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Mergers, Acquisitions and Firms' Performance: Experience of Indian Pharmaceutical Industry

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Abstract

In the context of policy reforms in the 1990s in general and three important amendments made to the Indian Patent Act (1970) in 1999, 2002 and 2005 in particular, the present paper makes an attempt to examine the impact of MA on financial performance of Indian pharmaceutical companies. It is found that the profitability of a firm depends directly on its size, selling efforts and exports and imports intensities but inversely on their market share and demand for the products. However, MA do not have any significant impact on profitability of the firms in the long run possibly due to the resultant X-inefficiency and entry of new firms into the market. In addition, in-house R&D and foreign technology purchase also do not have any significant impact on profitability of the firms.

Keywords: *Mergers, acquisitions, pharmaceutical, patent, India*

JEL Classification Codes: *D21, D4, L1, L2*

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1. Introduction

Introduction of deregulatory policy measures in general and competition policies in particular since 1991 have resulted in a significant increase in the number of mergers and acquisitions (MA)[1] in Indian corporate sector (e.g., Khanna, 1997; Venkiteswaran, 1997; Chandrasekhar, 1999; Roy, 1999; Basant, 2000; Beena, 2000, 2004 & 2008, Das, 2000; Kumar, 2000; Agarwal, 2002; Dasgupta, 2004; Mishra, 2005; Agarwal and Bhattacharya, 2006; Mantravadi and Reddy, 2008). While majority of these deals are horizontal in nature (Khanna, 1997; Beena 2000 & 2008; Mishra, 2005), the number vary significantly across the industries (Basant, 2000; Das, 2000; Dasgupta, 2004; Agarwal, 2002; Mishra, 2005). The broad industry groups that experienced a large number of MA include financial and other services, chemicals including drugs and pharmaceuticals, electrical machinery, electronics and beverages including spirits and vinegars, etc. (Basant, 2000; Das, 2000; Agarwal, 2002, Mishra, 2005)[2].

There are two broad theories explaining why firms acquire other firms or merge with other firm. The monopoly theory postulates that the firms use the route MA to raise their market power (Steiner, 1975, Chatterjee, 1986), whereas, according to the efficiency theory, MA are planned and executed to reduce costs by achieving scale economies (Porter, 1985; Shelton, 1988)[3]. Either way firms are expected to have better financial performance following MA. Many of the existing studies (e.g., Healy et al. 1992; Grabowski et al., 1995; Switzer, 1996; Waldfogel and Smart, 1994; Vander, 1996) empirically support the proposition that MA lead to better financial performance of the firms. Contrary to this, there are also studies (e.g., Dickerson et al., 1997; Ravenscraft and Scherer, 1987a and 1987b; Mueller, 1985; Ghosh, 2001) that report results at odds with the view that MA improve corporate performance. Further, Ikeda and Doi (1983), Cosh et al (1984), Kumar (1984), Geroski (1988), Odagiri (1992) also find either such negative results or little changes in operating performance following MA.

Thus, the existing studies report mixed impact of MA on financial performance of the firms, with the findings ranging from slightly positive improvement to significantly negative or no improvement. This raises an important question; has the wave of MA in the post-reform era helped Indian firms in improving their financial performance? While addressing this question is very important to understand the implications of the wave of MA, the research on financial

[1] Although mergers and acquisitions are different in their definitions and the statutory procedures, their effects from an economic perspective are the same as in both the cases the control of one company passes on to another. So, in the present paper, no distinction is made between the mergers and the acquisitions.

[2] The incidence was, however, much less in the industries like wood and wood products, paper and paper products, electricity, construction activities, etc (Basant, 2000; Mishra, 2005).

[3] These scale economies may arise at the plant level (Pratten, 1971) or as a result of operating several firms within one firm (Scherer et al., 1975). In either case, MAs bring together firms, which individually fall short of the minimum efficient scale.

performance following MA in India so far is very limited. Besides, although most of these existing studies (e.g., Pawaskar, 2001; Beena, 2004; Mantravadi and Reddy, 2008) find decline or very little increase in post-merger profitability, their empirical testing is based on either small sample of deals (e.g., Pawaskar, 2001) or shorter time-frame (e.g., Beena, 2004). A small sample fails to capture adequately the variations in impact of MA, especially, when the sample is drawn from diverse product groups/industries (e.g., Mantravadi and Reddy, 2008). A shorter timeframe, on the other hand, undermines the process of adjustment and the conclusion on impact therefore may be misleading. Further, a better understanding of the impact of MA on financial performance also requires controlling for the influence of various structure, conduct (other than MA) and policy related variables, which is missing in the existing studies.

