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P L BEENA
L T ABHINAV SURYA



Centre for
Development Studies
Thiruvananthapuram - 695011
Kerala, India

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**Working Paper**

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# MERGERS & ACQUISITIONS AND INNOVATION: EVIDENCE FROM A PANEL OF HIGH-TECH AND MEDIUM-TECH FIRMS IN INDIA

P. L. BEENA*

L.T. ABHINAV SURYA**

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(Under the aegis of Govt. of Kerala & Indian Council of Social Science Research)
Thiruvananthapuram, Kerala, India

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*Professor, Centre for Development Studies, Thiruvananthapuram.
Email: beenaplcds@gmail.com

**PhD Scholar, Centre for Development Studies, Thiruvananthapuram.

# Abstract

This study examines the effect of mergers and acquisitions (M&As) on innovation in India's high- and medium-high-technology (HT&MT) manufacturing industries under the post-TRIPS intellectual property regime. Using a panel of 238 listed acquiring firms from 2004 to 2020 and estimating random-effects Tobit, RE-GLS, and IV-2SLS models, we find that M&A activity has a robust positive effect on in-house R&D intensity but no statistically significant effect on technology-licensing intensity. This suggests that M&As primarily strengthen internal R&D capabilities rather than facilitate external technology acquisition. The direction of M&A activity matters: inward cross-border acquisitions are associated with lower R&D intensity and higher royalty payments, indicating that foreign parents transfer technology through licensing rather than expand local research, thereby potentially weakening domestic technological creation. Outbound M&As show no significant effect, suggesting that Indian firms acquire firms abroad for various motives including market expansion. Higher expenditure on technology-licensing fees is not associated with greater R&D intensity, suggesting that in-house R&D and external technology acquisition are not necessarily complementary. Firm age is positively associated with in-house R&D, while larger firm size is associated with greater technology-licensing expenditure, indicating that experience spurs R&D investment, whereas large firms tend to acquire technology externally rather than develop it internally. The study recommends that the Competition Commission of India avoid a one-size-fits-all innovation-impact standard and formally incorporate the direction of M&A deals—inbound, domestic, or outbound—into merger review, alongside the 2023 deal-value threshold. Stricter conditionalities on acquisitions involving large firms are needed to promote domestic innovation and long-term technological capabilities.



**Keywords** : Mergers and Acquisitions, Research and Development, Technology, Competition, Technological sovereignty

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# 1 Introduction

Antitrust concerns surrounding innovation and competition have attracted growing scholarly attention, particularly with the emergence of the new digital economy dominated by the United States and China. Together, these two countries account for 50 per cent of the world's hyperscale data centres, 70 per cent of the world's top AI researchers, the highest rates of 5G adoption, 94 per cent of all AI start-up funding over the past five years, and almost 90 per cent of global market capitalisation (UNCTAD, 2021). Indian firms are increasingly engaging in consolidation and foreign acquisitions to enhance efficiency, market power, access to global value chains, modern technology, markets, brands, patents, designs, copyrights, and trademarks (Beena, 2022). It has further been observed that many successful large and small firms in India, including start-ups, have been acquired by incumbent players, whether Indian or foreign (Beena & Byahut, 2026b; Saraswathy, 2016). While such acquisitions are viewed as growth strategies from the perspective of the firms involved, they can also undermine the innovative and competitive dynamics of the relevant market (Beena & Byahut, 2026a; Cunningham et al., 2021; Francis, 2018; Parsheera et al., 2017; Pires-Alves et al., 2019).

Although numerous empirical studies in the Indian context have examined the effects of mergers and acquisitions (M&As) on competition, market structure, and efficiency (Beena & Sahoo, 2022; Mishra, 2018; Saraswathy, 2017), the impact of M&As on innovation has received limited scholarly attention (Basant & Jaiswal, 2022; Saraswathy, 2018; Vyas & Narayanan, 2016). While studies have investigated the impact of innovation on the performance and productivity of high- and medium-technology industries in India (Chaudhuri, 2018; Dhanora et al., 2020), particularly following the implementation of TRIPS, there has been minimal effort to explore how M&As affect innovation in the country's knowledge- and technology-driven sectors. In light of this gap, the present paper investigates the trends and nature of M&As in the Indian corporate sector, their effects on innovation in knowledge- and technology-driven manufacturing industries, and their potential antitrust ramifications.

The study is structured as follows: Section 2 presents theoretical debates on M&As, Innovation and Competition Policy Implications. Section 3 analyses the pattern and nature of M&As from 2004 to 2022, along with the size distribution of acquiring firms. Section 4 describes the data, methodology, model, and variable specifications. The empirical results and their implications are presented in Section 5. Section 6 outlines the

main conclusions and highlights potential areas for future research.

# 2 M&As and Innovation: Theoretical Debates and Competition Policy Implications

Under IPR, patents are regarded as a mechanism that grants monopoly power to the inventor, enabling the appropriation of returns from invention. Competition for innovation in a given market can thus create temporary monopolists who may crush potential innovators or competitors through innovation—a scenario termed Schumpeterian rivalry (Aghion et al., 2005). The Competition Act of India recognises the need to strike a balance between granting IPR and maintaining free competition (Government of India, 2019). However, much of the consolidation or acquisition of technology- and knowledge-intensive firms in India may escape the regulatory purview of the CCI Act, particularly when the size of the acquired firm in terms of turnover and market share is small but possesses significant innovative potential. Such acquisitions were generally approved based on the assumption that M&As have a positive impact on innovation, efficiency, and consumer welfare (Government of India, 2002, 2019). However, a merger between two firms pursuing different innovation paths can eliminate the innovation of one or both paths (Cunningham et al., 2021; Francis, 2018). It has therefore been suggested that antitrust authorities should strive to protect market diversity by adhering to Shapiro's principles- including stricter scrutiny of mergers involving dominant firms, preserving competition from potential and emerging rivals, and preventing dominant firms from entrenching their market power through exclusionary conduct (Sidak & Teece, 2009). Especially since the mid-1990s, antitrust policy analysis has been dominated by post-Chicago school methodologies rather than the structure-conduct-performance framework proposed by the Harvard school (Budzinski, 2008). With rising regulatory challenges facing technology markets, there has been growing debate in recent years over what should constitute the core focus of antitrust regulation—a focus capable of facilitating healthy competition, improving the welfare of consumers and workers, and spurring economic growth (Khan, 2017, 2019; Shapiro, 2019). The relationship between competition and innovation has long been debated in antitrust theory, particularly within the Schumpeterian tradition and the Arrow–Schumpeter debate (Shapiro, 2012). One perspective holds that reduced competition can promote innovation by enabling firms to exploit economies of scale and scope, manage the risks associated with substantial R&D investments, and draw on a broader knowledge base

(Gilbert & Newbery, 1984; Schumpeter, 1934/1983). In contrast, Arrow (1972) argues that greater competition promotes innovation by improving production efficiency and reducing costs. Aghion and Tirole (1994) suggest that mergers can contribute positively to innovation through a selection mechanism in which firms with weaker research prospects acquire firms with stronger innovation prospects. However, mergers may also adversely affect employees' incentives to participate in innovation projects by increasing the number of research divisions within the merged entity (Rajan et al., 2000). Similarly, horizontal mergers between innovative firms may reduce innovation efforts (Motta & Tarantino, 2021; Stiebale & Reize, 2011). While Kleer (2006) finds that M&As strengthen the innovation incentives of surviving firms, Schulz (2007) argues that these incentives may disappear once organisational considerations are taken into account.

