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Article

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Article

Cross-Border Acquisitions and Shareholders' Wealth: The Case of the Indian Pharmaceutical Sector

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Abstract: Cross-border acquisitions by Indian companies have increased tremendously, especially during the last two decades, and the pharmaceutical industry is one of the top acquiring industries. This study verifies the relationship between cross-border acquisitions and shareholders' wealth in the Indian pharmaceutical sector. For this purpose, the data related to acquisitions were acquired from 2005 to 2019 and the event study methodology was applied along with two parametric tests. The findings of the current research prescribe that cross-border acquisitions have a positive and significant impact on shareholders' wealth. Furthermore, the outcomes also indicate higher positive abnormal returns in the short run when the targets are based in the US and the UK as compared to the positive but insignificant abnormal returns when the targets are based in locations other than the US and the UK.

Keywords: pharmaceutical firms; cross-border acquisitions; mergers and acquisitions; abnormal returns; event study methodology; short term gains; India

JEL Classification: C58; G34; G14



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1. Introduction

A merger is a settlement that merges two existing businesses into one new corporation. There are different kinds of mergers and different reasons why corporations' complete mergers. Mergers and acquisitions (M&A) are normally done to enlarge a corporation's reach, increase into new sections, or gain market share. All of these are completed to increase a shareholder's worth. Frequently, throughout a merger, corporations have a no-shop clause to stop purchases or mergers by additional corporations. M&A are the utmost realistic way to speed up the growth enactment plan of companies. All industries have been using M&A as an aggressive strategy for growth. M&A are not a new notion and burst in M&A has given further space to companies to look for integration for their growth, market coverage, or any other strategic requirement. In the last two decades, a tremendous growth has been noticed in M&A transactions both in developed and emerging markets (Wajid et al. 2020). The following countries, Brazil, Russia, India, China, and South Africa, are jointly known as BRICS and often considered as a best representative of emerging market economies. According to Phiri (2018), the BRICS members contribute to nearly 40% of the world's population and account for 40% of the world's total foreign reserves which is quite a huge participation. In terms of M&A, the firms from BRICS members collectively represent over 60% of the total M&A in emerging markets (Kinateder et al. 2017). They have also reported huge investments across the borders, especially in developed markets

(Wajid and Singh 2022). This phenomenon is vital for Emerging Market Multinationals (EMMs) as it provides them rapid access to new territories, resources, and capabilities.

The growth of multinational firms from emerging markets is a phenomenon that has caught considerable attention by researchers as it has significant theoretical and empirical implications (Buckley et al. 2014). They have been actively engaging in cross border M&A and have made their own internationalization strategy. In fact, scholars emphasized that cross-border acquisitions (CBA) by emerging market corporations are considered as the main and central source of entry into other developing and developed countries (Rani et al. 2016; Tao et al. 2017).

There are several studies that have observed and pointed out the motivation and encouragement behind international acquisitions by EMMs. For instance, Hopkins (1999) explained that the growth is the primary motivation behind CBA. Similarly, Aybar and Fici (2009) deliberated that the emerging market corporates engage in CBA due to aggressive competition from domestic as well as multinational corporations operating in their markets. In addition, Rabbiosi et al. (2012) deliberated that the dire need to have an international experience is a motivation for BRICS members to pursue foreign acquisitions. Similarly, Deng and Yang (2015) found the evidence to suggest that the firms from BRICS members can predominantly enter acquisitions to gain global recognition and they further indicated that the CBA assists in acquisition of critical resources.

The corporate sector in India over the past two decades has been drastically restructuring its operations by adopting both organic and inorganic routes (Wajid and Singh 2022). Globalization compelled the companies to look for competitive advantages which are leading to an extraordinary surge in M&A activities. The liberalization of trade policies and removal of trade barriers have acted as facilitators in intensifying consolidation activities in India (Wajid et al. 2019). Today, acquisition across boundaries has become a fundamental attribute of a company. However, the studies on CBA are limited in the Indian context.

