environment. At the same time accumulated knowledge from in-house R&D enhances firm's ability to identify suitable targets. Siddharthan (1992) in his study on determinants of in-house R&D found technology import and in-house R&D complementary. Dessyllas and Hughes (2005) in their study find that high-tech industries which are probable of making acquisitions have large accumulated knowledge and low R&D intensity. Danzon et al. (2007) also concluded that firms with high propensity of merging have lower R&D expenditure than those not participating in M&A activity. Duflos and Pfister (2008), Blonigen and Taylor (2000) also confirmed that R&D intensity of firms is negatively associated with propensity to acquire.

Effect of Multinational Affiliation: Globalization promotes the presence of MNEs in various industries. Foreign equity participation has become an important factor determining investment in Indian industries especially like those of telecommunication and pharmaceutical where 100 percent FDI is allowed. MNE affiliation provides firms with the advantages concerning technology, brand names and other intangible assets and thus firms invest more and grow faster. Narayanan (2004) found in his study of automobile sector that the differences in technological sources adopted by the firms determined the growth rate and firms with foreign

equity participation grew faster. At the same time Zelenyuk and Zheka (2006) provide the evidence that there is inverse relationship between firm's efficiency level and foreign ownership. Danzon et al. (2007) explained in the case of pharmaceutical industries that firms with foreign affiliation are more likely to merge in order to access foreign markets and these firms are less likely to be acquired than domestic firms. Beena (2008) argued that foreign affiliation of firms also impact their M&A decision as well as performance. R&D intensity and Export intensity performance was slightly better for domestic industry as compared to those of MNE affiliated.

Effect of Capacity Utilization: Firm and industry level forces motivate firms to undertake M&A activity. Mergers play expansionary⁷ as well as contractionary roles and incentives to expand increase when firm's present capacity is close to exhaustion. Therefore, there is a possibility that both merger and non merger investment are positively related to capacity utilization and if M&A play contractionary role M&A decision should be negatively related to capacity utilization. Andrade and Stafford (2004) at firm level analysis found negative and significant signs on capacity utilization variable thereby confirming that M&A is a tool for restructuring and consolidating firms having excess capacity. But later splitting their sample by decades they found the result that in post liberalization era (1990) the relation between M&A and capacity utilization is positive and sometime significant as well.

According to Danzon et al. (2007) in large pharmaceutical and biotech firms, mergers are motivated by excess capacity as patent expiration and gap in the pipeline drugs make current human and physical capital excessive. M&A provide firms to restructure their asset base. The effect of the variable drug age (measured by percentage of firm's drug that are old and at risk of losing patent protection) in their study is positive and significant which confirms that forthcoming patent expiration and its impact on revenue and labor productivity is a significant motive for firms undertaking M&A. Pandit and Siddharthan (1998) also found that investment decision and expansion of capacity is directly related to firm's technology acquisition.

Effect of Leverage: Capital structure plays a significant role on firm's decision to undertake investment activity. Firms having high leverage will cause under investment (Myers, 1977) or over investment will be dampened in firms having excess free cash flow (Jensen, 1986). Andrade and Stafford (2004) found significant and negative relationship between M&A activity and book leverage. Dessyllas and Hughes (2005) also found negative but insignificant relationship between leverage and M&A probability as high leverage restricts managers to undertake investment activity. Hall (1988) in her study observed that leverage is negatively related to R&D

⁷ Expansionary means mergers are done with a motive of investment which adds to the capital stock of a firm or industry. Contractionary merger facilitates consolidation and reduction of the asset base.

investment even if no merger is involved. Bopkin and Onumah (2009) in their study of determinants of corporate investment decisions found leverage to be negatively and insignificantly related to firm's investment decision.

Effect of Advertisement Intensity: Advertisement intensity is considered as proxy for product differentiation. Firms undertake M&A activity to realize economies of scope and enhance their product portfolio. Diversified product portfolio along with marketing skills enhances firm's competitiveness in global and domestic markets. Siddharthan and Pandit (1998) found positive and significant impact of advertisement intensity on investment behavior of MNEs and large corporate firms in India.