Empirical studies provide mixed evidence on the relationship between M&As and innovation. Examining the high-tech computer industry between 1986 and 1992, Hagedoorn and Duysters (2002) find that M&As affect technological performance. Dessyllas and Hughes (2005) observe that knowledge accumulation, rather than the development of in-house R&D, is the primary motivation for acquisitions in the high-technology sector. However, studies covering different industries and countries report a negative relationship between M&As and R&D performance (Comanor & Scherer, 2013; Haucap et al., 2019; Hitt et al., 1991; Ornaghi, 2009; Ravenscraft & Scherer, 1987) The relationship between competition and innovation is similarly contested. Bloom et al. (2016) show that increased competition resulting from imports raises patenting activity and IT intensity. By contrast, Bandick et al. (2014) find a positive association between foreign acquisitions and R&D intensity. Bertrand et al. (2012) suggest that foreign acquirers have an incentive to increase R&D in their foreign affiliates after an acquisition to prevent domestic rivals from expanding.

Studies using patent-based measures of innovation also report divergent findings. Cloodt et al. (2006) find that the innovation performance of high-technology acquiring firms declines following mergers with targets possessing a substantial knowledge base. Similarly, Stahl (2010), using patent and citation data, finds that firms increase sequential innovation before mergers but reduce it afterwards. In contrast, Sevilir and Tian (2012), measuring innovation through patent counts and patent novelty, find a positive effect of mergers on innovation. These differences suggest that the relationship between M&As and innovation may depend on how innovation is measured and on the characteristics

of the firms involved. Market share may also influence this relationship. Blundell et al. (1999) show that firms with higher market shares are better able to commercialise innovations, thereby strengthening their incentives to innovate.

The effects of M&As on innovation may also vary across industries because of differences in both observable and unobservable characteristics. For instance, the magnitude and duration of innovation rents may differ between the pharmaceutical industry, the information and communication industry, and the oil and mining industries. Cohen et al. (2000) argue that the intensity of competition varies across industries and provide evidence of corresponding differences in innovative activity. Firm-level characteristics and the type of merger may also matter. Kukuk and Stadler (2005) find that firms with a history of innovation are more likely to innovate in the future, with this effect potentially becoming more pronounced over the long run. Horizontal and vertical mergers may eliminate competing firms or combine the production of complementary goods, potentially improving efficiency (Entezarkheir & Moshiri, 2018). However, Ma and Liu (2017) argue that horizontal and conglomerate mergers may reduce innovation due to monopoly effects and failure of integration of technologically similar firms in enhancing the acquirer's existing innovation capability, whereas vertical mergers may be positively associated with it.

Evidence also suggests that the effects of M&As may differ according to the geographical direction of the acquisition and the sector concerned. Bertrand and Zuniga (2006) find that domestic M&As weaken R&D investment, whereas inward cross-border M&As tend to have the opposite effect. In the Indian pharmaceutical industry, Basant and Jaiswal (2022) find that acquisitions increase investment in the development of innovation capabilities, while mergers have no statistically significant effect. A positive association between M&As and R&D intensity in the pharmaceutical industry is also reported by Vyas and Narayanan (2016). Another study by Saraswathy (2017) reveals that cross-border M&As in the Indian manufacturing sector are associated with greater reliance on imported technology as reflected in expenditure on royalties and technical know-how relative to in-house R&D.

Although numerous studies have examined the effects of mergers on innovation in both developed and developing countries, relatively little research has focused on the effects of M&As in India's high-tech and knowledge-intensive industries. Against this background, the following section examines the growth and structural patterns of M&As,

as well as the size distribution of acquiring firms involved in M&As in the high-tech and medium-tech industries, before proceeding to the empirical model and results.

# 3 Trends and Pattern of Mergers and Acquisitions

The growth patterns of mergers and acquisitions (M&As) in India between 2004 and 2023 are examined in terms of both the number and value of deals. For this purpose, we compiled monthly data on M&As in the Indian corporate sector from the Venture Intelligence database. The dataset covers domestic M&As between Indian firms, inbound deals involving the acquisition of Indian firms by foreign firms, and outbound deals involving Indian firms acquiring firms overseas. We classify M&A deals into three broad categories based on the sectors in which the firms operate: resource-based industries (mining, oil and gas, metals, forestry, and utilities), manufacturing-based industries (pharmaceuticals, electronics, machinery, and related industries), and services (finance, logistics, telecommunications, retail, and consulting, among others). This classification is important because the present study focuses on the effects of M&As in India's high-tech and medium-tech manufacturing industries. The industrial distribution of firms involved in M&As is identified using the two-digit National Industrial Classification (NIC) 2008 codes. To classify industries by technological intensity, we adopt the OECD's technology-based classification, which distinguishes low-technology industries from high-technology and medium-high-technology industries (Deng, 2009).

The total number of M&A transactions increased from 131 in 2004 to 647 in 2015, before reaching 1,003 in 2022. Although deal values were unavailable for many transactions, the aggregate value of M&A deals in the Indian corporate sector between 2004 and 2022 amounted to US$ 5,513 billion.