An incredible development has been observed in M&A deals beyond the borders. Though it has long been understood that globalization for several decades operated by worldwide corporations from developed markets, currently the corporations from developing markets have stated enormous investments across their national borders by acquiring foreign firms. CBA by Indian companies have augmented tremendously, particularly during the last two decades, and the pharmaceutical industry is one of the top attaining industries (Wajid and Singh 2022). The industry CBA by Indian companies is provided below in Figure 1. A total of 19 industries have been classified by the Venture Intelligence database as mentioned in Figure 1. The maximum number of CBA was reported by Information Technology and Information Technology-Enabled Services Industry (IT and ITES) followed by the manufacturing industry (i.e., automobiles, auto components, cement, chemicals, industrial machinery, steel, etc.) and the pharmaceutical industry. A total of 1764 CBA were reported during 2005 to 2017, out of which 197 acquisitions were reported in pharmaceutical industry. It is also observed that the majority of the targets were unlisted companies.

The present study is focused on Indian firms, more precisely on the Indian pharmaceutical industry. India is among the fastest growing economies and has been maintaining high growth rates for the last two decades (Paul and Mas 2016). Indian pharmaceutical firms are one of the best representations of “emerging market multinationals” (Bruche 2012). The significance of the Indian pharmaceutical sector is briefly explained under the next section of the study. The Indian pharmaceutical industry represents 10% and 2.5% of the global pharmaceutical industry in volume and value terms (IBEF 2019), respectively. The healthcare sector in India is among the highest growing sectors and is expected to grow at a Compound Annual Growth Rate of 17% from 2008 to 2020.¹ The Indian pharmaceutical industry stands tall as a supreme leader in applying for Drug Master Files (DMFs) with the US. India has a competitive edge over the other developed markets because of its significantly low cost of production². The generic drugs have the largest share in the Indian pharmaceutical sector, and it accounted for nearly 70% of revenue. India is the global leader

in exporting generic medicines, and accounts for 20% of global generic exports, while the US is the biggest importer of the Indian pharmaceutical sector (Indian Brand Equity Foundation 2017)³.

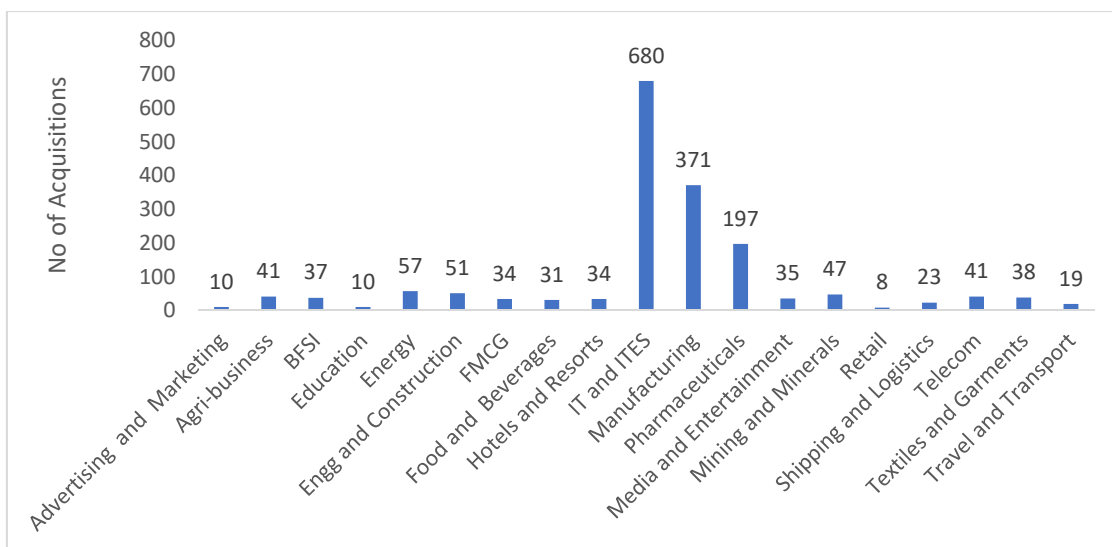


Figure 1. Industry wise CBA during 2005 to 2017. Source: Venture Intelligence database.