Effect of Profitability: Firms investing higher amounts can replace older capital stock and technologies with superior ones. A firm that saves and reinvest its earning can remain market leader (Brozen, 1951). A firm may either get finance from banks in the form of loan or it can reinvest its profit. But theory of internal financing suggests that taking loan requires firm's long term commitment and can be risky. Therefore firm's generating sufficient cash flow will be able to finance their new investments. Danzon et al. (2007) while studying determinants of M&A in pharmaceutical industry expected positive relationship between cash to sales and acquisitions but later found this relation to be insignificant. Thus, they argued that financing is no constraint on M&A activity. Dessyllas and Hughes (2005) also studying determinants of M&A in high tech industry find profitability to be positively and significantly related to firm's decision to acquire. In Indian context Narayanan (2004) also asserted that in post deregulation period firms reinvest their profits on technological acquisitions. Andrade and Stafford (2004) also noted that profitability doesn't play a significant role in firm's decision on merger investment but it does impact non-merger investment positively.

The above section clarifies that empirical studies have used various firm characteristics to determine the factors affecting M&A decision. In the present study also firm characteristics like age, size, profit, and leverage are included as possible factors which determine inter firm differences in M&A investment decisions. However there is still a lacuna in a way that not many studies have been undertaken in developing economies which tries to find out the firm specific determining factors of a strategic corporate activity like M&A. The limited literature available in developing countries for M&A activity is largely based on post acquisition firm performance. Therefore the current study tries to understand the determinants of M&A in an emerging economy with special reference to pharmaceutical industry.

4. The Data and Methodology

This section presents the data and the methodology used in the analysis. The firm characteristics, their definition and the analytical technique used for the study are

also highlighted. The study uses pooled cross-sectional data, for the period from 2001 to 2010 for Indian pharmaceutical industry. The source of data for the firm characteristics is CMIE Prowess database version 4.0 accessed in the month of September 2011. The number of the firms in each year is in the range of 94 to 138, with a total of 1120 observations for 10 years. The sample size is approximately 21 percent of total industry. Firm specific data on net sales, gross profits, incorporation year, R&D expenditure, advertisement expenditure, market capitalization, secured and unsecured borrowings and MNE affiliation have been collected for the analysis. The factors considered in the study are capacity utilization, MNE affiliation, R&D intensity, Advertisement intensity, Tobin's q, leverage, size, profitability and age of the firm. The methodology adopted is empirical analysis using cross-tabulations and Logit analysis.

The cross-tabulations explain the mean and standard deviations of some of the firm characteristics against the combination of firm's decision to merge or not. Another cross tabulation depicts how the mean and standard deviation of firm characteristics vary with MNE affiliation of the merging and non merging firms. Logit regression is the most appropriate model for this analysis because it is specifically designed to analyze the determinants of discrete dependent variables (Gujarati, 2007 and Andrade and Stafford, 2004). In case of our event the dependent variable is a dummy variable with Merger and Acquisition= 1for M&A event, 0 otherwise. The model used in this study can be explained as:

$$MA = \beta_0 + \beta_1 AGE_{it} + \beta_2 SIZE_{it} + \beta_3 CU_{it} + \beta_4 LEV_{it} + \beta_5 PROF_{it} + \beta_6 RDI_{it} + \beta_7 ADV_{it} + \beta_8 TQ_{it} + \beta_9 MNEA_{it} + u_{it}$$

In Logit analysis MA is regressed against firm characteristics such as age of the firm (AGE), firm size (SIZE), capacity utilization (CU), leverage (LEV), profitability (PROF), R&D intensity (RDI) advertising intensity (ADV), Tobin's q (TQ), and a dummy for MNE affiliation (MNEA). Table 1 describes the variables and their definitions used in the study.

