What motivates mergers and acquisitions? An industry level analysis

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Abstract: We examine the recent patterns and determinants of mergers and acquisitions at industry level in India over 15- year period, from 1998 - 2012. With different motives expected behind intra and inter industry mergers, and between the manufacturing and service sector, we examine the merger motives for both, intra industry as well as inter industry mergers, in the two sectors, separately. Our results show that mergers are concentrated in industries and in time. In both the sectors- manufacturing and services, acquirers are targeting firms within and outside the industry, to expand and improve their position in less concentrated industries. Additionally, firms in the manufacturing sector are also merging within the industry to strengthen themselves against the foreign players, and outside the industry, to expand their operations.

1 Introduction

The volume of Mergers and Acquisitions[1] (M&A) in India has experienced an unprecedented upsurge in the post economic reforms period. The number of mergers , which was as low as 15 in 1988, rose to 144 in 1993 and has increased rapidly since then to cross the 2000 mark in the year 2005 (Kaur, 2012). Thus, there has been a fourteen-fold rise in the number of mergers transactions over the 12 years' period. In terms of value, proxied by the share of paid up capital of firms that are involved in the merger activity in the total paid up capital of manufacturing sector, the merger transaction has risen from mere 1.03% in 1990-91 to 3.54% in 1994-95. The trend gained momentum since the year 2000 and reached the level of 14.16% in 2005-06 (Beena, 2014).These statistics provide an estimate of how rapidly the mergers and acquisitions have been rising in India.

Merger activity is expected to be stimulated by financial gains that can arise from economies of scale, diversification, reduced duplicative costs and technological complementarities etc. But mergers may also be driven by incentives to enhance market power, which allows firms to exploit anti-competitive gains and benefits producers at the cost of consumers' welfare. An important question of concern that arises is, whether the substantial merger activity is motivated by operating synergistic gains or anticompetitive gains. Thus, it is imperative to understand the motives behind the merger activity.

The existing empirical literature on the determinants of mergers has particularly focused on developed countries, which document the clustering of mergers at industry level and underline the importance of various industry level factors in determining merger activity. Mitchell and Mulherin (1996) show the industry level clustering of mergers in the U.S. during 1982 – 1989 and explain that clustering is an adoption of industry structure in response to any expected or unexpected industrial shock like deregulation, financing innovations and increased foreign competition. Andrade and Stafford (2004) document industry shocks and industrial capacity utilisation as significant factors in explaining the clustering of mergers in the 1970s, 1980s and 1990s, for the U.S. Harford (2005) studies merger activity in the U.S. industries during 1980s and 1990s and finds that merger activity is initiated by shocks, which could be economic, regulatory or technological. However, he argues that the shock driven merger activity results in a merger wave only when sufficient liquidity is available in the capital market.

Cortes, Agudelo and Mongrut (2012) highlight industrial profitability as significant factor affecting the merger activity in Argentina, Brazil, Chile, Colombia, Mexico and Peru in the period 1993 – 2010. Aktas and Declerck (2015) provide the evidence that reduction in import tariffs has intensified mergers in the U.S. between 1985 and 2005.

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[1] Henceforth, the terms - "mergers" or "merger activity" have been used for "mergers and acquisitions".

However, the motives to merge depend enormously on certain factors which are country specific like government regulations, corporate laws and the state of development of capital market etc. Therefore, the merger incentives could be expected to differ significantly across countries. For India, the empirical evidence on determinants of mergers at industry level is very limited. Agarwal and Bhattacharjea (2006) identify clustering of merger activity at industry level from 1973-74 to 2002-03, and at firm level, show delicensing and the MRTP amendments to be significant factors influencing merger activity in India. Agrawal and Sensarma (2007) examine the determinants of mergers for the period 2002 – 2004 and show that mergers in India are motivated by growth and consolidation motives. The sharp increase in the merger activity in India since 1990s and the limited existing literature at the industry level, emphasize the need to further delve into the motives of merger activity comprehensively to get its better understanding.

Thus, with this aim, our study attempts to assess the clustering and significant determinants of merger activity at industry level in India. Intra and inter-industry mergers could be expected to have different motives. Intra industry deals, where the target and acquirer firms belong to the same industry, might be driven by restructuring motives, for instance, in response to excessive competition from foreign firms or to remove duplicate costs. On the other hand, inter industry deals, wherein acquirer and target firms are from different industries, might be driven by technological complementarities or diversification motives. Also, the nature of the two sectors - manufacturing and service sector is very different, which indicates towards the possibility of different factors motivating mergers in the two sectors. These divisions have been overlooked in the literature. In this backdrop, we investigate the determinants of intra and inter-industry mergers individually. Further, owing to the different nature of manufacturing and service sectors, we examine the intra as well as inter industry motives in these two sectors, separately.

The merger activity has been analysed by occurrence and value of mergers. That is, we have first considered the factors that motivate mere occurrence of a merger, followed by investigating the factors that determine the intensity of merger activity, as measured by their values, across industries.

In brief, consistent with the findings of literature, we find that mergers are concentrated in industry and in time. In both the sectors, manufacturing and services, they are more likely to occur in less concentrated industries. Additionally, in the manufacturing sector the probability of occurrence of merger in also high in profitable and technology intensive industries.

Similarly, the intensity of mergers, intra as well as inter-industry, in the two sectors is observed to be higher in less concentrated industries. In fact, in service sector, merger intensity is seen to be higher in less concentrated industries only. On the other hand, in the manufacturing sector, besides concentration level, foreign competition is also inducing substantial intra industry merger activity; and high profits and sales growth are leading to

substantial inter industry merger activity. It implies that in manufacturing sector, acquirers are targeting firms within and outside the industry to enhance their operations and thus improve their position in the market. Further, they are merging within to brace up against the foreign competition and outside to expand and diversify their business. On the other hand, in service sector, firms are undertaking intra as well as inter industry mergers to expand and be competent in the industry.

The rest of the paper is structured as follows. Section 2 describes the data set and section 3 examines the clustering activity of mergers. Section 4 discusses the empirical model and methodology, respectively. Section 5 presents the results, which is then followed by the conclusion in section 6.

2 Data

The data source used for this study is Prowess, considered to be the most recognised and reliable source of data on Indian industries. In the first place, a dataset on mergers and acquisitions is constructed for the period 1996 – 2012. Since the information on the merging firms is available since 1996 in Prowess, the starting period for my analysis is chosen to be 1996.

Prowess captures deals under four sub headings: acquiring assets, substantial acquisition of shares, minority acquisition of shares and mergers. We have considered only two sub heads - "substantial acquisition" and "mergers", as only these two categories imply change in control over the company, while other two categories do not. Further, we excluded the deals where any of these event names appeared: "buy-backs", "promoter", "rights issue" , "inter-se-transfer", "joint venture break up" and "preferential allotment" as these events do not imply change in control over the company.

Prowess records a deal in the year in which it comes to know about it, but not in the year in which the transaction actually gets completed. So, we re-arranged the deals according to the completion year. For the acquisition deals for which completion details are not given, we tried to assure the completion of such deals by looking at the information in Prowess on equity holders of the target companies. But the detail of equity holders is provided by Prowess from 2001 onwards and that too, not for all the companies. Thus, for rest of the deals we assumed that they got completed. To be assured of the completion of such merger deals, we confirmed that the last financial year in which the merged company has submitted its financials should precede the effective year of merger, because the merged company ceases to exist after the merger, and thus, the last year in which the merged company submitted its financials cannot be after the merger. Further, if same acquirer and target companies are involved in M & A for two consecutive years then we have captured them only once, that is, in the year in which the deal got finally completed.