Figure 1: Trends in M&As across years

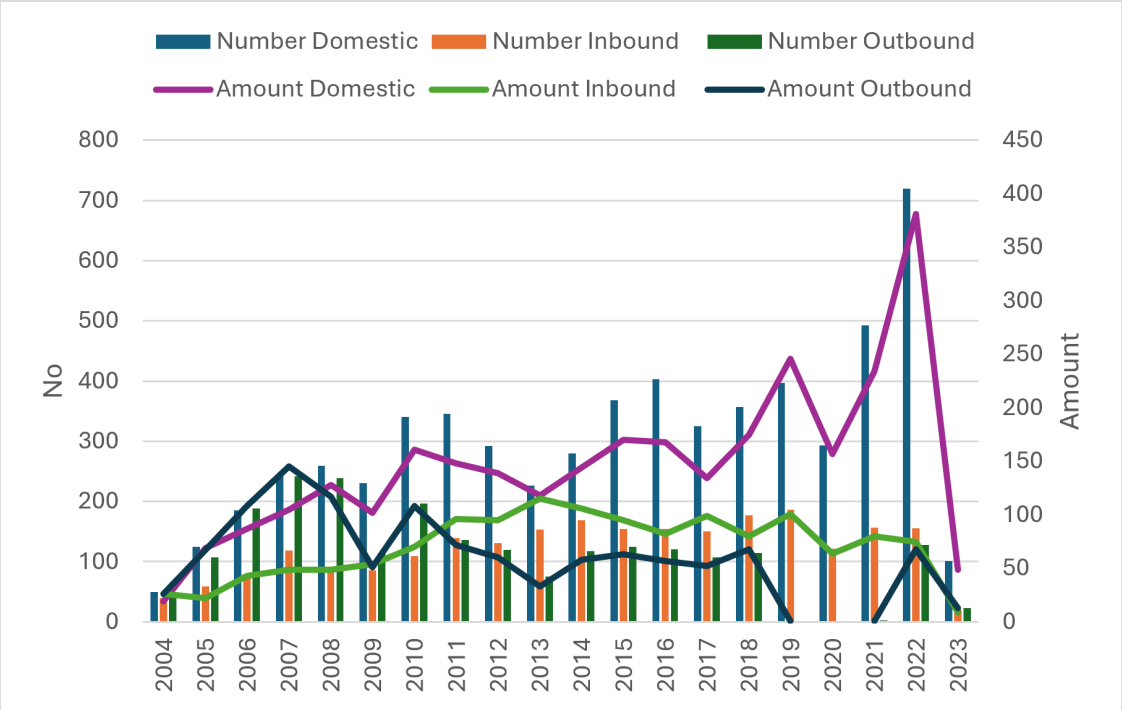



Table 1: Sectoral Distribution of M&A Deals between 2004 and 2022

| Sector | Number | Value in Billion USD |
|---|---|---|
| Resource based | 258 (2.41) | 120 (2.17) |
| Manufacturing | 3383 (31.68) | 1788 (32.43) |
| Services | 7035 (65.89) | 3605 (65.39) |
| Total | 10676 (100) | 5513 (100) |

*Note*: Values in brackets represent the percentage of total deals
*Source*: Authors' estimation based on Venture Intelligence dataset

Between 2004 and 2022, the services sector accounted for the largest share of M&A deal value in the Indian corporate sector, at 66%, followed by the manufacturing sector at 32% and the resource-based sector at 2%. In terms of the type of transaction, horizontal M&As accounted for 54% of deals, while vertical M&As accounted for 45%.

Within the resource-based sector, the extraction of crude petroleum and natural gas accounted for a substantial share, at 32%. In the services sector, computer programming, consultancy, and related activities (NIC-62) accounted for one-third of all M&A deals, while publishing (NIC-58) accounted for 11%. Notably, 65% of target firms in these

sectors were unlisted, and 85% of these unlisted targets—predominantly small firms or start-ups—were acquired by either domestic or foreign firms.

In the manufacturing sector, nine industries accounted for a combined 78% of M&A deals: the manufacture of pharmaceuticals, medicinal chemicals, and botanical products (17%); chemicals and chemical products (12.5%); motor vehicles, trailers, and semi-trailers (11%); food products (9%); machinery and equipment n.e.c. (8%); other non-metallic mineral products (6%); basic metals (6%); electrical equipment (5%); and computer, electronic, and optical products (4%) (further information provided in Appendix Table A.1).

Further analysis reveals that high-tech and medium-high-tech industries accounted for 58% of the total value of M&A deals between 2004 and 2022, compared with 42% for low-tech industries (Table 2). Of the 3,383 M&A deals recorded in the manufacturing sector during this period, 2,004 (59%) involved high-tech and medium-high-tech industries (Table 2).

Table 2: Technological Distribution of M&As in the Manufacturing Sector

| Sector | Number | Value in Billion USD |
|---|---|---|
| Low Tech (LT) | 1379 (40.76) | 757 (42.33) |
| High Tech (HT) | 2004 (59.24) | 1031 (57.66) |
| Total | 3383 (100) | 1788 (100) |

*Note*: Values in brackets represent the percentage of total deals
*Source*: Authors' estimation based on Venture Intelligence dataset

The Indian corporate sector has experienced both inflows and outflows of foreign direct investment (FDI) through cross-border mergers and acquisitions (CBM&As). Our analysis supports this observation. Of the 1,573 M&A deals in the sample between 2004 and 2023, 873 (56%) involved acquisitions between domestically owned Indian firms, while 334 (26%) were inbound deals and 362 (21%) were outbound deals. One-third of inbound deals involved US-based firms. Furthermore, approximately one-fourth of the acquiring firms were unlisted, limiting the scope for analysing their activities using the PROWESS database.

Among the inbound deals, 162 involved firms in high-tech and medium-high-tech (HT&MT)

industries, with a relatively large share concentrated in the pharmaceuticals and automobile industries. Foreign-owned firms also acquired numerous companies operating in iron and steel, IT and IT-enabled services, electronics, energy, platform industries, automation, the fast-growing Indian inverter and secured power markets, and the crane, elevator, and escalator markets.

Of the 362 outbound deals, 183 involved firms in HT&MT industries, of which 40% were in the pharmaceuticals sector and 17% in the chemicals industry. Among these overseas acquisitions, 81 involved firms in the United States. One-third of the deals were undertaken by unlisted firms, making it difficult to track their subsequent outcomes[1]. Furthermore, most acquiring firms listed in the PROWESS database were either domestic or global leaders in their respective industries.

Table 3 presents the distribution of acquiring firms by sales size across the seven industries considered in this study. Although 2,004 M&A deals took place in HT&MT industries, many involved unlisted firms and could not be included in the analysis. Consequently, the study identified 454 acquiring firms for inclusion in the sample. This reflects, in part, the fact that some firms undertook multiple acquisitions and were therefore involved in repeated deals, while others were not listed in the PROWESS database. Sales data for 2020 were available for only 372 of these firms. Accordingly, this subsample was considered to analyse the size distribution of firms involved in M&A activity in India's HT&MT manufacturing industries.