In the pharmaceutical industry, the companies can survive only by acquiring capabilities that they do not possess. In the rapidly changing drug discovery industry, the companies secure their future by expanding and redefining competencies in technology and competition (Amir-Aslani and Chanel 2016). Indian pharmaceutical firms can acquire external knowledge and the latest and contemporary knowledge from their alliances and acquisitions in western countries (Bower and Sulej 2006). Synergistic CBA create value through asset sharing, financial diversification, and reverse internalization (Seth et al. 2002). A study by Amir-Aslani and Chanel (2016) expounded that CBA by Indian pharmaceutical companies provide them easy and fast access in other geographical areas, strong balance sheets, and latest know-how of drugs modules. Higgins and Rodriguez (2006) underlined that overcoming deteriorating R&D is the motivation behind pharmaceutical firm’s urge to acquire research-intensive firms. According to Hopkins (1999), the three most important objectives behind acquiring a foreign company are efficiency in operations, managing risks, and innovation. Governance systems also play a significant role in value creation to bidders; bidders of countries with group-oriented governance systems get higher value creation than bidders of countries with market-oriented governance systems (Seth et al. 2002).

The current study was undertaken to examine the impact of CBA on the wealth of the shareholders. It has been observed from the review of literature that the studies which examine the impact of M&A activities on the wealth of shareholders were largely based on advanced markets, for example, the US, the UK, and Germany (Rani et al. 2016). Furthermore, a few management studies in India analyzed the short-term abnormal return to shareholders. However, an in-depth study on acquisitions by pharmaceutical firms considering aspects of the deals, specifically mode of deal (Heron and Lie 2002), geographical location of targets (Goergen and Renneboog 2004), and acquisition stake (Chari et al. 2010; Chen 2008) has not received much attention in Indian CBA literature. It would be interesting to analyze these aspects to understand the characteristics and outcomes of deals in a better and up-to-date manner. These kinds of concerns are the motivations to answer the two questions. First, do acquirers of Indian pharmaceutical firms experience positive abnormal returns surrounding the announcement of CBA? Secondly, do shareholders get higher returns when targets are based in developed countries, especially in the US and the UK? These two research questions are answered by considering 24 CBA by Indian pharmaceutical companies during the years 2005 to 2017, only 100% stake through acquisitions

and transactions involving a cash payment have been considered for the present study. According to outcomes of the study, there is a direct and significant association between CBA and shareholder wealth.

The study has theoretical, practical, and empirical significance. It contributes meaningfully to literature. Similarly, this research finds the affinity empirically between explained and explanatory variables. Moreover, it suggests practical implications which help investors or managers regarding their decisions. The pharmaceutical industry is chosen because of its global nature and extensive engagement in acquisition activities. These firms have been on a CBA spree since 2005 (Srivastava and Prakash 2014; Pathak and Nathani 2021). According to IBEF (2019), the Indian pharmaceuticals were involved in more than 70% of all M&A in India over the last three years. This under-analyzed industry is significantly different from other industries because of its inflated costs of drug development, low rate of success and lastly, this industry tends to engage in acquisitions of companies that have high potential to generate revenue. With all these characteristics, this industry has the potential to have broader applicability (Hassan et al. 2007).

The entire study is divided into six sections. Section 1 describes the overview of CBA and the Indian pharmaceutical sector. Section 2 discusses the theoretical background, review of literature and development of the hypothesis. Section 3 deals with the data, research methodology, and variables. Sections 4 and 5 illustrate the results and discussion, respectively. Section 6 draws the conclusion, policy recommendations, limitations, and future scope of the research.

2. Theoretical Background and Review of Literature

The theoretical framework of the present study discusses several theories that explain the internationalization of the firms. These theories are previously published on cross-border M&A from the view-point of the acquirer firm, and provide a background on the entry of the firms into foreign markets.