Table 1: Definition of the Variables

Serial No.	Variable	Symbol	Definition of the Variable
1.	Dummy for Merger and Acquisition Deals (Dependent Variable)	MA	Dummy=1 for firms undertaking M&A activity ,0 otherwise
2.	Age of the firm	AGE	Difference between the year in the study and the year of incorporation
3.	Firm Size	Size	Natural log of the net sales
4.	Capacity Utilization	CU	Total sales of the firm /Total assets of the firm
5.	Leverage	LEV	Total borrowings of the firm /Total assets of the firm
6.	Profit Margin	PROF	Gross profit earned by the firm /Net sales of the firm
7.	R&D Intensity	RDI	Expenditure on R&D /Net sales of the firm
8.	Advertising Intensity	ADV	Advertisement expense /Net sales of the firm
9.	Tobin's Q	TQ	Ratio of market value of company's financial claims to the replacement value of capital
10.	Foreign Affiliation	MNEA	DMNEA=1 if foreign affiliation exists, 0 otherwise

5. Empirical Analysis

The present section uses both cross-tabulations and Logit analysis to understand the determinants of mergers and acquisitions in Indian pharmaceutical industry. The first subsection deals with the descriptive data analysis which includes cross-tabulations and correlation matrix respectively. The second subsection gives the econometric model and hypotheses. The third subsection discusses the result of Logit model.

5.1 Descriptive Data Analysis

Table 2 depicts the mean, standard deviation, minimum and maximum values of the non-dummy variables for the sample of 1120 observations. Table 2 explains that mean capacity utilization of the firms in pharmaceutical industry in India is around 84% with maximum utilization by any firm goes up to 327 percent. The firms operating in pharmaceutical industry are quite experienced as the mean age of the firm in the industry is more than two decades with the oldest firm being 109 years old. The mean value of Tobin's q for the entire sample is 1.513 which is more than unity explaining that these firms are in a position to undertake investment activities. The standard deviation of size is also quite high implying that sample contains firms having high as well as very low sales turnover. Around 6 percent of the firm that is 76 out of 1120 has MNE affiliation.

Table 2: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Age (in years)	25.940	18.572	1	109
Size (in Rs. Millions)	835.513	7.381	1.4	63225.94
Capacity Utilization	0.849	0.470	.0162	3.271
Leverage	0.312	0.260	.00004	2.837
Profitability	0.138	0.934	-20.425	13.124
R&D intensity	0.026	0.062	0	1.130
Advertisement Intensity	0.008	0.020	0	0.150
Tobin's q	1.513	1.430	.146	15.144
Dummy for Foreign Affiliation	With foreign affiliation= 76 firms (6%) Without foreign affiliation = 1044 firms (94%)			
Number of observations	1120			

Note: All other variables except age and size are in ratio form. Source: Authors' calculation based on CMIE Prowess database.

As can be observed from Table 3, the mean age of firms participating in M&A activity is much higher than those of non merging firms explaining the fact that firms having more experience participate more in M&A activity. Large size firms are more involved in M&A activity. Leverage mean is lower for merging firms than non merging firms indicating that firms having sound financial structure are more interested in growth via acquisition. Mean of profitability and Tobin's q is also higher for M&A active firms, at the same time standard deviation of profitability is also higher for firms doing M&A deals.

Table 3: Comparison of different indicators for M&A and Non-M&A firms

Variable	Mergers and Acquisitions		No Mergers and Acquisitions	
	Mean	Std. Dev	Mean	Std. Dev.
Age (in years)	31.150	20.542	23.155	16.795
Size (in Rs. Millions)	3012.287	5.401	419.988	6.079
Capacity Utilization	0.768	0.419	0.894	0.489
Leverage	0.287	0.198	0.326	0.288
Profitability	0.211	1.135	0.129	0.262
R&D intensity	0.045	0.085	0.016	0.043
Advertisement Intensity	0.013	0.026	0.005	0.017
Tobin's q	1.953	1.516	1.279	1.325
No. of Observations	391		729	

Note: All other variables except age and Size are in ratio form. Source: Authors' own calculation based on CMIE Prowess database.

The comparison of the firms on the basis of their foreign affiliation is explained in the Table 4. It is interesting to note that mean age and size of the firms doing mergers and acquisitions and have foreign affiliation is much higher than those without foreign affiliation. Profitability of the two types of firms is almost equal but acquiring firms with MNE affiliation has lower book leverage in comparison to those having no MNE affiliation. MNE affiliated firms spend more on advertisement expenditure but their R&D expenditure is slightly lower than that of domestic firms. Investment opportunities represented by Tobin's q is higher for MNE affiliated firm in comparison to domestic firms.