Table 3: Size-wise Distribution of Acquiring Firms across HT&MT Industries

| 2-digit NIC Code | Number of firms across size categories | | | | | | | Total Firms in PROWESS |
|---|---|---|---|---|---|---|---|---|
| | ≤ 250 | 250–500 | 500–1,000 | 1,000–5,000 | 5,000–10,000 | ≥10,000 | Total | |
| 20 | 2 | 0 | 7 | 18 | 23 | 43 | 93 | 114 |
| | (2.15) | (0) | (7.53) | (19.35) | (24.73) | (46.24) | (100) | |
| 21 | 3 | 3 | 2 | 26 | 10 | 34 | 78 | 97 |
| | (3.85) | (3.85) | (2.56) | (33.33) | (12.82) | (43.59) | (100) | |
| 26 | 5 | 4 | 3 | 11 | 1 | 1 | 25 | 34 |
| | (20) | (16) | (12) | (44) | (4) | (4) | (100) | |
| 27 | 2 | 1 | 1 | 6 | 7 | 19 | 36 | 43 |
| | (5.56) | (2.78) | (2.78) | (16.67) | (19.44) | (52.78) | (100) | |
| 28 | 3 | 1 | 9 | 15 | 14 | 18 | 60 | 69 |
| | (5) | (1.67) | (15) | (25) | (23.33) | (30) | (100) | |
| 29 | 2 | 1 | 2 | 17 | 14 | 31 | 67 | 81 |
| | (2.99) | (1.49) | (2.99) | (25.37) | (20.9) | (46.27) | (100) | |
| 30 | 1 | 0 | 0 | 2 | 2 | 8 | 13 | 16 |
| | (7.69) | (0) | (0) | (15.38) | (15.38) | (61.54) | (100) | |
| Total | 18 | 10 | 24 | 95 | 71 | 154 | 372 | 454 |

*Note*: Values in brackets represent percentage of total sales
*Note*: Size categories in million USD
*Source*: Authors' estimation based on Venture Intelligence and PROWESS dataset

Table 3 indicates that the majority of acquiring firms in the HT&MT industries had sales exceeding 1,000 million, suggesting that larger firms relied on M&As as a growth strategy. This concentration of acquisition activity among larger firms underscores the importance of accounting for firm size in the empirical analysis, particularly when examining the relationship between M&As and innovation.

# 4 Data, Empirical Model and Variable Specification

## 4.1 Data

The empirical analysis combines two primary data sources. The first is the Venture Intelligence database, from which we compiled all M&A deals involving Indian firms over the period 2004–2022. This database records deal type (merger, acquisition of shares, acquisition of assets), deal value, target and acquirer industry, and the direction of the deal (domestic, inbound cross-border, outbound cross-border). The second is the Centre for Monitoring Indian Economy (CMIE) PROWESS database, from which we extracted firm-level financial statements for all publicly listed Indian companies. The two datasets were merged at the firm-year level using the acquirer's name and Prowess company code.

The sample is restricted to two-digit NIC industries 20, 21, 26, 27, 28, 29, and 30 — chemicals, pharmaceuticals, computers and electronics, electrical equipment, machinery, motor vehicles, and other transport equipment — which together constitute the OECD's high- and medium-high-technology (HT&MT) manufacturing sectors. Focusing on HT&MT firms is appropriate because, as mentioned earlier, the innovation–M&A nexus is more relevant in technology-intensive sectors, these sectors experienced the largest wave of consolidation following India's adoption of a TRIPS-compatible IPR regime in 2005, and their R&D and technology-licensing intensities provide meaningful measures of innovation inputs.

Because a substantial fraction of M&A deals in India involve unlisted acquirers or targets, only deals where the acquiring firm could be identified in PROWESS were retained. Of the 2,004 HT&MT manufacturing deals reported in Table 2, 238 listed acquiring firms with reported deal values were matched with PROWESS, yielding an unbalanced panel of 3,262 firm-year observations for the period 2004–2020[2].

## 4.2 Empirical Model

Drawing on the theoretical and empirical literature reviewed above, we define and estimate the following econometric model to examine the relationship between mergers and acquisitions (M&As) and innovation in high-tech (HT) and medium-high-tech (MHT) industries,

$$y_{it} = \beta_0 + \beta_1 M\&A_{it} + \sum_{k=2}^{n} \beta_j x_{kit} + \delta_i + \gamma_t + \varepsilon_{it} \tag{1}$$

Here $y_{it}$ is the variable of interest at any given time ($t$), for a firm ($i$). $x_{kit}$ is the set of covariates. $\delta_i$ and $\gamma_t$ refers to firm and time fixed effects, respectively. $\varepsilon_{it}$ refers to the stochastic error term.

Since disembodied technology can be acquired either through in-house R&D activity or through technology licensing and royalty payments, we estimate Equation (1) using both R&D intensity (measured as the ratio of in-house research and development expenditure to gross sales) and technology licensing intensity (measured as the ratio of royalty and technical-know-how payments to gross sales) as dependent variable[3].

The literature identifies several possible dynamics shaping firms' innovation activities. R&D intensity is the primary proxy used in the literature to measure innovation activity (Hall, 2009; Hitt et al., 1991; Ravenscraft & Scherer, 1987). In contrast, technology-licensing intensity may have mixed effects on firms' innovation activities. Greater global integration and trade may encourage firms to acquire technology externally rather than invest in in-house R&D, potentially undermining the development of domestic technological capabilities in the long run (Pillai, 1979). However, technology acquisition may also complement in-house R&D, as access to advanced and foreign technologies can help firms build their technological capabilities rather than relying exclusively on internally generated innovation (Basant, 1993, 1997; Subrahmanian, 1991).

Accordingly, in this study, we include technology-licensing intensity among the covariates when estimating the model with R&D intensity as the dependent variable, and vice versa, to examine potential complementarity between the two channels. To address endogeneity concerns, these variables are included among the covariates with a one-period lag.

Previous studies have primarily focused on R&D, implicitly treating technology purchases as an undifferentiated residual (Dhanora et al., 2020). The present study therefore estimate the model using both R&D and technology purchases as dependent variables to examine the impact of M&As on Innovation.

## 4.3 Explanatory and Control Variables

To examine the impact of M&As on firms' innovation activities, we consider both the number and the value of deals associated with each acquiring firm. Both measures are constructed cumulatively over time for each firm, rather than as annual flows, to capture the persistent effects of M&A activity on innovation. This approach reflects the stock-like nature of these effects, whereby an acquisition made in 2010 may continue to influence a firm's R&D expenditure in subsequent years.

The effect of M&As on innovation may vary depending on the type and structure of the deals; accordingly, the model incorporates covariates to account for these differences. Two dummy variables distinguish inbound and outbound cross-border M&As from purely domestic deals, with data on cross-border transactions compiled from the

Venture Intelligence database. Literature predicts opposite effects for the two channels. Inbound acquisitions may lower in-house R&D if foreign parents relocate research to headquarters, or increase it if the parent transfers technology to the domestic subsidiary. Outbound acquisitions may increase R&D by giving the domestic acquirer access to foreign knowledge stocks (Bertrand et al., 2012; Stiebale, 2013).

Furthermore, since horizontal and vertical M&As may affect innovation differently from conglomerate deals, we include a dummy variable to distinguish the former from the latter. M&As are classified as horizontal, vertical, or conglomerate based on the industrial activities of the acquiring and target firms.