We identified a total of 5360 merger and substantial acquisition deals over the entire sample period of 17 years, from 1996 - 2012. For the clustering analysis, NIC 2008 industry

classification at two digit level is being followed to identify the industries the merging companies belong to. For almost half of the deals, NIC code of either acquiring or target company is missing in Prowess. We considered Ace Equity, Thomson Reuters, Bloomberg and Manish Agarwal's database[2] to fill in the missing codes. Variation in codes across different data sources and across time within the same data source is also found. 1085 deals remained with the acquirers' codes missing and hence, a total of 4275 deals are analysed for examining the trends of mergers and acquisitions.

The econometric analysis is carried out at three digit industry level using the same NIC 2008 industrial classification. Thus, for the estimations, the merging companies are allocated to the industries at three digit level. Also, the econometric analysis has been done since 1998 because the annual financials of the firms is available from 1998 in Prowess.

For the purpose of estimation, a total of 5254 merger deals are identified, at three digit level, for the 15-year period, from 1998 – 2012. Out of these 5254 deals, 1410 deals sometimes do not have information on either of the merging companies or they remained with acquirer's NIC code missing or are involved in diversified activities and thus, could not be included in the study. From the subset of deals where the target firms could also be allocated to the industries, we identify 1445 deals as intra industry deals and 1956 deals as inter industry deals. An important point to note here is that an intra-industry deal or an inter-industry deal can be horizontal, vertical or conglomerate. We have just focussed on intra/ inter analysis but not the product[3] level analysis.

Data on "deal value' was not exactly available. Therefore, in order to estimate the value of a merger, each merger is assigned a "deal value" based on the total assets of the target firm. We also use Capitaline and Ace Equity databases to fill in the missing information in Prowess on total assets of target firms. Out of 3401 deals, 1665 deals remained with missing information on total assets of the target firms. Effectively, 744 and 992 deals are considered while estimating intra-industry and inter-industry merger intensity by value of mergers.

Further, the industries for which less than 10 firms are covered over the entire time period are aggregated at two digit level and if the number of firms still remains less than 10 over the entire period even after the aggregation at two digit level, then such industries are excluded from the study. The sample represents 117 industries where 10 industries are taken at two digit level. Each industry is followed over the period 1998 – 2012, that is, our sample

[2] Manish Agarwal has used a far-reaching database on mergers extending over a thirty-year period, from 1973-2002. I am thankful to Manish Agarwal for sharing his database with me.

[3] Product analysis involves classifying merger deals by horizontal (merger of two firms involved in the business of same product), vertical (merger of two firms engaged at different stages of production, i.e., having buyer or seller relationship) or conglomerate mergers (merger of two firms involved in business of unrelated products). This is not feasible without detailed information on the product portfolios of each firm, and the degree of competition between the products of different firms.

includes a balanced panel of 117 industries for 15 years. The entire analysis has been done from the perspective of the acquirer.

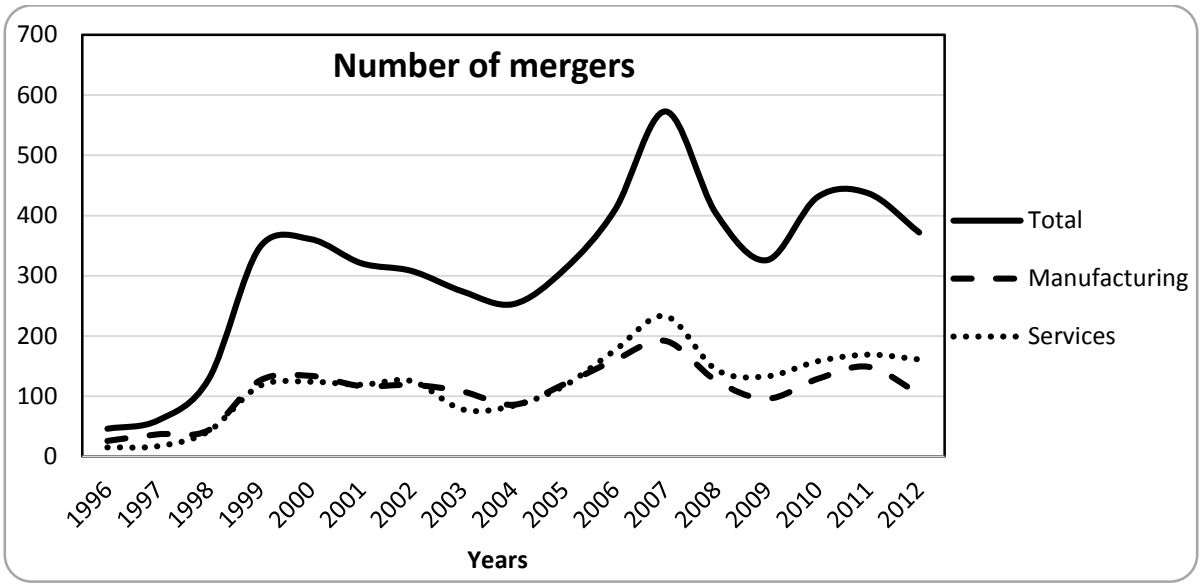
3 Clustering Analysis of Merger Activity

Three features of clustering have consistently been observed in the literature about mergers and acquisitions (Mitchell and Mulherin (1996); Andrade and Stafford (2004); Agarwal and Bhattacharjea, (2006); Cortes, Agudelo and Mongrut, (2012); Florian Szucs (2013)). One, mergers occur in waves; two, they are concentrated in industries and the last being the concentration of mergers in time for a given industry. These features are consistent with the proposition that industry shocks play an important factor in driving merger activity.

Wave pattern of mergers: In this section, we try to testify these three facts about mergers in India. Our results are consistent with the existing literature. Figure 1 shows that mergers have occurred in waves in India. First wave of moderate intensity extends from 1996 to 2004 and another wave of relatively high intensity extends from 2005-09. Further, the nature of waves of mergers remains consistent in manufacturing as well as in service sector, as shown in Figure 1.

Figure 1:trend

Figure 1: Number of mergers during the period 1996 - 2012



Clustering in industries: To identify the second feature of clustering which argues that mergers are concentrated in few industries, we calculated the percentage of total merger activity that is accounted for by top 10 and top 5 merger intensive industries, consistent with the work of Andrade and Stafford (2004); Agarwal and Bhattacharjea, (2006) and Okoeguale,

(2012). The higher the proportion of merger activity accounted for by top 5 and top 10 industries, the higher is the industrial clustering of mergers.

Table 1 shows that top 10 industries, out of 64 industries where mergers occurred during the period 1996 – 2012, account for 58 – 61% of total merger activity, that is, they account for more than half of the total merger activity and top 5 industries account for 40 – 46% of total merger activity, over the entire time period and the two sub periods of moderate (1996-2004) and high (2005-09) intensity merger wave.

Similarly, from 21 manufacturing industries where merger activity has taken place, top 10 industries account for 74 - 78% of total merger activity and top 5 industries account for 47 - 50% of total merger activity over the entire sample period and two sub periods. Likewise, in the class of 30 industries in the service sector, top 10 industries in service sector alone account for 84 - 86% of total merger activity and top 5 industries account for 71 - 74% of total merger activity for all time periods considered. Therefore, in both the sectors in India mergers are concentrated in few industries only.

During 1996 - 2012, within manufacturing sector, mergers are concentrated in chemicals, pharmaceuticals, machinery, basic metals and food products industries. Within service sector, financial industry reported the highest number of mergers followed by computer programming, wholesale trading, real estate activities and telecommunications. Further, in both the sub periods (1996-2004 and 2005-09) as well, all these manufacturing and service sector industries accounted for high merger activity.