Past studies suggest two theories, i.e., Dunning's Eclectic paradigm and the Uppsala Model, and have contributed immensely towards the theoretical foundation of CBA research (Dunning 1993; Mathews 2006). Dunning's eclectic paradigm explains that the firm will only engage in foreign deal when it has ownership (O), locational (L), and internalization (I) advantages that are commonly called OLI advantages (Dunning 1993, 2000). According to Caves (1971) the ownership advantages are unique, competitive, and monopolistic advantages such as patents, or any other strategic asset, that a firm acquires from domestic markets which can assist it to compete with other firms in the foreign markets. Similarly, locational specific advantages of target firms such as human resources, natural resources, and latest technology make them attractive for investment purposes (Dunning 1993), internalization advantages typically relate to industry, arise from embracing means and practices that internalize the ownership advantages rather than marketing directly to foreign countries. However, the insufficiency of the eclectic paradigm in describing the motivations of the firms originating from emerging markets have been emphasized by many studies (Child and Rodrigues 2005; Mathews 2006).

The Uppsala model by Johanson and Vahlne (1977) explains the internationalization phenomenon of the emerging multinational enterprises (EMNE). The theory mainly stresses two concepts on which the company usually tends to internationalize. The first concept says that the firms choose to enter into a foreign market that is close to the domestic market in terms of psychic distance, this helps the firms to overcome their liability of foreignness. Secondly, this theory suggests that the firms internationalize through a stage-wise process (Hemais 2004). The study by Mathews (2006) observed that EMNE sometimes leapfrog various stages of internationalization and he further introduced the concept of linkage, learning, and leverage model (LLL). Basically, it was observed that the firms from emerging markets seek to acquire strategic assets by using collaboration activities with foreign firms in form of joint ventures, strategic alliances, etc. to augment their weak ownership advantages. Additionally, bandwagon theory explains that the firms tend to

imitate the actions of their close rivals even when the imitation does not lead to value enhancement. This theory is basically focused on external factors and is concentrated on the relationship between the behavior of the close competitors and the behavior of the firm (Pangarkar 2000). The major theories of internationalization of the firms are discussed above. However, in addition to these theories, there are many other theories that explain the internationalization of the firms; for instance, theory of transaction costs, theory of institutional constraints, capabilities driven framework, agency theory, etc. By relating these theoretical viewpoints and taking references from other studies, for instance (Buckley et al. 2007; Pradhan and Singh 2011; Jayanthi et al. 2016), the present study examines the relationship between CBA and shareholder wealth in the Indian pharmaceutical sector.

The literature on the short-term changes of shareholder's wealth surrounding M&A is in abundance. Though most of the studies were done in developed nations, the authors focus on the literature review of studies primarily on the short-term returns to acquirer firm shareholders. According to the results, the studies were separated into two sections. The first section discusses the studies which reported positive abnormal returns to the shareholders on the announcement of the M&A while the second section discusses the studies which reported negative abnormal returns to the shareholders on the announcement of the M&A.

If global capital and dominant markets are efficiently consolidated, one could presume there to be no organized variations in the irregular returns to either targets or acquirers in cross border transactions as compared to native acquisitions (Harris and Ravenscraft 1991). In contrast, a hypothesis of efficiently unified markets is questionably impracticable, and there are both theoretical queries and previous empirical indications to recommend that the degree of irregular outputs may fluctuate systematically between cross-border and native acquisitions. The prior work is, however, contradictory, with different queries put forward as to whether CBA can be predictable to increase or decrease the shareholder's wealth, and whether the wealth influences of cross border transactions will be bigger or smaller than in domestic acquisitions. The beyond-border acquisitions can be anticipated to be vaguer, and thus further expensive and hazardous to execute, than native acquisitions. The capacity for valuation error might be a more severe problem in beyond border than native acquisitions (Conn and Connell 1990).

In a recent study, Wajid and Singh (2022) examined the CBA by Indian pharmaceutical firms by taking a sample size of 55 transactions from 2005 to 2019 and found evidence of positive abnormal returns to the shareholders in the short run. Similarly, the CBA by firms of emerging economies create value for the acquiring firm shareholders from the beginning on the day of announcement of the acquisition. Further, the acquirer experiences high returns when there is better corporate governance in the target firms' country (Bhagat et al. 2010). Likewise, Hassan et al. (2007) examined 405 cross-border M&A deals by US-based pharmaceutical companies from 1981 to 2004. Additionally, their study suggested that there is an increase in shareholder wealth due to M&A. Cakici et al. (1996) examined 195 foreign acquisitions in the US from 1983 to 1992. Moreover, their study found positive and significant returns over $(-10, 10)$ event windows to the shareholders of bidder firms. They were also of the view that there was no influence on the abnormal return of bidders due to target or bidder relatedness, overseas exposure, R&D intensity, industry factor, and the foreign currency value. Likewise, Wang and Boateng (2007) explored the performance of CBA by Chinese firms during 2000 to 2004, suggesting that the CBA created value for Chinese bidder firms in the short run. Additionally, Higgins and Rodriguez (2006) examined 160 acquisitions by pharmaceutical companies from 1994 to 2001, stating that on an average there were significant positive returns to the acquirers. The above-mentioned studies help to hypothesize that