We control for firms' market concentration, dominance, and market power using three variables: size, age, and price–cost margin. Firm size is measured as the natural logarithm of gross sales (Basant, 1997; Katrak, 1997), while the price–cost margin is calculated as profit after tax divided by net sales. Neo-Schumpeterian theory predicts a positive relationship between these variables and M&A activity, as larger firms have greater capacity to finance risky R&D, exploit economies of scale, and sustain accumulated absorptive capacity over time (Kumar & Siddharthan, 1997). In contrast, the Arrowian perspective predicts a negative relationship, arguing that monopoly rents may weaken firms' incentives to innovate to escape competition (Arrow, 1972).

We also control for firms' integration into global production networks using export intensity and capital-goods import intensity, each measured as the respective variable divided by gross sales. While exposure to global markets may compel firms to innovate and increase the marginal returns to R&D, the substitution of domestic innovation by technology embodied in imported capital goods and the risk of being trapped in low-value-added export activities may constrain innovation (Narula, 2014).

## 4.4 Methodology

Since many firms in our sample report zero R&D intensity and payments for technical know-how royalties, both dependent variables are censored at zero. We therefore estimate random-effects Tobit models (Greene, 2003; Henningsen, 2012; Tobin, 1958), which account for the censored nature of the dependent variables. In contrast, OLS does not explicitly account for this censoring and may yield biased estimates when applied to such data.

We also estimate Equation (1) using a random-effects generalised least squares (RE-GLS) regression for benchmarking. Furthermore, M&A activity may be endogenous, as firms may undertake mergers in anticipation of future R&D opportunities. However, addressing this concern within a censored regression framework such as the Tobit model is challenging. We therefore additionally estimate Equation (1) using instrumental variable two-stage least squares (IV-2SLS), employing one-year lags of the M&A variables as instruments.

# 5 Results and Discussion

## 5.1 Model Estimation Results

Tables 4 and 5 report the estimation results for Equation (1), using R&D intensity and technology-licensing intensity as the dependent variables, respectively (All model variables were winsorised at the 1st and 99th percentiles to minimise the influence of extreme values on the estimation results. Summary statistics for the key parameters of all model variables are provided in Appendix Table A.2.

Table 4: Determinants of R&D Intensity

| | Tobit | | RE GLS | | IV 2SLS | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| # M&As (Cumulative) | 0.0017*** | | 0.0017*** | | 0.0017*** | |
| | (0.0002) | | (0.0004) | | (0.0004) | |
| (Log) Value of M&As (Cumulative) | | 0.0015*** | | 0.0014*** | | 0.0014*** |
| | | (0.0003) | | (0.0004) | | (0.0004) |
| CBM&A Inward FDI (dummy) | -0.0210*** | -0.0218*** | -0.0087*** | -0.0094*** | -0.0087*** | -0.0094*** |
| | (0.0045) | (0.0046) | (0.0019) | (0.0019) | (0.0019) | (0.0019) |
| CBM&A Outward FDI (dummy) | -0.0005 | -0.0007 | -0.0005 | -0.0007 | -0.0005 | -0.0007 |
| | (0.0016) | (0.0016) | (0.0013) | (0.0015) | (0.0013) | (0.0015) |
| Horizontal/Vertical M&As (dummy) | 0.0028 | 0.0033 | 0.0019 | 0.0027 | 0.0019 | 0.0026 |
| | (0.0042) | (0.0043) | (0.0026) | (0.0026) | (0.0026) | (0.0026) |
| L.Technology-licensing intensity | 0.0218 | 0.0213 | -0.0359 | -0.0380 | -0.0345 | -0.0359 |
| | (0.0842) | (0.0855) | (0.0514) | (0.0505) | (0.0519) | (0.0511) |
| Size | -0.0003 | 0.0007 | -0.0008 | -0.0001 | -0.0009 | -0.0001 |
| | (0.0006) | (0.0006) | (0.0010) | (0.0009) | (0.0010) | (0.0009) |
| Age | 0.0003** | 0.0003** | 0.0001 | 0.0000 | 0.0001 | 0.0000 |
| | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) |
| Profit Margin | -0.0062*** | -0.0075*** | -0.0049 | -0.0060 | -0.0049 | -0.0060 |
| | (0.0019) | (0.0019) | (0.0035) | (0.0033) | (0.0035) | (0.0033) |
| Export Intensity | 0.0042 | 0.0036 | 0.0046 | 0.0042 | 0.0044 | 0.0039 |
| | (0.0024) | (0.0024) | (0.0042) | (0.0042) | (0.0042) | (0.0042) |
| Capital Goods Import Intensity | 0.0624*** | 0.0574*** | 0.0364 | 0.0328 | 0.0361 | 0.0324 |
| | (0.0149) | (0.0152) | (0.0261) | (0.0265) | (0.0260) | (0.0264) |
| N | 2,979 | 2,979 | 2,979 | 2,979 | 2,979 | 2,979 |
| Uncensored | 969 | 969 | | | | |

*Note*: $***p < 0.001, **p < 0.01, *p < 0.05$

*Note*: Unless otherwise mentioned, values in brackets are standard errors

*Note*: Robust SE clustered by firm

*Note*: Domestic M&A is base; conglomerate M&As is base for the horizontal/vertical dummy

*Source*: Authors' estimation based on Venture Intelligence and PROWESS dataset

Table 5: Determinants of Technology-Licensing Intensity

| | Tobit | | RE GLS | | IV 2SLS | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| # M&As (Cumulative) | 0.0000 | | 0.0000 | | 0.0000 | |
| | (0.0002) | | (0.0001) | | (0.0001) | |
| (Log) Value of M&As (Cumulative) | | 0.0001 | | 0.0001 | | 0.0001 |
| | | (0.0002) | | (0.0001) | | (0.0001) |
| CBM&A Inward FDI (dummy) | 0.0157*** | 0.0157*** | 0.0077*** | 0.0077*** | 0.0080*** | 0.0080*** |
| | (0.0025) | (0.0025) | (0.0019) | (0.0019) | (0.0018) | (0.0018) |
| CBM&A Outward FDI (dummy) | 0.0002 | 0.0002 | -0.0002 | -0.0001 | -0.0002 | -0.0002 |
| | (0.0011) | (0.0011) | (0.0001) | (0.0002) | (0.0002) | (0.0002) |
| Horizontal/Vertical M&As (dummy) | -0.0041 | -0.0041 | -0.0016 | -0.0016 | -0.0016 | -0.0016 |
| | (0.0022) | (0.0022) | (0.0011) | (0.0011) | (0.0011) | (0.0011) |
| L.R&D intensity | 0.0533** | 0.0532** | 0.0159 | 0.0147 | 0.0154 | 0.0140 |
| | (0.0178) | (0.0176) | (0.0118) | (0.0119) | (0.0118) | (0.0118) |
| Size | 0.0014*** | 0.0014*** | 0.0004 | 0.0003 | 0.0004 | 0.0003 |
| | (0.0003) | (0.0003) | (0.0002) | (0.0002) | (0.0002) | (0.0002) |
| Age | 0.0001 | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0001) | (0.0001) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Profit Margin | -0.0003 | -0.0003 | -0.0003 | -0.0001 | -0.0003 | -0.0001 |
| | (0.0017) | (0.0017) | (0.0004) | (0.0004) | (0.0004) | (0.0004) |
| Export Intensity | 0.0026 | 0.0026 | 0.0002 | 0.0002 | 0.0001 | 0.0001 |
| | (0.0017) | (0.0017) | (0.0008) | (0.0008) | (0.0008) | (0.0008) |
| Capital Goods Import Intensity | 0.0292** | 0.0292** | 0.0067* | 0.0068* | 0.0069* | 0.0070* |
| | (0.0092) | (0.0092) | (0.0027) | (0.0027) | (0.0028) | (0.0028) |
| N | 2,979 | 2,979 | 2,979 | 2,979 | 2,979 | 2,979 |
| Uncensored | 969 | 969 | | | | |