In this perspective, the present paper makes an attempt to examine the impact of MA on financial performance of pharmaceutical companies with a sample of 52 firms over the period of 2000-01 to 2007-08 by using the multi-directional structure-conduct-performance-policy relationships. The reasons for selecting pharmaceutical industry are of many folds. First, drugs and pharmaceutical industry appears to be one of the most active sectors in the game of MA accounting for about 8.6 per cent of total mergers and 11.6 per cent of total acquisitions in the 1990s and majority of these MA were horizontal in nature (Mishra, 2005). Second, the wave of MA in Indian pharmaceutical industry did not help the firms much in raising their market share[4]. This contradicts with the basic proposition of the monopoly theory that the firms use the route MA to raise their market power (Steiner, 1975, Chatterjee, 1986)[5]. But, as a large number of deals in the industry were guided by the motives of business consolidation and strengthening R&D bases, the firms may be benefited through efficiency gains.

Third, since the market remain highly competitive despite the wave of MA, Mishra (2006) infer that MA have very little impact on performance of Indian pharmaceutical industry, rather performance of industry is determined mainly by the extent of market concentration, import competition, marketing expenses and technology strategies by the firms. However, such inference on causal linkages between MA and performance is not empirically verified.

Finally, the Pharmaceutical Policy (2002) is expected to ensure availability of abundant good quality and essential drugs, strengthening indigenous capabilities and quality control system, creating a framework to encourage new investment

[4] Although the industry recorded a considerable increase in market concentration in the 1990s mainly due to its low base, the level of concentration is still very low as compared to what is observed in many other industries, leaving the market structure highly competitive (Mishra, 2006).

[5] In fact, the structure of Indian pharmaceutical market seems to be determined largely by a set of conduct (other than MA), performance and policy related variables, in addition to various demand-supply related market conditions and horizontally differentiated product structure (Mishra, 2006).

and new technologies, increasing exports by reducing barriers to international trade, and encouraging R&D compatible with the country's needs particularly in the context of the commitment regarding TRIPS Agreement[6]. This coupled with delicensing of the sector, removal of a large number of drugs from price control, and three important amendments to the Indian Patent Act (1970) by the parliament before TRIPS became effective in 2005, viz., Patent First Amendment Act in 1999, Patent (Second Amendment) Bill in 2002 and Patent (Amendment) Bill in 2005 have made a marked shift from the process patent regime towards an era of product patent.

The rest of the paper is organized in the following way: Section II specifies the functional model applied in the present paper and discusses the possible impact of MA on firms' performance controlling for that of other variables. Section III deals with the methodology and the data used. Section IV analyses the empirical results and Section V concludes the paper.

2. Specification of Functional Model

The impact of MA on financial performance of the firms can be examined by using the structure-conduct-performance (SCP) framework. The traditional SCP paradigm, based on the early work of Edward Mason (1939) and developed further by Bain (1959), postulates a unidirectional relationship between market structure, conduct and performance. However, the successive developments in the industrial organization literature have resulted in multidirectional structure-conduct-performance-policy relationships (Scherer and Ross, 1990). In the new framework, the causal relationships amongst structure, conduct and performance are not necessarily be unidirectional. Instead, dual causalities between structure and conduct, between conduct and performance, and between structure and performance are very likely. Another important development in the modern SCP paradigm is inclusion of public policies relating to taxes, subsidies, international trade, investment, etc. Further, the relationships may not necessarily be instantaneous in nature (Kambhampati, 1996) and there may be lagged relationships amongst many of the constituent variables.