H1. *Indian pharmaceutical acquiring firms' shareholders experience positive abnormal returns in the short run on the announcement of CBA.*

Aybar and Ficici (2009) explored 433 M&A announcement deals, involving 53 EMMs, using event study methodology concluded that on average, CBA by EMMs were value destroyers for shareholders. Further, they asserted that the difficulties of CBA, i.e., inadequate market information, may be aggravated if the bidding company has no prior processes in the target state, while Conn and Connell (1990) debated that companies from highly competitive dominant markets, such as the US can be projected to have further acquisition knowledge and do better acquisitions. A study done on UK bidders from 1991 to 1996 reported that the shareholders of UK firms experienced negative abnormal returns when UK firms acquired large targets in Europe and the US; however, UK firms experienced positive abnormal returns when they acquired firms in the UK (Aw and Chatterjee 2007). Similarly, Corhay and Tourani (2000) investigated 84 CBA deals by Dutch firms during 1991–1996 and stated weak evidence of the wealth creation aspect of CBA, especially for an acquisition that held in the US. Saini and Singla (2015) analyzed 50 CBA deals of the Tata group of companies from 2000 to 2010, stating a downward trend in shareholder wealth during the 59-day event window. Likewise, Srivastava and Prakash (2014) analyzed 30 cross-border M&A by Indian pharmaceutical firms, indicated that shareholders experience negative returns following the announcement of M&A events, and concluded that the market does not respond positively following the M&A announcement.

From the review of literature, it is evident that CBA announcement results on shareholder's wealth creation vary across countries and industries. However, there are more published studies which support that the acquirers experience positive abnormal returns when pharmaceutical firms engage in CBA (Wajid and Singh 2022; Hassan et al. 2007; Higgins and Rodriguez 2006). Additionally, M&A by Indian pharmaceuticals increased remarkably in the last decade, and they have become an essential feature. It has been observed from the data that most of the acquisitions by Indian pharmaceutical firms are in the developed market more specifically in the US and followed by the UK, therefore the hypothesis is as follows.

H2. *Acquisitions of US and UK targets generate higher abnormal returns in the short run for the shareholders of Indian acquiring pharmaceutical firms.*

3. Research Methodology

The acquisition activity in the Indian pharmaceutical industry shows an unprecedented growth from 2005 to 2017, the year-wise distribution of the deals can be seen below in Figure 2. The period of this study was chosen for a few reasons. First, the enactment of the product patent act in 2005; second, there was a sharp increase in the global expansion activities of Indian pharmaceutical firms during the sample period (Srivastava and Prakash 2014); third, the acquisition after 2017, i.e., in 2018 and 2019 did not qualify for the inclusion because they do not fall under the sample as per the sample selection criteria selected for the current study and lastly, after 2019, because of the pandemic (COVID-19), not many cases of CBA were reported by Indian pharmaceutical industry. There was a total of 45 complete acquisition transactions, mostly involving cash as a mode of payment. It is also important to note that most of the acquisitions by Indian pharmaceutical firms were reported in the US followed by the UK during the period of the study. However, only 24 transactions were suitable for analysis, due to data deficiency and other confounding effects (the details are highlighted in the Appendix A as Table A1 at the end of the paper).