Table1. : Percentage of merger activity accounted by top 5 and top 10 industries:

Time Period	Top 5 (Number)			Top 10 (Number)		
	All Industries	Manufacturing	Services	All Industries	Manufacturing	Services
1996 – 2012	45.98	47.24	70.67	58.04	74.46	84.79
1996 – 2004	43.18	50.27	74.15	61.61	78.11	85.09
2005 – 2009	39.76	46.64	71.74	57.53	75.84	86.60

Clustering in time: Further, to analyse the clustering of mergers in time, following Mitchell and Mulherin (1996) methodology, we find the maximum proportion of merger deals occurring in any adjacent three year period over the entire sample period, for each industry. The higher proportion of merger activity occurring within the three year period indicates a higher concentration of mergers in time for the selected industry.

Our data shows that 20 out of 64 industries have undertaken at least 50 per cent of their merger activity in just three years. For most of these industries, the three years window lies

in the period 2005 – 2009, which is the sub- period observed with relatively higher intensity merger wave. Similar clustering of mergers in time is observed for manufacturing as well as service sector, separately. In just one-fifth of the sample period (three years), 13 industries in the service sector are observed to have undertaken at least half of the merger activity and 9 industries in the manufacturing sector have undertaken one third of their merger activity.

However, as mentioned by Powell and Yawson (2005), this method of analysing time clustering of mergers will bias the results. For example, if in an industry only three mergers have occurred consecutively over the entire sample period then the selected period of adjacent three years would account for 100% of merger activity for that particular industry. On the other hand, if in an industry 139 mergers have occurred over 17 years but the maximum number of mergers is only 50 when we consider adjacent three year period then the selected period would account for only 35.9% of merger activity. Therefore, to overcome this issue of bias, we have done a more formal chi square test to examine the variation in timings of merger activity across industries; as is done by Mitchell and Mulherin (1996); Powell and Yawson (2005) and Agarwal and Bhattacharjea (2006). It tests the equality of pooled sample variance with the weighted average of the variance of all industries (Johnston, 1984, p. 298). The null hypothesis is that there is no variation in timings of merger activity across all sub samples.

The Table 2 below shows p-values of chi – square test. The p-value is 0.00 for the entire sample, as well as for both the sectors when considered individually, and for all the time periods considered. It indicates significant time clustering of mergers across industries in both the sectors in India.

Table 2: Chi Square test for testing clustering of mergers in time

Time period	**p-value**		
	All Industries	**Manufacturing Sector**	**Service Sector**
1996- 2012	0.00	0.00	0.00
1996-2004	0.00	0.00	0.00
2005 – 2009	0.00	0.00	0.00

To summarize, we find that mergers in India, are clustered in industries and in time and the findings remain consistent within both manufacturing and service sector. The literature on advanced economies states that clustering of mergers is a result of industry shocks. In the subsequent section, we try to find out the possible reasons for clustering of mergers in India.

4 Econometric Model and Methodology:

This section explains the econometric model that has been analysed in this study to examine the possible reasons behind mergers at industry level.

The data indicates that there are many industries that have not experienced a single incidence of a merger during the 15-year period from 1998 – 2012. Thus, we have analysed merger activity by occurrence, in the first place. We identify the factors that lead to mere occurrence of merger in a given industry. Following which we study the merger activity by value. That is, we investigate factors that determine the merger intensity across industries. We have defined the merger activity, which is the main outcome variable, in following two ways:

1) Occurrence of mergers– it is a dummy variable, taking value one if merger occurs in a given industry in a given year, otherwise zero, and

2) Merger intensity – it is defined as the sum of the total assets of all target firms in a given industry in the financial year just preceding the merger (t-1), scaled by the total assets of all the firms in that industry in that year (t-1). Andrade and Stafford (2004) have argued that scaling is useful in two ways: first - it will help to make comparisons across time and industries; and second, since investment is aimed at replacing depreciated assets with the new assets, therefore, scaling the investment by some measure of the capital stock is natural.

Owing to the distinct nature of the two dependent variables, different econometric methodologies have been used. For modelling "occurrence" of mergers, we use logit model which is appropriate for binary dependent variable.[4] For estimating "value" of mergers, tobit model is implemented because the intensity measure is censored at zero and tobit model is designed to account for such censoring.

In order to consider all the possible factors that can affect the merger intensity, the following explanatory variables at industry level are included. These industry level ratios are created by aggregating firms over numerator and denominator which makes these ratios "value-weighted" ratios (Andrade and Stafford, 2004).

Along the lines of literature, demand shock is proxied by using two year sales growth of an industry. It is argued that firms' revenues are monotonically related to the state of demand (Bernile et al (2012)). Sales growth is deflated by Wholesale Price Index (WPI). WPI is extracted from Ministry of Statistics and Programme Implementation (MOSPI), where it is given product wise with corresponding product level weights. We calculated WPI of an industry by taking the weighted average of the price indices of the products that can be included in that industry. Splicing is also done to create a common base year across the series. Mathematically, sales growth for a given industry i at time t is calculated as:

$SG_t = [(Sales_t / WPI_t) / (Sales_{t-2} / WPI_{t-2})] - 1$

The literature (Lambrecht and Myers (2007), Mason and Weeds (2010)) asserts that mergers are motivated by both, positive as well as negative, demand shocks. During the positive

[4] Probit can also be used for binomial dummy variable. See Kaur (2012) Pg. 313 for justification of logit over probit.

shocks, mergers allow the expansion of operations and facilitate exploitation of production synergies; while during recessions, they allow contraction of the asset base. Mitchell and Mulherin (1996), Andrade and Stafford (2004) and Harford (2005) document a significant relation between the industry shocks and merger activity.

In a recent theoretical study, Bernile, Lyandres and Zhdanov (2012) argue a step further, that the predicted relation between the demand shocks and mergers, is driven by horizontal (intra industry) merger activity. On the basis of strategic interactions among the incumbent firms while making a decision to merge, in the presence of a threat of a potential entrant, their theory predicts a U-shaped relationship between the industry demand and intra- industry merger activity.

Thus, to examine the significance of shocks, we take sales growth (SG) and squared value of sales growth, from now on will be referred as "salesgrowthsquare" (SG^2), as explanatory variables. Higher merger activity during the periods of shocks implies that the sign of the coefficient of salesgrowthsquare should be positive. Additionally, according to Bernile, Lyandres and Zhdanov (2012) model, which proposes the U-shaped relationship between the industry demand and intra- industry merger activity, the sign of the coefficient of salesgrowthsquare should be positive, specifically, in the intra-industry estimations.

Concentration level (CONC) of industries is included to account for the differences in industry structure. On one hand, firms within the high concentrated industries merge to exploit monopoly gains and on the other hand, firms belonging to less concentrated industries may involve in mergers to expand their operations and stay competent. The sign of the coefficient of concentration will be positive in the former case, while it will be negative in the latter. Concentration level is measured by creating a dummy variable that takes value one for highly concentrated industries and zero for less concentrated industries. For each industry, the median value of Herfindahl index (HHI) is calculated for the entire time period. Then the industries are partitioned into highly concentrated or less concentrated by looking at whether their median value of HHI is above or below the median value of all the medians calculated in step 1.

Q theory suggests that all forms of investment must increase with the increasing q. Therefore, to encapsulate the effect of growth opportunities across industries, we include TOBINQ. It is calculated by adding total assets and market equity less book equity and dividing the resulting value by total assets. Its coefficient is expected to be positive.