Table 4: Comparison of Foreign and Domestic M&A firms

Variable	Mergers and Acquisitions by firms having foreign affiliation		Mergers and Acquisitions by firms having no foreign affiliation	
	Mean	Std. Dev	Mean	Std. Dev.
Age (in years)	49.015	23.486	27.719	18.038
Size (in Rs. Millions)	6936.052	2.725	2566.399	5.720
Capacity Utilization	1.017	0.550	0.720	0.372
Leverage	0.086	0.134	0.326	0.185
Profitability	0.258	0.154	0.202	1.237
R&D intensity	0.036	0.055	0.047	0.089
Advertisement Intensity	0.033	0.028	0.009	0.024
Tobin's q	2.993	1.120	1.753	1.501
No. of Observations	63		328	

Note: All other variables except age and size are in ratio form. Source: Authors' calculation based on CMIE Prowess database.

Table 5 shows the correlation matrix between the variables used in the study. As seen from the table age is positively correlated to capacity utilization and advertisement intensity. This implies that older firms have better capacity utilization of the resources and spend more on advertisement of products. Size and Tobin's q are also positively related as larger size firms have better investment opportunities. Leverage and profitability have negative correlation as higher the profitability lower is the debt of the firm.

Table 5: Correlation Matrix

Variables	AGE	SIZE	C U	LEV	PROF	RDI	ADV	TQ
AGE	1							
SIZE	0.179	1						
CU	0.337	0.158	1					
LEV	-0.218	-0.072	-0.229	1				
PROF	0.103	0.110	0.009	-0.133	1			
RDI	-0.039	0.176	-0.202	-0.068	-0.045	1		
ADV	0.385	0.168	0.114	-0.199	0.087	0.024	1	
TQ	0.219	0.311	0.003	-0.097	0.048	0.232	0.119	1

Source: Authors' calculation based on CMIE Prowess database.

5.2 Hypotheses for the Logit Analysis

As stated earlier a Logit model has been used to analyze the determinants of mergers and acquisitions in Indian pharmaceutical industry. Firm's experience plays a major role in influencing corporate decisions of strategic importance (Narayanan, 2004; Siddharthan, 1998). The age of the firm determines the experience of the firm and learning by doing behavior. The cross tabulations also show that the mean age of the firm performing M&A activity is higher than those not doing M&A. Therefore we can hypothesize that age of the firm and M&A decision will have positive relationship.

Size of the firm can have positive and negative impact on firm's decision to merge or acquire. Larger size increases market power and could reduce operating uncertainty and foreign debt costs. Size can also help the firm to reap benefits of economies of scale and scope. The present study considers that size would exert positive impact on firm's decision to merge or acquire. As explained by Andrade and Stafford (2004) M&A can have both expansionary as well as contractionary role. Firms can undertake M&A to expand their present capacity or they can take the route of M&A if they have excess capacity. Literature on factors affecting M&A in pharmaceutical industry explains that firms do have excess capacity due to patent expirations or new products in pipeline. Therefore we expect that capacity utilization have direct relationship with M&A decision.

Capital or financial structure influence significantly firm's decision to invest. As explained by Myers (1977) and Jensen (1986) as well as supported by financial constraint literature that firm leverage appears significant factor which determines firm's behavior to invest in M&A activity or not. Keeping in view this argument we hypothesize that leverage and M&A decision will have negative relationship. Profit margins determine the availability of free cash flow with the firm so we can consider that firms with higher profitability have higher probability of performing M&A activity. Another variable which could affect firm's decision to undertake M&A is Tobin's q. It is empirically proved by some literature that Tobin's q and decision to invest has positive relationship because value of q determines firm's growth opportunities (Dessyllas and Hughes, 2005). On the other hand some

studies found negative and insignificant relationship between Tobin's q and M&A decision (Andrade and Stafford, 2004). So, we expect a mixed effect of Tobin's q on M&A deals undertaken by firm.