Seen in this line, let us assume that current profitability ($PROF_t$) of a firm is a function of its current size (FSZ_t), current market size (MSZ_t) current market share ($SHARE_t$), lagged mergers and acquisitions (MA_{t-1}), lagged selling intensity ($SELL_{t-1}$), lagged R&D intensity (RD_{t-1}), lagged foreign technology purchase intensity ($FTECH_{t-1}$), current export intensity (EXP_t), and current import intensity (IMP_t), i.e.,

$$PFOR_{it} = \alpha_1 + \alpha_2 FSZ_{it} + \alpha_3 MSZ_{it} + \alpha_4 SHARE_{it} + \alpha_5 MA_{i,t-1} + \alpha_6 SELL_{i,t-1} + \alpha_7 RD_{i,t-1} + \alpha_8 FTPI_{i,t-1} + \alpha_9 EXP_{it} + \alpha_{10} IMP_{it} + u_{it}$$

[6] For the details, see, Pharmaceutical Policy 2002, IDMA Bulletin, 21 February 2002.

Here, MSZ_t is used as a proxy for demand for the firms' product. On the other hand, FSZ_t, $SHARE_t$ and IMP_t stand for structural aspects of the market, MA_{t-1}, $SELL_{t-1}$, RD_{t-1}, $FTECH_{t-1}$, EXP_t and IMP_t for firms' conducts and EXP_t for their performance. In addition, MA_{t-1} is also likely to capture changes in investment policies in general and competition policy in particular. Similarly, EXP_t and IMP_t are also expected to capture the impact of trade related policy changes on performance of the firms. Further, the present paper uses two alternatives measures of profitability, viz., the ratio of profit before interest and taxes to sales (PBIT) and the ratio of profit after taxes (PAT) to sales to substantiate the findings.

2.1. Possible Impact of the Independent Variables

Current Firm Size (FSZ_t): Firm size is generally hypothesized to have a positive impact on profit rates due to scale economies and other efficiencies associated with large-firm size (Hall and Weiss, 1967; Scherer, 1973; Majumdar, 1997). In a competitive market like Indian pharmaceutical industry with little difference in market share and availability of large number of alternatives, efficiency gains from being larger in size help a firm to raise its profitability. This is particularly so as the prices of a number of medicines are still controlled.

Current Market Size (MSZ_t): As pointed out earlier, in the present paper current market size of a firm is used as a proxy for the demand for its product. It is expected that the firms with greater market demand will have greater profitability. However, when firms reduce prices to raise market demand for their products or restrict entry, they may not necessarily experience greater profitability.

Current Market Share ($SHARE_t$): The basic theory of industrial economics suggests that high market share raises profitability. However, such a positive relationship between market share and profitability may not be so straight forward. Feeny and Rogers (1999) find a U-shaped relationship between market share and profitability. This may be so when the objective of the firm is to grow in size through greater market penetration. In this case, higher market share may be a consequence of lower prices charged by the firm. Further, higher market share may encourage entry of new firms or results in X-inefficiency of the existing ones. So, in the long run, market share may not have any significant impact on profitability. For example, McDonald (1999) fails to find any significant relationship between profitability and market share of Australian manufacturing firms.

Mergers and Acquisitions (MA_{t-1}): According to the efficiency theory, MA are planned and executed for reducing costs by achieving scale economies (Porter, 1985; Shelton, 1988). The monopoly theory, on the other hand, considers MA as the routes to raise market power (Steiner, 1975, Chatterjee, 1986). Therefore, one may expect MA to help the firms to improve their financial performance through greater market power and efficiency gains. However, in addition to MA, market power of a firm may also be influenced by number and size distribution of firms in

the industry, entry of new firms into the market, extent of import competition, expansion of the market, etc. Further, whether a merger or an acquisition will lead to greater market power may also depend on the motive of the particular synergy. If, for example, a merger or an acquisition is motivated by more efficient operation rather monopoly power, it may not lead to increase in market concentration (Banerjee and Eckward, 1998). Similarly, monopoly power arising out of a merger or an acquisition may result in X-inefficiency. This means that, when controlled for other factors, a merger or an acquisition may not necessarily improve financial performance of the firms.