The study employs 24 transactions for overall evaluation, 12 transactions involving targets in the US and the UK. The authors restrict the analysis to Indian acquiring pharmaceutical firms. All the target companies that were selected for the study were unlisted companies and were totally cash financed. Additionally, the transactions considered for evaluation were completely acquired. It is also noticed that in several cases, the deal value was not disclosed publicly. Contrary to the domestic acquisitions, stock payments are rarely used for CBA (Rani et al. 2016). The present study used CMIE PROWESS database to compile the data for the study. Event study methodology was utilized to analyze short-run

abnormal returns surrounding an announcement of acquisitions considering (−10, 10) event window. Short-term event windows were examined since long-term event windows influence the power of statistical tests and may lead to false outcomes (Brown and Warner 1980). Furthermore, there may be a problem related to the control of confounding events (Rani et al. 2016).

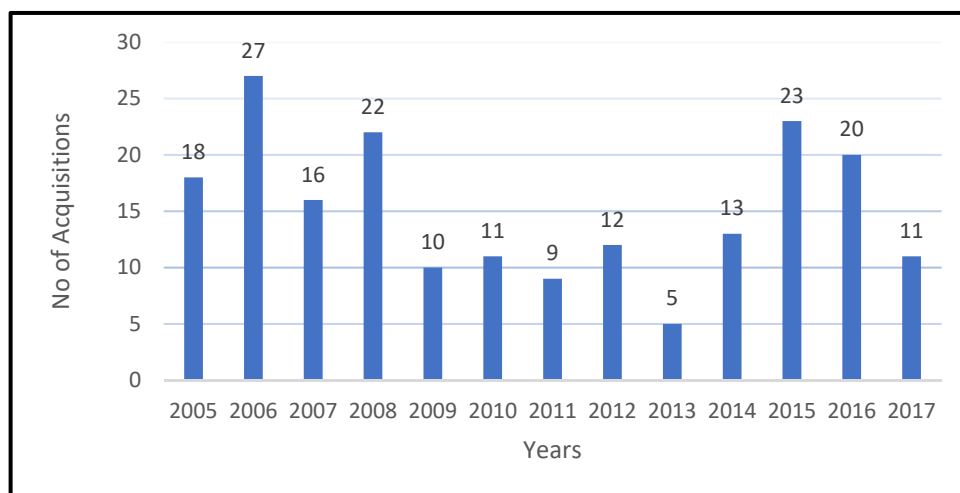


Figure 2. CBA by Indian pharmaceutical firms from January 2005 to December 2017. Source: Compiled from CMIE Prowess IQ database.

The event study methodology has overwhelmingly widespread usage in modern day financial research. It is one of the most useful instruments to analyze announcement-related stock price performance (Kliger and Gurevich 2014). The prerequisite of this methodology is to outline an event, the day the event is announced to the public. The authors define Day 0 as the acquisition announcement day, verified from the CMIE PROWESS database. Event study methodology assumes that there should not be any confounding event in the event window, therefore, the authors manually checked and excluded the samples by following criteria:

- The announcement of multiple acquisitions in the event window.
- Where less than 100% acquisition was done.
- Acquisitions by pharmaceutical companies that are not listed on BSE.
- Acquisitions that were financed by stock.
- Firms whose daily price information was not available.

Adjusted closing prices of securities were taken from Yahoo finance and Index data were collected from the BSE website. The authors used an estimation period which starts 200 days prior the announcement of the event and ends 21 days prior to the announcement of the event (Uddin and Boateng 2009). The normal return was calculated by the market model (Fama et al. 1969). The basic assumption of this methodology is that prices of securities adjust themselves to any additional information available to the public. The “market model” predicts the normal return of a security, taking into consideration market return and the firm’s prior relationship with the market (Uddin and Boateng 2009). This study employs event study described by (Kliger and Gurevich 2014) and considered a pre-event study period for estimation, which is consistent with many studies concentrated on CBA (Aw and Chatterjee 2007; Conn and Connell 1990).

The market model equation to estimate normal return is described as follows:

$$R_t^j = \alpha_j + \beta_j R_t^m + \epsilon_t^j \tag{1}$$

R_t^j is the return of stock ‘j’, period t .
 R_t^m is the return from market, period t .

α_j & β_j are parameters of the model.
 ε_t^j is the error term.

The abnormal return for stock j at period t is calculated as:

$$AR_t^j = R_t^j - (\alpha_j + \beta_j R_m^t) \tag{2}$$

The AR_t^j shows the abnormal return of stock ' j ' for period t .