R&D intensity can have both positive and negative effect on firm's strategy of growth via M&A route. Firms undertaking R&D intensity may not invest in M&A as they have utilized the funds for developing internal technological skills to compete in the market. But at the same time R&D intensive firms by investing more in R&D develop their absorptive capacity for external technology acquisition which can be complementary to their in-house R&D efforts (Cohen & Levinthal, 1989). On the other hand firms not investing on their in-house R&D efforts find M&A route the easiest way of acquiring technology and remain competitive in market.

Advertisement intensity is considered proxy for firm's product differentiation behavior. Higher advertisement expenditure is incurred by firms in order to increase market share of their products. Therefore, more the advertisement investment more is the chance that firms go for M&A deals. This provides them efficiency of scope to develop new product line. Finally various studies have asserted that foreign equity participation as an important factor in determining firm's investment behavior. Therefore a dummy variable that explores the effect of MNE affiliation on firm's decision to undertake M&A deal is included in the equation. It is hypothesized that MNE affiliation would have favorable impact on M&A activity of the firm.

5.3 Logit Results and Interpretation

Table 6 gives the result of Logit model for Indian pharmaceutical Industry. As can be observed from table 6, the log-likelihood value is high and chi-square is statistically significant, therefore the results can be interpreted meaningfully. The coefficient of firm size is positive and statistically significant, implying that firms with large size are undertaking more M&A as they have resources as well as can reap synergies of economies of scale and scope. The findings are consistent with the studies of Lubatkin (1986), Mishra and Chandra (2010) and Dessyllas and Hughes (2005) where they found that acquiring firms are relatively larger in size and size is an important determining factor for M&A activity. With regard to the capacity utilization variable, the coefficient estimate is negative and statistically significant, suggesting that M&A are tools for restructuring and industries undergo consolidation via M&A (Andrade and Stafford, 2004). This result is also consistent with those of Duflos and Pfister (2008) and Danzon et al. (2007) that firms in pharmaceutical industry have excess capacity due to patent expiration and new products in pipeline. Therefore, they take the path of M&A to grow and remain competitive in market.

Table 6: Results of Logit estimation for decision to undertake M&A as explained variable

Variables	Symbols	Coefficient Estimates
Constant	-	-4.005 (-9.99) ^a
Age	AGE	0.005 (1.08)
Size	SIZE	0.622 (12.05) ^a
Capacity Utilization	CU	-1.550 (-6.68) ^a
Leverage	LEV	-0.376 (-1.03)
Profitability	PROF	-0.004 (-0.03)
R&D Intensity	RDI	3.529 (2.68) ^a
Advertisement Intensity	ADV	9.807 (2.50) ^a
Tobin's q	TQ	-0.031 (-0.56)
Foreign Affiliation	MNEA	2.064 (4.82) ^a
	No. of Observations	1120
	L R χ^2 (9)	401.95 ^a
	Log Likelihood	-523.546
	Pseudo R ²	0.27

Values in the parentheses are z-statistics for coefficient estimates. Note: a is at 1 percent significance level. Source: Authors' calculation based on CMIE Prowess database.

The coefficient of R&D intensity is positive and significant which is inconsistent with some of the studies (Ornaghi, 2009), (Blonigen and Taylor, 2000), (Dessyllas and Hughes, 2005) on determinants of M&A in pharmaceutical industries who found that R&D intensity are negatively associated with propensity to acquire. But our result is very robust at 1% significance and goes against the notion that firm might reduce their R&D expenses when going for M&A. Our result suggests that acquisitions are complementary to in-house R&D investment and firms develop a sufficient absorptive capacity while going for acquisition in a high-tech industry⁸ (Cohen and Levinthal, 1989). Positive and statistically significant coefficient has been obtained for advertisement intensity of the firm which confirms the hypothesis that through M&A firms can reap the benefit of economies of scope and can develop new product line with the complementary resource of M&A partners. MNE affiliation coefficient is also positively related as well as statistically significant at 1 percent confirming that MNE affiliation provides firms with the advantages concerning technology, brand names and other intangible assets and thus firms invest more and grow faster. The results are consistent with the literature as Danzon et al. (2007) explained in the case of pharmaceutical industries that firms with foreign affiliation are more likely to merge in order to access foreign markets. Though the sign of the variable depicting leverage is as expected (negative) but the results are not statistically significant. This result is consistent with those of Dessyllas and Hughes (2005).