To take into account a measure of industry profitability, we include return on assets (ROA). It is defined as a ratio of profits after tax to total assets. It is expected to affect the merger intensity positively.

We also consider a ratio of R&D to sales (R&D) and ratio of licensing and royalty fees to sales (TECHINT), to capture the technology and knowledge intensive nature of the industries and hence, to explore if industries exposed to more technological innovations experience

higher merger activity or not. Technological innovations that create economies of scale encourage intra industry mergers and innovations that create economies of scope encourage inter industry mergers. Thus, the coefficients are expected to have positive signs.

The effect of foreign competition faced by an industry is also controlled to analyse if the higher intensity of foreign competition encourages mergers, as it is believed that domestic firms may involve in mergers to brace up for the competition from foreign firms. We take two proxies to measure the degree of foreign competition present in a given industry. First, import penetration ratio (IMPORTS) is included, which shows to what degree domestic demand is satisfied by imports. It is calculated as a ratio of the value of imports as a percentage of total domestic demand and is defined only for manufacturing industries. The data on imports and exports is taken from MOSPI. Concordance of products is done at NIC three digit level. Second, Foreign Direct Investment (FDI) has been controlled for, which is defined as a ratio of sum of total assets of firms having multinational affiliation to the total assets of the given industry. The coefficients of both the variables are expected to be positive.

We also include the industry capacity utilisation rates (CU), as firms belonging to the industries having high capacity utilisation rates may involve in merger activity to expand and firms belonging to the industries having excess capacity might involve in merger activity to consolidate and reduce asset base. It is measured as a ratio of sales to book assets. The variable is defined only for manufacturing industries. This variable is expected to have a positive sign if mergers are undertaken to expand and expected to have a negative sign if mergers are undertaken to contract.

On the basis of above discussion, we estimate the following econometric model to investigate the determinants for mergers by occurrence and value, at industry level.
For a given industry i, in year t:

$$\begin{aligned}\text{Mergerintensity}_{it} &= \beta_1 + \beta_2(\text{SG})_{it-1} + \beta_3(\text{SG})^2_{it-1} + \beta_4(\text{CONC})_{it-1} + \beta_5(\text{TOBINQ})_{it-1} \\ &+ \beta_6(\text{ROA})_{it-1} + \beta_7(\text{R\&D})_{it-1} \\ &+ \beta_8(TECHINT)_{it-1} + \beta_9(IMPORTS)_{it-1} + \beta_{10}(FDI)_{it-1} + \beta_{11}(CU)_{it-1} + \varepsilon_{it}\end{aligned}$$

Here, capacity utilisation and import penetration will be included only for the manufacturing sector analysis.

Table 3 below shows the correlation between sales growth and other explanatory variables. Even though the correlation of sales growth with some variables is statistically significant, but the maximum value is just 0.13. Thus, sales growth measuring state of demand of the industry is not highly correlated with other determinants of merger activity and therefore, its affect is not expected to be confounded by any other variable.

Table 3: Pair-wise Correlation between sales growth and other explanatory variables

TOBINQ	-0.0208 (0.4337)
R&D	0.0479 (0.128)
FDI	0.1343 (0.000)
TECHINT	-0.0246 (0.3699)
ROA	0.0246 (0.3405)
CONC	0.1029 (0.0001)

Significance level is indicated in the parenthesis.

For the estimation analysis, all the explanatory variables are lagged by one year, for two reasons as argued in the literature. Firstly, mergers are expected to be the function of these variables with a lag. Secondly, to confront the simultaneity problem, as some variables like profitability and sales growth might respond to merger itself. Further, all regressions include industry and time fixed effects.

5 Estimation Results

This section discusses the results of intra as well as inter industry merger activity, derived using econometric techniques. Firstly, we discuss the determinants of merger activity by its occurrence and value, respectively, considering the entire set of industries. Then, on the grounds that different dynamics work in manufacturing and service sector, the estimations are discussed for the two sectors – manufacturing and service sector, separately.

5.1 Full Sample

Occurrence of mergers: Before looking at the factors that determine merger intensity, it is worth considering the factors that cause mere occurrence of a merger. Hence, we first start with discussing the factors that can explain the occurrence of merger in a given industry.

Table 2(a) below, shows the results for determinants of occurrence of mergers using logit model, when all the industries are considered together. The first column depicts the results for all deals, which include intra as well as inter industry mergers; second column shows the estimates for intra industry mergers only and the last column reports the results for inter industry mergers only. Among all the possible determinants of merger activity in India, the results show that these two factors – 'concentration and profitability', emerge as the ones having a significant impact on the probability of occurrence of merger in a given industry. The coefficient of the concentration variable is significantly negative for both, intra as well as inter industry mergers. This implies that mergers are more likely to occur in less concentrated

industries. This finding is consistent with the earlier studies (Andrade and Stafford (2004), Powell and Yawson (2005), Agrawal and Sensarma (2007), Fusillo (2009)) which show that lesser concentrated industries are experiencing higher mergers and posit that firms from such industries merge to consolidate and stay competitive in the industry. The coefficient of ROA is positively significant in the estimation modelling inter industry mergers, which implies that inter industry mergers are more likely to occur in profitable industries.

Thus, intra industry mergers are occurring in less concentrated industries only and inter industry mergers are more likely to occur in less concentrated and profitable industries, indicative of expansionary motives behind inter industry mergers. Last three columns report the results for base model dropping the insignificant variables. The results for intra as well as inter industry merger activity remain exactly similar.

Table 2 (a): Logit panel regression modelling occurrence of mergers on industry level variables, considering full sample

	(1) All	(2) Intra-industry	(3) Inter-industry	(4) All	(5) Intra-industry	(6) Inter-industry
SG	-0.153	0.041	-0.278	-0.065	-0.006	-0.070
	(0.168)	(0.370)	(0.181)	(0.063)	(0.083)	(0.051)
TOBINQ	0.226	0.255	0.313			
	(0.349)	(0.366)	(0.301)			
SG^2	0.005	0.012	0.009	0.001	-0.001	0.001
	(0.007)	(0.092)	(0.006)	(0.001)	(0.003)	(0.001)
CONC	0	-1.149**	-1.258***		-1.942***	-1.881***
	(.)	(0.547)	(0.400)		(0.412)	(0.334)
R&D	-7.984	-1.100	33.670			
	(15.697)	(6.985)	(27.872)			
FDI	-1.979	-0.762	-0.094			
	(2.015)	(1.734)	(1.292)			
TECHINT	7.775	5.548	17.230			
	(12.833)	(19.868)	(13.104)			
ROA	6.455*	6.670	9.564***	2.722		4.330**
	(3.796)	(4.292)	(3.402)	(1.719)		(1.853)
N	516	754	754	1037	1396	1396

This Table provides the estimates for occurrence of mergers, which is defined as a dummy variable that takes, value one for a given industry in a given year if merger occurs in that particular industry in that particular year and otherwise zero, regressed on industry level variables. In column 1, the dependent variable is occurrence of merger in a given industry in a given year; in column 2 – the dependent variable is occurrence of intra-industry merger in a given industry in a given year; in column 3 – the dependent variable is occurrence of inter-industry merger in a given industry in a given year. Last three columns report the results for occurrence of - mergers, intra-industry mergers and inter-industry mergers respectively, when regressed on significant variables only. All the explanatory variables are lagged by one year. Logit is used to analyse the occurrence of mergers. All estimation includes industry and time fixed effects, although not reported here. Hausman test is conducted to decide between random effects and fixed effects for each estimation. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 117 industries for 15 years, from 1998 – 2012.