*Note*: ***p<0.001, **p<0.01, *p<0.05
*Note*: Unless otherwise mentioned, values in brackets are standard errors
*Note*: Robust SE clustered by firm
*Note*: Domestic M&A is base; conglomerate M&As is base for the horizontal/vertical dummy
*Source*: Authors' estimation based on Venture Intelligence and PROWESS dataset

Table 4 shows that M&A activity has a robust positive association with in-house R&D. The coefficients are positive and statistically significant for both the number and value of M&A deals, with these results holding across the benchmark RE-GLS and IV-2SLS specifications (The first-stage diagnostic results for the IV-2SLS model, reported in Appendix Table A.3, show that the coefficients on the one-year-lagged M&A variables are close to unity, indicating that past cumulative M&A activity strongly predicts current cumulative activity, and that the instruments are strong). In contrast, Table 5 shows no statistically significant effect of M&A activity on technology licensing across the different model specifications.

Table 6 reports the marginal effects of M&A activity on R&D intensity and technology-

licensing intensity estimated using the Tobit model. The marginal effect of the number of M&As on R&D intensity is 0.0008, implying that an additional M&A is associated with an average increase of approximately 0.08 percentage points in expected R&D intensity across the HT&MT sample. Relative to the sample mean R&D intensity of 1.21%, a one-standard-deviation increase in cumulative M&A activity (2.92 deals) corresponds to an increase of approximately 0.23 percentage points, equivalent to around 19% of the mean. The marginal effect of the value of M&As is of a similar magnitude (0.0007), indicating that a doubling of M&A value raises the R&D intensity by 0.07 percentage points, suggesting that R&D intensity responds more strongly to the frequency of M&A activity than to the monetary scale of individual deals. This finding is consistent with a learning-by-acquiring mechanism, whereby each additional deal generates integration experience that may enhance firms' capacity to undertake R&D.

Table 6: Marginal Effects

| | R&D Intensity | | Technology-Licensing Intensity | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| # M&As (Cumulative) | 0.0008*** | | 0.0000 | |
| | (0.0001) | | (0.0000) | |
| (Log) Value of M&As (Cum.) | | 0.0007*** | | 0.0000 |
| | | (0.0001) | | (0.0001) |
| ***Control Variables*** | **Controlled** | **Controlled** | **Controlled** | **Controlled** |
| N | 2,979 | 2,979 | 2,979 | 2,979 |

*Note*: $***p < 0.001, **p < 0.01, *p < 0.05$
*Note*: Unless otherwise mentioned, values in brackets are standard errors
*Note*: Robust SE clustered by firm
*Source*: Authors' estimation based on Venture Intelligence and PROWESS dataset

From Table 4 and 5, we also see that the two cross-border channels have varying significance and opposing effects on R&D intensity and technology licensing intensity. While the coefficient of inbound CBM&As is strongly negative in Table 4, and strongly positive in Table 5, outbound CBM&As is essentially zero across all specifications in both tables. This shows that as compared to purely domestic M&As, foreign acquirers tend to reduce R&D activity and increase spending on technology licensing fees, presumably to the parent company at the headquarters. The magnitude of this variable is also large across tables. The lack of significance of outbound M&As variable shows that such

deals have no impact on firms' domestic innovation activities. We also see that horizontal/vertical deals are not significantly different from conglomerate deals in Table 4 and 5.

Table 5 shows that the coefficient on the one-period lag of R&D intensity is positive and statistically significant, whereas Table 4 shows that the coefficient on the one-period lag of technology-licensing intensity is not significant. This indicates that R&D intensity positively influences technology-licensing intensity, but not vice versa. In terms of control variables, in Table 4, Age is significant and in Table 5, Size is significant. Hence, while more experienced firms tend to invest more on in-house R&D activity, larger firms tend to acquire technology by paying licensing fees. In terms of global integration, Capital Goods Import Intensity variable is positive and significant in Tobit model in Table 4, while Capital Goods Import Intensity alone is positive and significant across models in Table 5. Hence, all forms of global integration tend to increase in-house R&D activity, while embodied technology import in the form of capital goods tend to spur acquiring of disembodied technology in the form of payment of licensing fee.

## 5.2 Robustness Check

M&A activity and embodied technology in the form of import of capital goods may not affect firms' innovation immediately, with its effects emerging only over time. To examine this possibility, we re-estimate Equation (1) using Tobit regression, incorporating one-year lag of the cumulative number of M&As and Capital Goods Import intensity as the independent variables. The results, presented in Table 7, show that the sign and statistical significance of the M&A variable remain consistent with those reported in Tables 4 and 5, indicating that our findings are robust to alternative lag structures. The results further show that capital-goods import intensity positively affects both R&D intensity and technology-licensing intensity under the contemporaneous specification, but not under the one-period lag specification.