Coefficient of Tobin's q is also negative emphasizing that pharmaceutical acquiring firms lack promising growth prospects (Duflos and Pfister, 2008) but results are statistically insignificant, therefore we cannot conclude the effect of Tobin's q on

⁸ According to OECD Classification pharmaceutical industry is a high-tech industry.

firm's decision to acquire. The variable age have positive coefficient indicating that firm's experience matter in investment decision but again the results are statistically insignificant. Profitability is also having negative coefficient showing that less profitable firms tries to improve their performance by acquiring other efficient firms but hypothesis remains inconclusive as results are statistically insignificant. This shows that for Indian pharmaceutical industry financial characteristics are not impacting firm's decision to invest and expand via M&A path.

6. Summary and Conclusions

The present study analyzes M&A activity in pharmaceutical industry and its determinants in the context of a developing country, namely India. An extensive literature review suggests that in post liberalization period M&A has become a tool for corporate restructuring. The foremost motive of firms undertaking M&A activity is net addition to its physical and capital assets. M&A activity could be largely explained by factors that motivate firms to grow and expand and it is considered as faster and efficient way to expand firm's asset base and productive capacity. Further the study has examined the determinants of economic activity of strategic importance. Some important points revealed from this study are relevant in context to Indian pharmaceutical Industry is:

1. In Indian pharmaceutical industry both cross tabulations and Logit analysis suggests that firms undertaking M&A activity are larger in size as compared to non M&A active firm. These findings suggests that small firm are unable to expand due to limited availability of resources, at the same time larger firms have resources to invest on multiple capacity expansion as well as technological expansion. Therefore, the government should facilitate consolidation of smaller firms in the industry so that firms in this industry can have opportunity to expand and compete efficiently in the generic as well as specialized drug market.
2. Cross tabulations results show that R&D expenditure for industry as a whole is just 2.6 percent and minimum is zero. This suggests that very few firms are undertaking pioneering R&D activities in the industry. The restrictive policies of Indian government before liberalization era created a large technological gap between Indian and western firms. The Logit results show that R&D intensity has positive relation to M&A. This could imply that in-house R&D is complementary to technology acquisition via M&A route in a high tech industry like pharmaceutical. Therefore government needs to formulate R&D inductive policy as well as help firms in identifying upcoming streams where R&D efforts of the firms could be directed. This will help firm to develop their own knowledge stock as well as to have comparative advantage in global market.

3. Around 6 percent of the firms participating in M&A activity have foreign affiliation and Logit analysis reiterates that MNE affiliation impact positively firm's decision to participate in M&A. Post liberalization economic policy facilitated foreign investment in the economy and allows 100 percent FDI in pharmaceutical industry. But further investigation is required to understand the exact nature and impact of M&A deals by MNE affiliated.
4. It is evident from the cross tabulation that average utilization of firm's capacity is around 84 percent. Therefore, firms in pharmaceutical sector required high amount of investment to continue production as well as to remain competitive by continuous up gradation of technology and capital assets. The government can facilitate better funds availability to this industry and formulate policy for better pricing of pharmaceutical products leading to generation of higher profits and cash flow.

Thus the present study, with the help of cross-tabulations and Logit analysis brought to light interesting facts about M&A in Indian pharmaceutical industry. Following the recent deregulation policy in 1990s and important amendment to Indian Patent Act in 2005, this study tried to enrich the literature concerning the M&A activity in pharmaceutical industry. This analysis tried to predict that M&A play important economic roles. M&A provide an opportunity to the firms to increase their asset base, on the other hand it facilitate industry consolidation. In pharmaceutical industry firms have excess capacity due to pipeline products and patent expiration of certain drugs inducing firms to go for M&A in order to remain profitable and competitive in the market. The positive and significant sign on R&D intensity and advertisement intensity specifies that M&A are undertaken for generating economies of scale and scope.

There is a scope to improve the present analysis by looking into the role of cross border M&A deals as well as the impact of type of mergers in determining the factors driving M&A in this particular industry. At the same time it would be interesting to find out impact of new product patent regime on M&A, as this particular development can enhance innovation and restrict competition in pharmaceutical market. Further the study could be extended to other high-tech industries which give us a scope for rigorous comparisons and generalizations. Nevertheless the analysis presented here provides a good insight into the factors that drive firms to undertake M&A in one of the leading industries in an emerging economy.