Merger intensity: Next, we discuss the factors that determine merger intensity in a given industry. As has been observed in the clustering analysis above, there is huge variation in the merger intensity across industries. The merger activity is highly concentrated in few industries, with top-10 merger intensive industries accounting for more than half of the total merger activity. Thus, this analysis will provide insights into the factors that are leading to industrial clustering in India.

Table 2 (b) shows the estimates for merger intensity measured by value, using tobit model, considering all the industries. While Column 1 shows the results for all the deals considered together, column 2 and 3 report the results for intra and inter-industry deals, respectively. Albeit the occurrence of a merger is found to be motivated by profits and concentration level of an industry, the results suggest that the merger intensity is significantly higher in the industries that have higher FDI as the coefficient of FDI is positive and significant. Moreover, we observe that this result is driven by intra-industry merger activity. It implies that intra industry mergers of substantial value are taking place in an industry that faces relatively higher competition from foreign players. This result is consistent with Powell and Yawson (2005), who suggested that firms in such industries are more likely to merge within the industry, to brace themselves up against foreign competition that can affect their sales and profitability. Thus, intra industry merger activity is significantly motivated by the competition from foreign players.

Additionally, we do not observe any significant relation between the demand shocks and merger activity. That is, no evidence is observed in favour of an argument that mergers play a role of restructuring activity during the periods of demand shocks. This is consistent with Agrawal and Sensarma (2007), the study on India, which also does not find any significant relation between the industry shocks and merger activity; but is inconsistent with the findings of studies on developed economies. Agrawal and Sensarma (2007) argue that this could be the case owing to the fact that product market competition and corporate strategies are relatively naive in recently deregulated economies like India, as compared to those in developed economies. Thus, firms are reluctant and are risk averse in playing their strategies and prefer to wait for the shocks to subside before merging, as against developed economies.

Further, the relation between the demand shocks and intra industry merger activity also, remains insignificant. Thus, we do not find the evidence of non-monotonic relationship between the state of demand and intra industry merger intensity, as predicted by the Bernile et al (2012) model. It suggests that strategic interactions between the incumbents and entrant are not playing substantial role in determining the merger activity in Indian context. The last three columns, reporting the same estimations with only the significant variables, renders robustness to the significance of FDI in motivating intra industry mergers and insignificance of shocks in determining the same.

Table 2(b): Tobit regression modelling value of mergers on industry level variables, considering full sample

	(1) All	(2) Intra-industry	(3) Inter-industry	(4) All	(5) Intra-industry
SG	-0.002	-0.014	0.004	-0.108	-0.004
	(0.011)	(0.010)	(0.012)	(0.072)	(0.003)
TOBINQ	0.007	-0.001	0.002		
	(0.015)	(0.007)	(0.017)		
SG^2	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.003)	(0.000)	(0.001)	(0.000)
CONC	-0.026	-0.004	-0.029		
	(0.019)	(0.009)	(0.022)		
R&D	-0.206	-0.111	0.071		
	(0.368)	(0.157)	(0.482)		
FDI	0.125*	0.121***	0.045	-0.151	0.0617**
	(0.065)	(0.030)	(0.077)	(0.841)	(0.030)
TECHINT	0.450	0.123	0.456		
	(0.770)	(0.441)	(0.867)		
ROA	0.059	0.009	0.139		
	(0.192)	(0.095)	(0.224)		
N	754	754	754	1030	1030

This Table provides the estimates for intensity of mergers, which in period‘t’ is defined as the sum of the total assets of all targets in a given industry in the financial year just preceding the merger (t-1), scaled by the total assets of all the firms in that industry in that year (t-1). In column 1, the dependent variable is normalised value of all mergers; in column 2 – the dependent variable is normalised value of intra-industry mergers; in column 3 – the dependent variable is normalised value of inter-industry mergers. Last three columns report the results for

intensity of - mergers, intra-industry mergers and inter-industry mergers respectively, when regressed on significant variables only. All the explanatory variables are lagged by one year. Tobit is used to analyse the value of merger activity. All estimation includes industry and time fixed effects, although not reported here.Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 117 industries for 15 years, from 1998 – 2012.

In the next two sections, we assess the determinants of the two sectors – manufacturing and service sector, separately. Out of 4852 deals in total during 1996 – 2012, 46.6% (2263) of the deals have occurred in manufacturing sector and the rest 49.3% (2394) deals have taken place in service sector. During 1996 – 2004, manufacturing sector accounted for 50.3% of total merger deals and dominated the service sector where 45.3% of total merger deals were observed. However, during 2005 – 2009 the sector-wise distribution of merger deals changed in favour of service sector. During this second sub period, 51% of total merger deals were identified in the service sector as against 44.5% deals witnessed in manufacturing sector.

The results show that different factors are motivating merger activity in the two sectors. The results for manufacturing sector are discussed first, which is then followed by the estimations and results of the service sector.

5.2 Manufacturing sector

Occurrence of mergers: Table 3 (a) reports the significant factors determining occurrence of mergers within the manufacturing sector, using logit regressions. First column show the results for all deals, while second and third columns record estimates for intra industry and inter industry deals, respectively. The results show that like previous findings for all the industries, even within the manufacturing sector, the mergers are more likely to occur in less concentrated and more profitable industries. Less concentrated industries are more likely to experience intra industry mergers, however, profitable industries have higher chances to experience both intra as well as inter industry mergers. Additionally, the probability of occurrence of intra industry merger in manufacturing sector is also motivated by technology intensity and capacity utilisation rates of an industry. The coefficients of TECHINT and R&D, both of which are used as proxies to measure technological intensity of an industry, are positive and significant. This implies that technologically intensive industries have a higher probability to experience intra industry merger, as firms in those industries try to exploit technology gains by merging. The coefficient of CU is significantly negative, which indicates that industries with excess capacity are more likely to witness occurrence of intra industry merger. Firms in such industries merge within to reduce or exploit their excess capacity. Andrade and Stafford (2004) found the similar results in their study on U.S. The last three columns report the results for the base model with only significant variables. Except for capacity utilisation (column 5), all the variables for intra-industry and inter-industry merger activity remain significant.

With intra industry mergers being more likely to occur in less concentrated and profitable industries, indicate expansionary motives behind them, which is consistent with the findings

of the existing studies on India (Agarwal and Bhattacharjea (2006), Agrawal and Sensarma (2007)). Also, inter industry mergers too, being driven by profitability of industries, indicate expansionary motives.