Table 7: Effects of Lagged Variables on Innovation

| | Dependent Variable | | | |
|---|---|---|---|---|
| | R&D Intensity | | Technology-licensing intensity | |
| | (1) | (2) | (3) | (4) |
| Cumulative # M&As | 0.0017*** | | 0.0000 | |
| | (0.0002) | | (0.0002) | |
| Capital Goods Import Intensity | 0.0624*** | | 0.0292** | |
| | (0.0149) | | (0.0092) | |
| L1.Cumulative # M&As | | 0.0015*** | | 0.0001 |
| | | (0.0002) | | (0.0002) |
| L1.Capital Goods Import Intensity | | 0.0008 | | 0.0002 |
| | | (0.0006) | | (0.0001) |
| **Control Variables** | **Controlled** | **Controlled** | **Controlled** | **Controlled** |
| N | 2,979 | 2,979 | 2,979 | 2,979 |

*Note*: $***p < 0.001, **p < 0.01, *p < 0.05$
*Note*: Unless otherwise mentioned, values in brackets are standard errors
*Note*: Robust SE clustered by firm
*Source*: Authors' estimation based on Venture Intelligence and PROWESS dataset

## 5.3 Discussion

Our empirical results indicate that mergers and acquisitions (M&As) have a positive and statistically significant effect on firms' innovation activity, as measured by R&D intensity, but do not significantly affect technology acquisition through royalty payments and licensing fees. These findings lend support to the Neo-Schumpeterian perspective that M&As can advance the process of creative destruction by integrating firms with the experience, capabilities, or exposure to global markets needed to advance the technological frontier. However, the absence of a significant effect on technology-licensing expenditure suggests that the innovation-related gains from M&As are not multidimensional: greater in-house R&D intensity does not necessarily translate into reduced reliance on externally acquired technology or lower licensing costs.

Furthermore, our results suggest that firms acquired by foreign firms tend to rely more on royalty payments and technical know-how agreements than on in-house R&D. The negative association between inward cross-border M&As and R&D intensity, alongside the positive association with technology-licensing intensity, suggests that foreign parent

firms may transfer technology through licensing agreements rather than establish or expand local R&D activities. From the perspective of the Indian subsidiary, such acquisitions may therefore facilitate the import of technology rather than its development in-house. This finding challenges the assumption that FDI inflows necessarily generate positive technological spillovers by strengthening domestic innovation capabilities. Additionally, the absence of a significant effect of outbound M&As on innovation activity suggests that Indian firms may pursue acquisitions abroad primarily to have access to the market and other strategic assets. In contrast to previous studies, our estimates do not indicate that horizontal or vertical M&As stimulate innovation more strongly than conglomerate deals (Entezarkheir & Moshiri, 2018). This suggests that the effects of M&As on innovation may depend less on the industrial relatedness of the merging firms than on the availability of complementary assets and capabilities that enable firms to translate acquisitions into innovation gains.

Our results also indicate that in-house R&D and external technology acquisition are not necessarily complementary in the Indian context. While higher past R&D expenditure leads to increased expenditure on technology licensing to upgrade capabilities, past technology-licensing expenditure does not enhance in-house research capabilities by raising R&D intensity. Since in-house R&D and technology licensing are not necessarily complementary, global integration may increase R&D intensity while also raising expenditure on technology-licensing fees, as firms seek to utilise the technology embodied in imported capital goods. Thus, the "technology-spillover defence" must distinguish between technology transfer, facilitated through royalty payments and licensing agreements, and technology creation through in-house R&D. Our results further indicate that firm experience is positively associated with in-house R&D activity, whereas larger firm size is associated with higher expenditure on technology licensing. This divergence suggests that the accumulation of technological capabilities through experience may be more important for achieving technological autonomy than scale alone. This further suggests that the monopoly effects of M&As warrant closer scrutiny, since the resulting larger firm may, over the long run, substitute technology purchase for in-house R&D.

# 6 Conclusion and Policy Implications

Our paper examines the relationship between mergers and acquisitions (M&As) and innovation in India's corporate sector, focusing on high- and medium-high-technology

(HT&MT) industries between 2004 and 2022. Manufacturing-sector data show that 58% of M&A deal value was concentrated in these industries. Given the strategic importance of M&As in advancing and consolidating firms' technological capabilities and competitive advantages, understanding their implications for innovation in these industries is particularly important. Our analysis further shows that large firms have relied heavily on M&As as a corporate strategy in the HT&MT sectors. Notably, several foreign firms have acquired unlisted Indian firms in these industries, potentially exploiting the fact that the turnover or asset value of the acquiring firms may fall below the thresholds prescribed by the Competition Commission of India (Government of India, 2019). These trends underscore the significance of our empirical analysis for debates on technological sovereignty, competition policy, and the regulation of M&As in India.

Our empirical estimates show that M&A activity has a robust positive effect on in-house R&D intensity but has no statistically significant effect on technology-licensing intensity. This suggests that, on average, M&As primarily serve to strengthen firms' internal R&D capabilities rather than to facilitate the acquisition of external technology. Instead, firms may rely on trade channels, particularly imports of capital goods, to access externally developed technology. Second, our analysis demonstrates that the direction of M&A activity matters for innovation outcomes. While Indian firms do not appear to use outbound M&As to strengthen their innovation capabilities at home, acquisitions of Indian firms by foreign firms are associated with lower R&D intensity and higher technology-licensing payments. This pattern suggests that inward cross-border M&As may facilitate the transfer of value to foreign parent companies through royalty and licensing arrangements, while potentially weakening the development of domestic research capabilities. Our results have key policy implications. Our study shows that, while reviewing M&A applications, CCI cannot implement a one-size-fits-all "innovation impact" standard. Inbound deals that lower R&D intensity should be scrutinised for their technology-relocation consequences, while outbound deals must be scrutinised further on their impact towards building domestic R&D capabilities. The 2023 amendment to consider deal value (in addition to firm size) is a step in the right direction, but the analysis in this paper suggests that the direction of the deal — inbound vs domestic vs outbound — should also be a formal criterion. This is particularly important because our study shows that while foreign parents do transfer technology, they negatively impact local technology creation and may coincide with a weakening of local R&D activity.

The absence of clear complementarity between in-house R&D and technology licensing, together with the finding that experience spurs R&D intensity while larger firms prefer paying licensing fees, underscores the need for stricter conditionalities on M&As involving large firms to promote domestic innovation and the development of long-term technological capabilities. Additionally, competition policies that encourage uncritical integration into global production networks risk undermining the long-term interests of the domestic economy. Although global integration may stimulate in-house R&D, it is also associated with higher technology-licensing expenditure, without a corresponding complementary relationship between the two. This raises concerns about whether such integration strengthens domestic technological autonomy or perpetuates reliance on externally acquired technology. Finally, our study contributes to the growing literature emphasising the need for competition policy to evolve in response to a rapidly changing technological landscape, with a strategic focus on protecting and strengthening national technological sovereignty.