Lagged Selling Intensity ($SELL_t$): Selling efforts by a firm that include advertising, marketing and distribution may raise its profitability in a number of ways. On the one hand, advertising can help the firm to have image advantage over the rivals. Advertising can also create entry barriers. Comanor and Wilson (1967) hypothesize that industries with high advertising expenditures have high product differentiation barriers to entry[7]. The Comanor-Wilson hypothesis has been tested extensively resulting in a positive relationship between profitability and advertising to sales ratio (Scherer and Ross, 1990). On the other hand, firms also spend heavily on distribution and marketing activities to gain increased market shares, with a consequent impact on profitability (Majumdar, 1997). Thus, product differentiation and image advantage through advertising, coupled with creation of marketing and distribution related complementary assets are expected to improve the financial performance of a firm. In other words, higher the selling intensity of a firm in any year, greater the profitability is likely to be in the next year.

Lagged R&D Intensity (RD_{t-1}): Product innovations through in-house R&D efforts strengthen and extend market orientation while process innovations reduce the cost of production. Sustained innovation may also act as an important instrument of maintaining entry barriers (Mueller, 1990) and thereby resulting in higher profitability in the long run. Cefis (1998) confirms that the firms that are persistent innovators continue to innovate and earn above average profit. However, in the absence of effective regulation, the extra profit due to innovation may diminish when the competitors start to imitate the products and the processes of the innovative leading firms. This coupled with the current accounting practices that allow firms to express R&D expenses entirely in the year incurred instead of amortizing it to recognize its future benefits creates the possibility of negative impact of in-house R&D on - profitability -.

Lagged Foreign Technology Purchase Intensity (FTP_{t-1}): Acquisition of new technology helps a firm in lowering operating costs and hence the price (Hinomoto, 1965; Balcer and Lippman, 1984). It may, therefore, be assumed that acquisition of foreign technology raises the profitability of a firm by modifying the level and

[7] High advertising intensity may require the potential entrants to incur disproportionately high advertising expenses to win over the incumbents and this may discourage entry.

composition of its productive capacity, reducing per unit production costs and enhancing demand. Greater access to foreign technology not only enhances competitive edge of the firm in the market place, but also helps it in creating strategic entry barriers. Firms may purchase foreign technology or they may have access to the same through licensing, foreign investment and mergers and acquisitions.

Current Export Intensity (EXP_t): Although there is no specific theory, per-se, which links the export-orientation of firms to performance, one may expect the impact of exports on observed performance of firm to be positive (Majumdar, 1997). This is particularly so when the competition intensity differs between the domestic and the international marketplace. Larger penetration through exports in the international market is backed by greater competitiveness and also provides the domestic firm opportunities to operate at optimal scale, especially, when domestic demand constraints are present. This helps a firm to reduce its costs of operations and hence to raise profitability.

Current Import Intensity (IMP_{t-1}): With greater penetration of imported goods, a firm can raise its market share and hence profitability. Further, higher import intensity of a firm may also pressurize others to perform better (Majumdar, 1997), and failure in this regard may force many of the incumbents to exit the market raising profitability of the existing firms. Therefore, one may expect a positive impact of import intensity on the profitability of a firm. However, the existence of a quota system and import licensing, which has been the case in India may engender rent-seeking and make the impact of imports on profitability negative.

3. Methodology and Data

The above equation is estimated by applying panel data estimation techniques for a set of 52 listed drugs and pharmaceutical companies over the period from 2000-01 to 2007-08. Use of panel data not only helps in raising the sample size and hence the degrees of freedom considerably, it also incorporates the dynamics of firms' behavior in the marketplace. This is very important in having a better understanding of complicated issue like the impact of MA on financial performance of firms. Necessary data on all the variables are collected from the PROWESS database of Centre for Monitoring Indian Economy (CMIE), Mumbai.

We estimate both the fixed effects model (FEM) and the random effects model (REM). While in the FEM the intercept is allowed to vary across the firms to incorporate special characteristics of the cross-sectional units, in REM it is assumed that the intercept of an individual is a random drawing from a large population with a constant mean value (Gujarati and Sangeetha, 2007). In other words, in REM the intercept of an individual unit is expressed as a deviation from the constant

population mean. Therefore, the choice between the FEM and the REM is very important as it largely influences conclusion[8].