Table 3(a): Logit panel regression modelling occurrence of mergers on industry level variables, in the manufacturing sector

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Intra-industry	Inter-industry	All	Intra-industry	Inter-industry
SG	0.345	0.690	0.391	0.701*	1.150*	0.329
	(0.572)	(0.774)	(0.648)	(0.420)	(0.639)	(0.391)
TOBINQ	0.335	0.168	-0.098			
	(0.365)	(0.410)	(0.404)			
SG^2	-0.126	-0.678	0.137	-0.247*	-1.198	-0.080
	(0.254)	(0.774)	(0.330)	(0.149)	(0.744)	(0.131)
CONC	-2.119***	-2.941***	0	-2.511***	-2.860***	
	(0.453)	(0.588)	(.)	(0.379)	(0.489)	
R&D	56.470*	1.284	27.650	39.260*		
	(32.355)	(38.726)	(48.564)	(23.704)		
FDI	-0.921	0.706	-3.016			
	(1.418)	(1.789)	(2.594)			
TECHINT	133.900**	83.350*	-35.590	69.350**	76.420**	
	(53.957)	(49.812)	(54.469)	(31.153)	(35.174)	
ROA	16.530***	14.180***	13.440**	14.970***	10.280**	7.248**
	(4.831)	(5.466)	(5.411)	(3.734)	(4.366)	(3.214)
CU	-1.175**	-1.463***	-0.429	-0.918**	-0.684	
	(0.506)	(0.567)	(0.760)	(0.387)	(0.470)	
IMPORTS	0.016	-0.268	0.103			
	(0.213)	(0.192)	(0.241)			
N	451	451	354	566	616	516

This Table provides the parametric estimates for occurrence of mergers, which is defined as a dummy variable that takes, value one for a given industry in a given year if merger occurs in that particular industry in that particular year and otherwise zero, in the manufacturing sector. In column 1, the dependent variable is occurrence of merger in a given industry in a given year; in column 2 – the dependent variable is occurrence of intra-industry merger in a given industry in a given year; in column 3 – the dependent variable is occurrence of

inter-industry merger in a given industry in a given year. . Last three columns report the results for occurrence of - mergers, intra-industry mergers and inter-industry mergers respectively, when regressed on significant variables only. All the explanatory variables are lagged by one year. Logit is used to analyse the occurrence of mergers. All estimation includes industry and time fixed effects, although not reported here. Hausman test is conducted to decide between random effects and fixed effects for every estimation. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 55 industries for 15 years, from 1998 – 2012.

Merger intensity: The clustering analysis, as discussed in the third section, shows mergers are also concentrated in the manufacturing sector. Therefore, it is important to study the characteristics of the industries in the sector to get better understanding behind the mergers' motives and thus, it's clustering.

Table 3(b) presents the significant factors that are determining the intensity of merger activity in the manufacturing sector, using tobit model. As before, the first, second and third columns show the results for all deals, intra industry deals and inter industry deals, respectively. For the intra industry mergers, we observe that besides affecting the probability of occurrence, the factors concentration and capacity utilisation rate also explain the intensity of the merger activity. Industries with less concentration and excess capacity are more likely to observe higher intensity of intra industry merger activity. This suggests that firms are undertaking considerable value of intra industry merger activity to expand and increase their power in less concentrated industries and to eliminate their excess capacity. Besides these two factors, the results show that foreign presence, too, significantly motivates intra industry merger activity. This indicates that firms are merging within the industry, also to reallocate assets to improve their position against foreign players.

Looking at the factors for inter industry mergers, we find that less concentration and excess capacity are stimulating inter industry mergers as well. This signifies that firms are going even outside the industry to grow the business and be more competent in less concentrated industries and to reduce excess capacity. In an addition to this, we find that the coefficient of sales growth and ROA appears significantly positive. It points out that firms are acquiring targets from another industries to expand or diversify their segments. It indicates expansionary motives behind inter industry mergers.

Similar to the full sample results, we do not find the significance of shocks in explaining merger activity in the manufacturing sector either. Neither the results support the Bernile et al (2012) theory, that is, no significant U-shaped relation is observed between the demand shocks and intra industry mergers. Thus, strategic interactions between incumbents and entrants do not explicate merger activity even in the manufacturing sector.

Further, the results are robust to the exclusion of insignificant factor, as reported in the last three columns. As reported in column 5 and 6, excepting the coefficient of capacity utilisation rate which becomes insignificant for both intra as well as inter industry mergers, all the variables reserve their signs and significance. The coefficients of salesgrowthsquare remains insignificant for intra industry mergers implying insignificance of shocks.

Table 3(b): Tobit regression modelling value of mergers on industry level variables, in the manufacturing sector

	(1) All	(2) Intra-industry	(3) Inter-industry	(4) All	(5) Intra-industry	(6) Inter-Industry
SG	0.0474	-0.00954	0.0832**	0.0548**	-0.0110	0.0553**
	(0.030)	(0.021)	(0.034)	(0.022)	(0.019)	(0.028)
TOBINQ	0.00317	-0.00407	-0.00623			
	(0.018)	(0.011)	(0.020)			
SG^2	-0.000749	-0.0143	-0.00296	-0.0174**	-0.0155	-0.0138
	(0.011)	(0.016)	(0.012)	(0.008)	(0.018)	(0.009)
CONC	-0.0335	-0.0201*	-0.0485*		-0.0228*	-0.0536**
	(0.021)	(0.013)	(0.025)		(0.012)	(0.021)
R&D	-0.630	-1.897	1.423			
	(1.608)	(1.105)	(1.801)			
FDI	0.0797	0.160***	-0.0186		0.0914***	
	(0.068)	(0.042)	(0.079)		(0.034)	
TECHINT	-0.697	-0.0990	-1.689			
	(2.073)	(1.321)	(2.445)			
ROA	0.314	0.163	0.464*			0.354*
	(0.236)	(0.149)	(0.269)			(0.201)
CU	-0.0564**	-0.0250*	-0.0593**	0.0000717	-0.0122	-0.00777
	(0.023)	(0.014)	(0.026)	(0.017)	(0.013)	(0.020)
IMPORTS	0.00187	-0.00228	-0.00205			
	(0.010)	(0.006)	(0.010)			
N	451	451	451	660	516	660

This Table provides the parametric estimates for intensity of mergers, which in period 't' is defined as the sum of the total assets of all targets in a given industry in the financial year just preceding the merger (t-1), scaled by the total assets of all the firms in that industry in that year (t-1) , in the manufacturing sector. In column 1, the dependent variable is normalised value of all mergers; in column 2 – the dependent variable is normalised value of intra-industry mergers; in column 3 – the dependent variable is normalised value of inter-industry mergers. Last three columns report the results for intensity of - mergers, intra-industry mergers and inter-industry mergers respectively, when regressed on significant variables only. All the explanatory variables are lagged by one year. Tobit is used for this analysis. All estimation includes industry and time fixed effects, although not reported

here. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 55 industries for 15 years, from 1998 – 2012.

5.3 Services Sector

Occurrence of mergers: Following the discussion on manufacturing sector, we now discuss the merger activity in the service sector. Table 4(a) presents the results for occurrence of mergers in services, using logit model. As all along, first, second and third columns represent the results for overall, intra and inter industry merger activity, respectively. We observe that for intra industry mergers in the service sector, similar to that in the manufacturing sector, the probability of occurrence of merger is higher in less concentrated industries. However, in services, it is the only variable that turns up significant in determining occurrence of mergers. It implies that in the service sector, firms are merging within the industries to expand and to improve their position in less concentrated industries.

For inter industry mergers, as against the finding for the manufacturing sector where profitability appears significant, we find that in the service sector, less concentration and technology intensity invoke inter industry mergers. Arikawa and Miyajima (2007); and Fusillo (2009) argue that technological changes that yield economies of scope may encourage inter-industry mergers. Thus, firms in service sector are targeting targets from another industry to expand and be more competent and to exploit technological complementarities.

These results are confirmed by analysing the same specification with the significant variables only, estimates of which are reported in last three columns. The estimates show that the coefficient of technology intensity in the estimation of inter-industry mergers becomes insignificant but less concentration remains significant in causing the occurrence of both intra as well as inter industry mergers.