References

- Andrade, G. and Stafford, E. (2004) "Investigating the Economic Role of Mergers." *Journal of Corporate Finance* 10: 1-36.
- Basant, R. (2000) "Corporate Response to Economic Reforms." *Economic and Political Weekly*, 35(10): 813-822.

- Baumol, W.J. (1958) "On the Theory of Oligopoly." *Economica* 25: 187-98.
- Beena, P.L. (2008) "Trends and Perspectives on Corporate Mergers in Contemporary India." *Economic and Political Weekly* 43(39): 48-56.
- Black, B. (1989) "Bidder Overpayment in Takeovers." *Stanford Law Review* 41: 597-632.
- 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." *The Journal of Industrial Economics* 48(1): 47-70.
- Bokpin, G.A., and Onumah, J. M. (2009) "An Empirical Analysis of the Determinants of Corporate Investment Decisions: Evidence from Emerging Market Firms." *International Research Journal of Finance and Economics* 33: 134-141.
- Brozen, Y. (1951) "Invention, Innovation, and Imitation." *American Economic Review* 41(2): 239-257.
- Centre for Monitoring Indian Economy (CMIE), Prowess 4.0 Database Online Accessed on September 2011.
- Chatterjee, S. (1986) "Types of Synergy and Economic Value: The Impact of Acquisitions on Merging and Rival Firms." *Strategic Management Journal* 7(2): 119-139.
- Cohen W. M. and Levinthal D. A. (1989) "Innovation and Learning: The Faces of R&D." *The Economic Journal* 99 (397): 569-596.
- Danzon, P.M., Epstein, A., Nicholson, S. (2007) "Mergers and Acquisitions in the Pharmaceutical and Biotech Industries." *Managerial and Decision Economics* 28 (5): 307-328.
- Dessyllas, P. and Hughes, A. (2005) "R&D Patenting Activity and Propensity to Acquire in High-Tech Industries." Working Paper No. 298, ESRC Centre for Business Research, University of Cambridge.
- Duflos, G. and Pfister, E. (2008) "Searching for Innovations? The Technological Determinants of Acquisitions in the Pharmaceutical Industry." CES Working Papers, Centre d'Economie de la Sorbonne, Paris, series 2008.57.
- Gantumur, T. and A. Stephan (2007) "Mergers & Acquisitions and Innovation Performance in the Telecommunications Equipment Industry." *Electronic Working Paper Series, CESIS*, no.111.
- Greene, W. (2007) "The Emergence of India's Pharmaceutical Industry and Implications for the U.S. Generic Drug Market." Office of Economics Working Paper, U.S. International Trade Commission.
- Gujarati, D. N. and Sangeetha (2007) *Basic Econometrics (Fourth Edition)*, New Delhi: McGraw-Hill, Inc.
- Indian Pharmaceutical Industry: Surging Globally (2007), Occasional Paper No. 119, Export-Import Bank of India. Retrieved on December 1, 2011 from <http://www.eximbankindia.com/op/oplast.pdf>.
- Jensen, M. (1986) "Agency Costs of Free Cash Flow, Corporate Finance and Takeovers." *American Economic Review* 76: 323-329.
- Jovanovic B. and Rousseau P.L. (2002), *The Q-theory of Mergers*, Working Paper, NYU.