In the present paper, we apply the test developed by Hausman (1978) to decide between the FEM and REM. The test is based on the null hypothesis that the estimators of FEM and REM do not differ significantly and uses a test statistic that has an asymptotic $\chi 2$ distribution. When the null hypothesis is rejected, the FEM is better suited as compared to REM. Further, the decision made on the basis of Hausman test is verified by using Breusch and Pagan (1980) Lagrange Multiplier test for testing random individual effects, if any. The test is based on the null hypothesis that the variance of the random disturbance term is zero and uses a test statistic that follows $\chi 2$ distribution. Rejection of the null hypothesis suggests that there are random effects in the relationships.

4. Empirical Results and Analysis

Table 1 gives summary statistics of the variables used in the estimated model. Table 2 and Table 3 represent the regression results of the two estimated models by using PBIT and PAT respectively as the dependent variable. It is observed that the F-statistic in FEM and the Wald $\chi 2$ in REM are statistically significant. Further, the R2 value is reasonably high in FEM and it is very high in REM. This indicates that both the estimated models are statistically significant with high explanatory power. However, as mentioned in the earlier section, in order to select between the FEM and REM, the present paper applies the test developed by Hausman (1978).

Table 1: Summary Statistics for the Variables used in the Regression Model

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
PBIT	260	38.16	121.19	-120.64	1212.57
PAT	260	24.95	85.22	-140.55	844.37
MA	260	0.78	1.25	0.00	7.00
SELL	260	14.71	32.75	0.00	354.48
RD	260	2.66	4.23	0.00	31.16
FTP	260	0.15	0.97	0.00	13.27
MSZ	260	4.38	2.35	-1.92	8.06
SHARE	260	1.92	2.94	0.00	16.20
FSZ	260	4.11	2.23	-2.18	8.20
EXP	260	21.54	25.62	0.00	123.97
IMP	260	20.86	47.96	0.00	457.78

The test statistic as presented in Table 2 and Table 3 are not statistically significant. This means that the estimates of REM are appropriate as compared to that of FEM

[8] This is so because when the number of cross-sectional units is large and the number of time-series units is small, as it is in the present case, the estimates obtained by the FEM and REM can differ significantly (Gujarati and Sangeetha, 2009).

in the present context. Further, the Breusch-Pagan $\chi 2$ test statistic is also statistically significant indicating randomness of the relationships. We, therefore, use the regression results of the REM for testing the statistical significance of the individual coefficients as well as for their interpretation.

White's heteroscedasticity consistent standard errors are used to compute z-statistics of the individual coefficients. This makes the regression results robust, as these standard errors control for heteroscedasticity. It is observed that the coefficients of FSZ, SHARE, MSZ, SELL, EXP and IMP are statistically significant. Further, while the coefficients of SHARE and MSZ are negative that of FSZ, SELL, EXP and IMP are positive. This implies that the firms with larger demand for their products or larger share in the market have lower profitability. On the other hand, the firms that are larger in size or that make greater selling efforts or have higher exports and imports intensities experience higher profitability.

Table 2: Regression Results with PBIT as the Dependent Variable

Fixed Effects Model			Random Effects Model		
Variable	Coefficient	t-Stat	Variable	Coefficient	z-Stat
Intercept	138.2138	1.32	Intercept	-15.4494	-1.20
FSZ	40.7814	2.11**	FSZ	27.0706	2.40**
SHARE	-7.9332	-1.35	SHARE	-3.4810	-2.24**
MSZ	-67.7423	-1.69***	MSZ	-23.0511	-2.16**
MA	-1.9850	-0.84	MA	3.4304	1.28
SELL	2.2170	3.14*	SELL	2.6386	4.02*
RD	-5.6641	-2.26**	RD	-2.4374	-1.26
FTP	-4.8933	-0.64	FTPI	-7.6865	-0.99
EXP	1.1666	2.50**	EXP	0.4720	2.28**
IMP	0.1864	0.96	IMP	0.2858	1.72***
F-Statistic		8.49	Wald χ^2		169.57
R^2-Within		0.76	R^2-Within		0.73
R^2-Between		0.33	R^2-Between		0.85
R^2-Overall		0.40	R^2-Overall		0.81
No. of Observations		260	No. of Observations		260
Hausman χ^2					3.32
Breusch-Pagan χ^2					75.72

*Statistically significant at 1 percent.
**Statistically significant at 5 percent.
***Statistically significant at 10 percent.