Table 4(a): Logit panel regression modelling occurrence of mergers on industry level variables, in the service sector

	(1) All	(2) Intra-Industry	(3) Inter-industry	(4) All	(5) Intra-industry	(6) Inter-industry
SG	-0.299	-0.243	-0.488	-0.051	0.056	-0.027
	(0.239)	(0.635)	(0.315)	(0.060)	(0.101)	(0.081)
TOBINQ	0.143	0.038	-0.613			
	(0.879)	(0.758)	(0.886)			
SG^2	0.009	0.106	0.0143	0.001	-0.003	0.001
	(0.008)	(0.139)	(0.009)	(0.001)	(0.004)	(0.001)
CONC	-2.370***	-2.125**	-3.529***	-2.790***	-2.190***	-2.340***

	(0.706)	(0.840)	(0.815)	(0.325)	(0.410)	(0.371)
R&D	-69.210	-5.132	-9.641			
	(113.180)	(10.797)	(17.065)			
FDI	10.160	0.362	-8.416			
	(6.573)	(7.349)	(7.305)			
TECHINT	26.780	-17.950	58.170**			6.603
	(22.223)	(28.455)	(23.313)			(7.717)
ROA	1.016	0.926	-3.758			
	(12.177)	(12.203)	(13.307)			
N	197	197	197	592	592	495

This Table provides the parametric estimates for occurrence of mergers, which is defined as a dummy variable that takes, value one for a given industry in a given year if merger occurs in that particular industry in that particular year and otherwise zero, in the service sector. In column 1, the dependent variable is occurrence of merger in a given industry in a given year; in column 2 – the dependent variable is occurrence of intra-industry merger in a given industry in a given year; in column 3 – the dependent variable is occurrence of inter-industry merger in a given industry in a given year. . Last three columns report the results for occurrence of - mergers, intra-industry mergers and inter-industry mergers respectively, when regressed on significant variables only. All the explanatory variables are lagged by one year. Logit is used to analyse the occurrence of mergers. All estimation includes industry and time fixed effects, although not reported here. Hausman test is conducted to decide between random effects and fixed effects for every estimation. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 55 industries for 15 years, from 1998 – 2012.

Merger intensity: It is worthwhile to explore the factors that are leading to huge variation in the merger intensity across industries in the service sector, as observed in the clustering analysis. This section will, therefore, discuss the mergers' motives and hence, the reasons for merger clustering, in the sector. The table 4(b) below shows that merger activity in the service sector is clustered in less concentrated industries (reported in column 1). The coefficient of CONC appears significant and negative for both, intra as well as inter industry merger activity (reported in columns 2 and 3). Thus, intra as well as inter industry merger activity is significantly motivated by the concentration level of the industry, with higher prevalence observed in less concentrated industries. It is possibly owing to the efforts of firms to be more efficient and proficient in fragmented industries.

In the last three columns, where the results are documented for the same specification dropping the insignificant variables, the significant relation between the concentration level and merger intensity is affirmed. Thus, in the service sector, firms are merging within as well as outside the industries to expand their operations, to be competent in less concentrated industries. Further, as has been observed throughout until now, the coefficients of sales growth and salesgrowthsquare remains insignificant for service sector too, implying no significant relation between mergers and industry shocks. The relation remains insignificant

even for intra industry mergers, which stands contrary to the prediction of the Bernile et al (2012) model.

Table 4(b): Tobit regression modelling value of mergers on industry level variables, in the service sector

	(1) All	(2) Intra-industry	(3) Inter-industry	(4) All	(5) Intra-industry	(6) Inter-industry
SG	-0.00520	-0.00401	-0.00454	-0.0596	-0.000704	-0.0443
	(0.017)	(0.007)	(0.019)	(0.089)	(0.003)	(0.103)
TOBINQ	0.0122	-0.00113	0.00828			
	(0.031)	(0.006)	(0.036)			
SG^2	0.000451	0.000405	0.000451	0.000466	-0.0000127	0.000300
	(0.001)	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)
CONC	-0.108***	-0.0203**	-0.114**	-1.402***	-0.0557***	-1.647***
	(0.039)	(0.008)	(0.045)	(0.448)	(0.014)	(0.530)
R&D	-0.390	-0.0868	-0.131			
	(0.465)	(0.088)	(0.602)			
FDI	-0.288	0.0468	-0.607			
	(0.329)	(0.072)	(0.376)			
TECHINT	0.653	-0.0656	1.001			
	(1.155)	(0.290)	(1.286)			
ROA	-0.695	-0.0795	-0.938			
	(0.530)	(0.110)	(0.602)			
N	197	197	197	592	592	592

This Table provides the parametric estimates for intensity of mergers, which in period 't' is defined as the sum of the total assets of all targets in a given industry in the financial year just preceding the merger (t-1), scaled by the total assets of all the firms in that industry in that year (t-1) , in the service sector. In column 1, the dependent variable is normalised value of all mergers; in column 2 – the dependent variable is normalised value of intra-industry mergers; in column 3 – the dependent variable is normalised value of inter-industry mergers. Last three columns report the results for intensity of - mergers, intra-industry mergers and inter-industry mergers respectively, when regressed on significant variables only. All the explanatory variables are lagged by one year. Tobit is used for this analysis. All estimation includes industry and time fixed effects, although not reported here. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 55 industries for 15 years, from 1998 – 2012.

However, to completely reject the proposition of Bernile et al (2012) model which says that strategic interactions between incumbents and entrant determine intra industry merger

activity, we perform another two estimations and hence, discuss their results in the following sections. Their model suggests that such interactions are important in industries with high concentration and with higher competitive interactions. Therefore, the subsequent estimations test the significance of shocks for intra industry merger activity over the two different subsamples: one, over the industries that exhibit high concentration level and the second, over the industries that evince higher degree of competitive interactions.

5.4 Results for intra industry merger intensity, by Concentration: Along the lines of Bernile et al (2012) study, we construct the sample of industries with high concentration. This is done in two steps – first, for each industry, the median value of HHI is calculated for the entire time period. In the second step - the industries are partitioned into high and low concentrated industries by looking at whether their median value of HHI is above or below the median value of all the medians calculated in step 1.

Table 5 below shows estimates for the intra industry merger intensity using tobit regressions, for the subsample of industries with high concentration. First column reports the results for all the industries with high concentration, while second and third columns display the results for highly concentrated manufacturing industries and highly concentrated service industries, respectively. The results remain intact, that is, the coefficient of sales growth and salesgrowthsquare remain insignificant even for the industries having high concentration. For the manufacturing sector as well as service sector[5], the results do not depict the predicted U-shaped relation between the sales growth and intra-industry mergers. Thus, even in highly concentrated industries, as against the prediction of the theory, the strategic interactions among incumbent players to deter entry of new firms does not seem important in determining intra industry merger activity in India.

Table 5: Regression estimates of horizontal merger activity in the subsample of high concentration

	(1) Full Sample	(2) Manufacturing	(3) Services
SG	0.055	0.059	0.003
	(0.048)	(0.104)	(0.046)
TOBINQ	0.023	0.024	-0.149
	(0.045)	(0.076)	(0.108)
SG^2	-0.028	-0.041	-0.017
	(0.022)	(0.045)	(0.018)

[5] R&D is not included in the estimations of service sector, as this variable has a lot of missing observations and its inclusion in this (service sector-high concentrated) subsample is reducing the total number of observations significantly.

R&D	-0.100	-8.499	
	(0.341)	(5.543)	
FDI	0.361***	0.441**	-2.207***
	(0.124)	(0.188)	(0.709)
TECHINT	0.807	0.186	2.317
	(1.631)	(5.011)	(1.641)
ROA	-0.439	-0.054	3.023***
	(0.399)	(0.761)	(1.165)
CU		-0.040	
		(0.108)	
IMPORTS		-0.056	
		(0.153)	
N	265	170	110

This Table provides the parametric estimates for the relation between sales growth and intra-industry merger activity for highly concentrated sub sample. In column 1, the results are reported for the subsample created while considering all the industries, column 2 and column 3 presents the results for the subsamples created within the manufacturing sector and service sector, respectively. All the explanatory variables are lagged by one year. Tobit methodology is used for the estimations. All estimations include industry and time fixed effects, although not reported here. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 59 industries in the first sample and 28 and 25 industries within the manufacturing sector and service sector subsamples, for 15 years, from 1998 – 2012.