- Kale, D. and Little, S. (2007) "From Imitation to Innovation: The Evolution of Innovative R&D Capabilities in the Indian Pharmaceutical Industry." *Technology Analysis and Strategic Management* 19 (5): 589-609.
- Kale, D. (2007), "Internationalization Strategies of Indian Pharmaceutical Firms." IKD Working Paper No. 23, The Open University, UK.
- KPMG Report (2006), *The Indian Pharmaceutical Industry : Collaboration for Growth*. Retrieved on November 30, 2011 from <http://www.in.kpmg.com/pdf/indian%20pharma%20outlook.pdf>.
- Kumar N. and N.S. Siddharthan (1994) "Technology, Firms Size and Export Behavior in Developing Countries: The Case of Indian Enterprises." *Journal of Development Studies* 31 (2): 289-309.
- Lin, J., Huang, C., Liu, H. (2010) "A Matching Approach to M&A, R&D: Evidence from Taiwan's Listed Companies." *International Journal of Electronic Business and Management* 8 (4): 282-291.
- Lubatkin, M. (1986) "Mergers and The Performance of The Acquiring Firm." *The Academy of Management Review* 8: 218-227.
- Majumdar, S. (1997) "The Impact of Size and Age on Firm-Level Performance: Some Evidence from India." *Review of Industrial Organization* 12 (2): 231-241.
- Marris, R.L. (1964) *The economic Theory of Managerial Capitalism*. London: Macmillan.
- Marshall, A. (1920), *Principles of Economics*, 8th Edition. London: Macmillan.
- Mishra, P. and T. Chandra (2010) "Mergers, Acquisitions and Firms' Performance: Experience of Indian Pharmaceutical Industries." *Eurasian Journal of Business and Economics* 3(5): 111-126.
- Montgomery, Cynthia A. and Singh, H. (1984) "Diversification Strategy and Systematic Risk." *Strategic Management Journal* 5: 181-191.
- Moeller, S.A., Schlingemann, F.P., Stulz, R.M. (2004) "Firm Size and Gains from Acquisitions." *Journal of Financial Economics* 73: 201-228.
- Myers, S. (1977) "Determinants of corporate borrowing." *Journal of Financial Economics* 5: 147- 175.
- Narayanan, K. (2004) "Technology acquisition and growth of firms: Indian automobile sector under changing policy regimes." *Economic and Political Weekly* 39 (5): 461-470.
- Ornaghi, C. (2009) "Mergers and Innovation in Big Pharma." *International Journal of Industrial Organisation* 27: 70-79.
- Penrose, E.T. (1959) *The Theory of the Growth of the Firm*. London: Blackwell.
- Porter, M.E. (1985) *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press.
- Porter, M. E. (1987) "From Competitive Advantage to corporate strategy." *Harvard Business Review* 65 (3) 43-59.
- Pradhan, J. P. (2007) "Trends and Patterns of Overseas Acquisitions by Indian Multinationals." Working Paper No. 10, ISID, New Delhi.
- Ravenscraft, D. and Scherer, F.M. (1987) "Life after Takeovers." *Journal of Industrial Economics* 36 (2): 147-56.

- Ravenscraft, D.J., Scherer, F.M., (1987) "Mergers Sell-offs and Economic Efficiency." The Brookings Institution, Washington, DC.
- Roll, R. (1986) "The Hubris Hypothesis of Corporate Takeovers." *Journal of Business* 59: 197-216.
- Seth, A. (1990) "Value Creation in Acquisitions: A Re-examination of Performance Issues." *Strategic Management Journal* 11: 99–115.
- Shepherd, W. G. (1986) "On the Core Concepts of Industrial Economics", in H.W. De Jong and W. G. Shepherd, eds, *Mainstreams in Industrial Organization*. Dordrecht: Martinus Nijhoff Publishers.
- Siddharthan, N.S. (1992) "Transaction Costs, Technology Transfer, and In-house R&D: A Study of the Indian Private Corporate Sector." *Journal of Economic Behavior and Organization* 18: 265–271.
- Siddharthan, N.S., Pandit, B.L. (1998) "Liberalization and Investment: Behavior of MNEs and Large Corporate Firms in India." *International Business Review* 7: 535–548.
- Trautwein, F. (1990) "Merger Motives and Merger Prescriptions." *Strategic Management Journal* 11 (4): 283-295.
- Zelenyuk, V. and Vitaliy Z. (2006) "Corporate Governance and Firm's Efficiency: the Case of Transitional Country, Ukraine." *Journal of Productivity Analysis* 25: 143-168.
- Williamson, O. E. (1964) *The Economics of Discretionary Behavior*. NJ: Prentice-Hall, Englewood Cliffs.
- World Investment Report, (2010) *Investing In a Low Carbon Economy*. UNCTAD.