It is interesting to note that the coefficients of MA, RD and FTP are not statistically significant. This means that mergers and acquisitions in Indian pharmaceutical firms do not have any statistically significant impact on their financial performance. Similarly, in-house R&D efforts or purchase of foreign technology also do not influence firms' financial performance in a significant way.

Table 3: Regression Results with PAT as the Dependent Variable

Fixed Effects Model			Random Effects Model		
Variable	Coefficient	t-Stat	Variable	Coefficient	z-Stat
Intercept	71.7654	0.87	Intercept	-20.4236	-1.81***
FSZ	27.7219	1.88***	FSZ	19.3612	2.28**
SHARE	-8.0098	-1.62	SHARE	-3.3430	-2.58**
MSZ	-40.9989	-1.29	MSZ	-14.6181	-1.71***
MA	-1.9273	-1.12	MA	2.4565	1.18
SELL	1.5109	2.88*	SELL	1.7741	3.75*
RD	-3.9907	-2.17**	RD	-1.3290	-0.90
FTP	-4.1717	-0.75	FTPI	-6.0874	-1.11
EXP	1.0372	2.90*	EXP	0.3894	2.48**
IMP	0.1139	0.79	IMP	0.2055	1.75***
F-Statistic		8.49*	Wald χ^2		169.57*
R^2-Within		0.76	R^2-Within		0.73
R^2-Between		0.33	R^2-Between		0.85
R^2-Overall		0.40	R^2-Overall		0.81
No. of Observations		260	No. of Observations		260
Hausman χ^2					4.34
Breusch-Pagan χ^2					75.34*

*Statistically significant at 1 percent.

** Statistically significant at 5 percent.

***Statistically significant at 10 percent.

The empirical results presented above suggest that profitability of a firm depends inversely on its market share. Firms with larger market share experience lower profitability in the long run[9]. This may contradict to the general perception that larger market share results in higher profitability, but is not surprising. A firm may experience lower profitability despite having greater market share due to the entry of new firms into the industry and X-inefficiency of the incumbents[10]. The firms with larger share in the market may enjoy higher profitability in the short run, which may encourage new firms to enter into the industry. In the long run, absence of legal entry barriers and failure of the incumbents to create strategic entry barriers make entry of new firms possible[11] and thereby reduce profitability of the incumbents. Similarly, when firms raise market demand for their products by reducing the prices, they may not necessarily experience greater profitability. In other words, a firm with greater demand for products in the market may experience lower profitability.

[9] This finding contradicts with Delorme et al (2002).

[10] Using dynamic panel data model Mishra (2008) observes that the traditional positive concentration-markup relationship does not hold in a dynamic context when controlled for various structural aspects of the market, firms' strategies and policies of the government.

[11] According to Chaudhuri (2005), the success of one Indian company in a field often induces the entry of other Indian companies in the same field.

The larger firms are found to record higher profitability possibly due to scale economies and other efficiencies associated with large-firm size. This is quite consistent with Hall and Weiss (1967), Scherer (1973) and Majumdar (1997). Thus, in a competitive market like Indian pharmaceutical industry with availability of large number of alternatives and controlling of prices of many of the drugs, efficiency gains from larger size is very important for a firm to raise its profitability.

The firms with greater selling efforts experience larger profitability through information dissemination, product differentiation, and easy movement of the products and better reach to the consumers. This is consistent with Robinson (1933), Kaldor (1950), Bain (1956) and Comanor and Wilson (1974), though contradicts with Greuner et al. (2000) and Delorme et al. (2002). Similarly, firms with greater intensity towards exports and imports of final products are found to record higher profitability. Such a positive association of profitability with exports and imports intensity is consistent with Majumdar (1997).

Technology strategies of the firms in the form of either in-house R&D or purchase of foreign technology do not influence their profitability in a significant way. This may largely be due to the low R&D as well as foreign technology purchase intensity of most of the pharmaceutical companies operating in India. Further, purchase of obsolete technologies and failure in innovating new products or processes also restrict the firms from raising their profitability.