5.5 <u>Results for intra industry merger intensity: by Strategic Interactions</u>: In this section, we discuss the results that show the statistical significance of strategic interactions among the incumbents and entrant, in causing intra industry merger activity across the industries with high competitive interactions. Yet again, measuring the strategic interactions in the same way as determined by Bernile et al (2012), a sub sample of industries with high strategic interactions is created as follows.

The degree of competitive interactions is measured using the proxy – competitive strategic measure (CSM), defined as the correlation between the change in firm's profits to the change in its own sales and the change in the combined sales of the rival firms.

CSM = corr (change in firm's profits/change in its own sales, change in combined sales of rival firms)

where, the rival firms are defined as all the other firms present in the same industry and all the changes are taken as quarterly changes.

In the first step, the mentioned correlation is calculated for each firm, for 20 quarters rolling windows. Then, the average correlation is calculated for each industry year. The negative sign of CSM indicates the firms' actions are strategic substitutes and positive sign suggests that the firms' actions are strategic complements. The magnitude of CSM indicates the degree of strategic interactions, with high absolute value of CSM indicating higher competitive interactions among firms in an industry and vice-versa. The authors assume the competition in quantities in their model, and hence, similar to their study, we restrict the sample to the negative industry years. Based on the absolute value of CSM, we partitioned the restricted sample into two subsamples – high CSM and low CSM. This again is done in two steps – first, for each industry, the median value of CSM is calculated across the years. In the second step – the industry-years are partitioned into high and low CSM by looking at whether the absolute CSM in a given industry-year is above or below the median value of that industry, calculated in step 1.

Table 6 report the results for intra industry merger intensity using tobit regressions, considering the industry-years with high CSM only. Once again, first column registers the estimates for all the industries with high CSM, while second and third columns document the results for the sub sample of high CSM industries within manufacturing and services[6], respectively. The table further strengthens our argument that the strategic interactions between the incumbents and the potential entrant do not explain intra-industry merger activity in India. No significant relation is observed between sales growth and intra industry merger activity, when all the industries with high CSM are considered. Even within the manufacturing and services, the results remain unchanged.

Table 6: Regression estimates of Horizontal merger activity in the subsample of high CSM

	(1)	(2)	(3)
	Full Sample	Manufacturing	Services
SG	0.010	-0.013	0.006
	(0.010)	(0.020)	(0.018)
TOBINQ	0.005	-0.002	-0.039*
	(0.006)	(0.009)	(0.022)

[6] R&D is not included in the estimations of the service sector, as this variable has a lot of missing observations and its inclusion in this (service sector-high CSM) subsample is reducing the total number of observations significantly.

SG^2	-0.003 (0.003)	0.007 (0.013)	-0.003 (0.007)
ROA	0.109 (0.087)	0.238 (0.175)	-0.559*** (0.210)
R&D	0.546 (0.892)	0.911 (1.271)	
FDI	-0.0261 (0.030)	-0.060 (0.049)	0.130 (0.130)
TECHINT	0.432 (0.398)	3.015** (1.488)	-0.265 (0.442)
CONC	-0.007 (0.008)	-0.022* (0.013)	0.001 (0.016)
CU		-0.004 (0.015)	
IMPORTS		-0.005 (0.014)	
N	176	106	70

This Table provides the parametric estimates for the relation between sales growth and intra-industry merger activity in the subsample of high CSM industry-years, that is, for those industry-years in which the CSM value is greater than the median CSM value of the corresponding industry calculated across the years, when the entire sample is restricted only to the industry-years with negative CSM values. In column 1, the results are reported for the subsample created while considering all the industries, column 2 and column 3 presents the results for the subsamples created within the manufacturing sector and service sector, respectively. All the explanatory variables are lagged by one year. Tobit methodology is used for the estimations. All estimations include industry and time fixed effects, although not reported here. Standard errors are reported in parentheses. *, ** and *** indicates significance at 10 percent, 5 percent and 1 percent, respectively. Data is panel in nature including 61 industries in the first sample and 23 and 30 industries within the manufacturing sector and service sector subsamples.

Thus, all-inclusive we do not find any evidence in favour of the conjecture that strategic interactions among the incumbent players in the presence of threat of a new entry, influence intra industry merger activity in India. This could, perhaps, be the case because the Indian industrial structure is such that the big players are not vulnerable to the entry threat. They already have established market shares, to not to get their decisions influenced by the potential entrant. On the other hand, the small players are so small that they do not have the market power to restrict the entry of a potential entrant by not merging. Further, the proposition of Bernile et al (2012) model does not hold true if mergers take place to exploit

synergistic gains. Thus, if mergers in India are taking place to exploit synergistic gains and not just the monopoly gains, as the model suggests, then this could also explain why this model is not applicable in Indian scenario.

Conclusion

This study assesses the determinants of mergers and acquisitions at industry level in India over 15-year period, from 1998 – 2012. The motives behind the intra industry mergers could certainly be expected to differ from those of inter industry mergers and hence, we contribute to the existing literature by looking at the motives of intra as well as inter industry mergers, separately. Owing to the different dynamics of manufacturing and service sector, we consider the motives behind intra and inter industry mergers, individually for the two sectors.

We observe that in uniformity with the literature, mergers in India too, are occurring in waves and are concentrated in industries and in time. This finding remains consistent within the two sectors. However, unlike the findings of advanced economies, we do not find the clustering of merger activity to be the result of industry shocks. The results do not show any significant relation of intra or inter industry merger activity with industry shocks, in either of the two sectors. Nonetheless, our result is consistent with the existing study on India (Agrawal and Sensarma (2007)), which finds the shocks to be insignificant and postulate that this could be due to the developing nature of India, wherein , the firms are naïve and thus, are reluctant to undertake such major strategies during the uncertain periods of industry shocks.

The results show that intra as well as inter industry merger activity is clustered in less concentrated industries, in both the sectors. Additionally, in the manufacturing sector, intra industry merger activity is also higher in industries with high FDI and inter industry merger activity is higher in industries with high sales growth and profits.

An important implication of our results is that they provide useful insights into the motives behind merger activity in India. Firstly, firms in both the sectors are adhering to mergers to expand and compete efficiently in fragmented industries. The fact that mergers are considerably taking place in less concentrated industries, but not in high concentrated industries, points out to the fact that currently they are not likely to cause any adverse effect on competition or harm the interests of the consumers, but sizeable intra industry merger activity in less concentrated industries can create a potential threat to the fair competition in the economy. Secondly, intra industry merger activity in the manufacturing sector, is also motivated by the aim to consolidate to strengthen and improve the position against foreign players, as industries characterised by higher foreign presence are experiencing higher M&A. Thirdly, inter industry mergers in the manufacturing sector, are arising from expansionary motives, as firms characterised by higher level of profits and sales growth are facing higher merger activity.

These motives corroborate the findings of literature that merger activity is an effective tool that allow corporate restructuring to remove inefficiencies; and faster and efficient way to

expand the operations; but is facilitating industry consolidation. This provides an important implication for the competition authorities that even if mergers are clustered in less concentrated industries, the authorities need to remain vigilant in assessing the competitive effects of mergers to prevent activities that can have adverse effect on competition in India.

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