# Notes

[1]The acquisition of start-ups including those founded by serial entrepreneurs by domestic and multinational firms has become increasingly common in recent years (Beena, 2021; Beena & Byahut, 2026b; Saraswathy, 2019)

[2]The number of acquiring firms is relatively small in this dataset as the same acquiring firms were involved in multiple deals in the same year or different years

[3]The measures used in this study capture innovation inputs rather than outcomes, as R&D expenditure does not necessarily translate into the expected innovation outcomes. Furthermore, many firms do not report their R&D expenditure

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# Appendix

Table A.1: Distribution of Mergers in the Manufacturing Sector

| NIC Code | Industry | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | Food Products | 8.55 | 8.43 | 9.47 | 9.18 | 8.05 | 9.38 | 8.69 | 8.89 |
| 11 | Beverages | 3.59 | 3.4 | 4.25 | 4.9 | 4.43 | 4.43 | 3.93 | 4.03 |
| 12 | Tobacco Products | 0.11 | 0 | 0.36 | 0.41 | 0.27 | 0 | 0.21 | 0.11 |
| 13 | Textiles | 4.58 | 3.83 | 4 | 4.29 | 5.91 | 5.99 | 4.73 | 4.42 |
| 14 | Wearing Apparel | 3.09 | 2.52 | 2.67 | 2.24 | 2.55 | 2.86 | 2.87 | 2.52 |
| 15 | Leather Products | 0.55 | 0.44 | 1.21 | 1.43 | 0 | 0 | 0.59 | 0.62 |
| 16 | Wood Products | 0.55 | 0.44 | 0.61 | 0.61 | 0.13 | 0 | 0.47 | 0.39 |
| 17 | Paper Products | 0.55 | 0.66 | 0.36 | 0.41 | 0.81 | 0.78 | 0.56 | 0.62 |
| 18 | Printing | 0.17 | 0.33 | 0.12 | 0.2 | 0 | 0 | 0.12 | 0.22 |
| 19 | Coke and Petroleum Products | 0.83 | 0.55 | 0.49 | 0 | 0.67 | 0.52 | 0.71 | 0.39 |
| 20 | Chemical Products | 12.69 | 11.83 | 12.38 | 12.45 | 12.62 | 12.24 | 12.59 | 12.08 |
| 21 | Pharmaceuticals Products | 15.55 | 16.98 | 16.5 | 16.73 | 20.54 | 17.97 | 16.88 | 17.11 |
| 22 | Rubber and Plastic Products | 2.43 | 1.64 | 2.67 | 2.45 | 1.48 | 1.3 | 2.28 | 1.79 |
| 23 | Non-metallic minerals | 6.73 | 8.87 | 4.73 | 5.92 | 4.03 | 4.43 | 5.65 | 7.1 |
| 24 | Basic Metals | 6.67 | 7.45 | 5.7 | 6.94 | 3.76 | 3.91 | 5.79 | 6.54 |
| 25 | Fabricated Metal Products | 1.16 | 1.2 | 0.49 | 0.61 | 3.89 | 4.95 | 1.6 | 1.85 |
| 26 | Computer and Electronic Products | 3.97 | 4.05 | 4.37 | 5.1 | 5.5 | 6.77 | 4.4 | 4.92 |
| 27 | Electrical Equipment | 4.91 | 5.15 | 5.22 | 4.9 | 3.89 | 3.91 | 4.76 | 4.81 |
| 28 | Machinery and Equipemnt | 7.39 | 7.45 | 7.52 | 5.92 | 8.99 | 8.59 | 7.77 | 7.27 |
| 29 | Motor Vehicles | 10.76 | 9.09 | 13.23 | 11.22 | 9.53 | 8.33 | 11.08 | 9.51 |
| 30 | Transport Equipment | 1.82 | 2.19 | 2.06 | 2.04 | 1.21 | 1.3 | 1.74 | 1.96 |
| 31 | Furniture | 0.11 | 0 | 0 | 0 | 0.27 | 0.52 | 0.12 | 0.11 |
| 32 | Other Manufacturing | 2.15 | 2.3 | 1.09 | 1.22 | 1.48 | 1.82 | 1.74 | 1.9 |
| 33 | Repairs and Installations | 1.1 | 1.2 | 0.49 | 0.82 | 0 | 0 | 0.71 | 0.84 |
| | Manufacturing | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

*Note*: (1): %share of number of domestic mergers to total mergers
*Note*: (2): %share of value amount of domestic mergers to total mergers
*Note*: (3): %share of number of inbound mergers to total mergers
*Note*: (4): %share of value amount inbound mergers to total
*Note*: (5): %share of number outbound mergers to total
*Note*: (6): %share of value amount of outbound mergers to total
*Note*: (7): %share of mergers to total
*Note*: (8): %share of value of mergers to total

Table A.2: Summary Statistics of Key Model Variables for HT&MT sector firms

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| R&D Intensity | 3,262 | 0.0121 | 0.0240 | 0.0000 | 0.1127 |
| Technology-Licensing Intensity | 3,262 | 0.0034 | 0.0092 | 0.0000 | 0.0553 |
| # M&As (Cumulative) | 3,262 | 1.7452 | 2.9197 | 0.0000 | 30.0000 |
| (Log) Value of M&As (Cumulative) | 3,262 | -6.0247 | 2.8413 | -6.9078 | 7.6009 |
| Size | 3,262 | 8.4713 | 1.6416 | 3.4904 | 13.5192 |
| Age | 3,262 | 38.0199 | 20.3118 | 8.0000 | 98.0000 |
| Profit Margin | 3,262 | 0.0357 | 0.2345 | -1.6959 | 0.3906 |
| Export Intensity | 3,262 | 0.1750 | 0.2387 | 0.0000 | 0.9829 |
| Capital Goods Import Intensity | 3,262 | 0.0129 | 0.0317 | 0.0000 | 0.2281 |
| Technology Import Intensity | 3,262 | 0.0165 | 0.0336 | 0.0000 | 0.2286 |
| CBM&A Inward FDI (dummy) | 3,262 | 0.2201 | 0.4144 | 0.0000 | 1.0000 |
| CBM&A Outward FDI (dummy) | 3,262 | 0.2937 | 0.4555 | 0.0000 | 1.0000 |
| Horizontal/Vertical M&As (dummy) | 3,262 | 0.4353 | 0.4959 | 0.0000 | 1.0000 |

Table A.3: First-Stage Diagnostics for IV Models

| | Dependent Variable | |
|---|---|---|
| | # M&As (Cumulative) | (Log) Value of M&As (Cumulative) |
| | (1) | (2) |
| L.# M&As (Cumulative) | 1.0424*** | |
| | (0.0068) | |
| L.(Log) Value of M&As (Cumulative) | | 0.9603*** |
| | | (0.0056) |
| ***Control Variables*** | **Controlled** | **Controlled** |
| N | 2,979 | 2,979 |
| $\chi^2$ statistic | $2.39 \times 10^4$ | $3.04 \times 10^4$ |
| Prob $> \chi^2$ | 0.0000 | 0.0000 |

*Note*: ***p<0.001, **p<0.01, *p<0.05

*Note*: Unless otherwise mentioned, values in brackets are standard errors

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Centre for Development Studies
Prasanth Nagar, Ulloor,
Thiruvananthapuram 695 011
Kerala, India
Phone: +91 471 2774200
Website: www.cds.edu

*For Publication Contact*
E-mail: publication@cds.edu