Interestingly, MA does not have any statistically significant influence on profitability of Indian pharmaceutical companies. In other words, firms do not necessarily benefit from MA in terms of profitability in the long-run, which is largely in the line of observations made by Ikeda and Doi (1983), Cosh et al (1984), Kumar (1984), Geroski (1988) and Odagiri (1992) that either confirm negative results or find little changes in operating performance following MA. However, the observation of no statistically significant influence of MA on profitability contradicts with the findings of Healy et al. (1992), Grabowski et al. (1995), Switzer (1996), Smart and Waldfogel (1994) and Vander (1996) that MA improve corporate performance. The contradiction may largely be due to multi-directional structure-conduct-performance-policy relationships used in the present paper. As pointed out by Scheerer and Ross (1990), MA as business strategies influence firms' financial performance either by enhancing operational efficiency or raising market power. But, strategic reactions of other firms or policy intervention of the government may limit the benefits through MA. Further, many of the firms use the route of MA to consolidate their business/operation or to increase scale of operation for enhancing their competitiveness in the market. When it is so, MA may not necessarily have significant influence on firms' profitability[12.]

[12] In Indian context, using a sample of - public limited and traded companies between 1991 and 2003, Mantravadi and Reddy (2008) find- that there are minor variations in terms of impact on operating

5. Conclusions and Policy Implications

In the context of introduction of large-scale deregulatory policy measures in the 1990s in general and three important amendments made to the Indian Patent Act (1970) in 1999, 2002 and 2005 in particular, the present paper makes an attempt to examine the impact of MA on financial performance of Indian pharmaceutical companies. It is found that the profitability of a firm depends directly on its size, selling efforts and exports and imports intensities but inversely on their market share and demand for the products. In other words, firms larger in size or having greater selling efforts or higher presence in the international market or larger proportion of imported goods in the selling basket experience greater profitability. On the other hand, the firms with greater demand for products or larger dominance in the domestic market record lower profitability in the long-run. However, MA do not have any significant impact on profitability of the firms in the long run possibly due to the resultant X-inefficiency and entry of new firms into the market. In addition, in-house R&D and foreign technology purchase also do not have any significant impact on profitability of the firms.

Thus, Indian pharmaceutical firms fail to reap the benefits of MA in terms of profitability. In other words, MA in Indian pharmaceutical industry are not necessarily counterproductive and detrimental to the interests of the consumers. Rather, MA may benefit the firms in enhancing their competitiveness and thereby facing acute competition from the MNCs. This in turn ensures consumer welfare. Improvement in efficiency and competitiveness is reflected in large number of acquisition of foreign firms abroad by Indian pharmaceutical companies. The findings of the present paper, therefore, raise an important question, is there any necessity to regulate MA in Indian pharmaceutical industry? In other words, should there be uniform thresholds of assets and turnover in regulating MA across industries, especially when the combinations are not detrimental rather beneficial to consumers' interests? More importantly, should there be any flexibility in the competition law for objective-specific assessment of MA? Addressing these questions in future research is very important, particularly for Indian pharmaceutical industry, as the new product patent regime may encourage innovation and restrict competition in the marketplace.

Finally, in-house R&D fails to provide any distinct advantage to the firms in terms of their profitability. This may largely be because of their low R&D intensity vis-à-vis the pharmaceutical companies of the industrially developed countries operating in India. Therefore, the very basic question is, can introduction of product patent law

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performance following mergers in different industries in India. In particular, while mergers seem to have had a slightly positive impact on profitability of firms in the banking and finance industry, the pharmaceuticals, textiles and electrical equipment sectors saw a marginal negative impact on profitability and returns on investment. For the chemicals and agri-products sectors, mergers had caused a significant decline, both in terms of profitability and returns on investment and assets.

be enough to encourage the firms towards in-house R&D? If not, what should be the policy measures to encourage in-house R&D in a greater way in Indian pharmaceutical industry? This is very important, as there are serious doubts on the positive impact of patents on R&D[13] and alternatives are being talked about. A comprehensive pharmaceutical policy should address these issues adequately and, therefore, requires further research in this line.

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