The R_t^j means return of stock ' j ' for period t .

The R_m^t is market return for period t .

The α_j and β_j are estimated parameters.

Average abnormal return is defined as

$$AAR_t = \frac{\sum_{t=1}^n AR_t^j}{N} \tag{3}$$

where N denotes number of firms.

The Cumulative Average Abnormal Return (CAAR) describes the end results of the study and provides values for arriving at a conclusion related to market reaction to the event (Kliger and Gurevich 2014). CAAR from period " s " to " t " is:

$$CAAR_{s,t} = \sum_{\tau=s}^t AAR_{\tau} \tag{4}$$

Test statistics enable to arrive at T-statistics and p -value, it is computed as follows:

$$TS = CAAR_{s,t} / \hat{\sigma}_{s,t}^{CAAR} \tag{5}$$

This study also demonstrated the use of two parametric tests to assess the robustness of CAARs. First are "Cross Sectional Standard Deviation test" (CSSD) and the other is Patell Z test. A brief explanation of both the tests is given below.

3.1. Cross-Sectional Standard Deviation Test (CSSD)

This test considers a daily cross-sectional "standard deviation" and does not rely on sample time series standard deviation (Rani et al. 2016). Further, Brown and Warner (1985) suggested that the "cross-sectional test" is prone to event-induced volatility.

The test statistics is given below:

$$T_{cross} = \frac{CAAR_{T_1,T_2}}{\hat{\sigma}_{CAAR(T_1,T_2)} / \sqrt{N}} \tag{6}$$

where the variance of $CAAR(T_1, T_2)$ is given below:

$$\hat{\sigma}_{CAAR(T_1,T_2)}^2 = \frac{1}{N-1} \sum_{i=1}^N (CAR_{i,T_1,T_2} - \frac{1}{N} \sum_{j=1}^N CAR_{j,T_1,T_2})^2 \tag{7}$$

3.2. Patell Z Test

Patell (1976) developed this test, and it is also known as 'Standardized Residual test'. It assumes constant variance and zero correlation in the abnormal returns. Under this test, first the abnormal returns need to be standardized by the "standard deviation" of the estimation period abnormal returns. For each security, the standardized abnormal returns are calculated as per below equation.

$$SAR_{i,t} = \frac{AR_{i,t}}{S_{AR_{i,t}}} \tag{8}$$

$S_{AR_{i,t}}$ is the “standard deviation” of the estimation period abnormal returns.

As the event-window abnormal returns are out-of-sample predictions, Patel Z adjusts the “standard error” by the forecast-error as per the below equation.

$$S_{AR_{i,t}}^2 = S_{AR_i}^2 \left(1 + \frac{1}{M_i} + \frac{(R_{m,t} - \bar{R}_m)^2}{\sum_{t=T_0}^{T_1} (R_{m,t} - \bar{R}_m)^2} \right) \tag{9}$$

where \bar{R}_m is the mean of market returns in the estimation window.

$$Patel\ Z = \frac{1}{\sqrt{N}} \sum_{i=1}^N \frac{CSAR_i}{S_{CSAR_i}} \tag{10}$$

And

$$CSAR = \sum_{t=T_1+1}^{T_2} \frac{CSAR_i}{S_{CSAR_i}} \tag{11}$$

where $CSAR_i$ is cumulative standardized abnormal returns and S_{CSAR} is “standard deviation” of cumulative standardized abnormal returns.

4. Results

This section reports and describes the results of the current study which were acquired through the statistical technique called event study methodology. Table 1 shows the day wise CAARs, test statistics, and *p*-value for all the 24 samples selected for this study. Among them, 12 acquisitions were reported in the US and the UK while the remaining 12 were reported in regions other than the US and the UK. It can be seen in Table 1 that the day-wise CAARs were analyzed from 10 days before the announcement of acquisitions until 10 days after the announcement of acquisitions. There was a slightly an increasing trend in CAARs just after the acquisition announcements, though it started declining after day 5. CAARs increased up to 2.98% on 5th day post acquisition announcement although not significantly according to the *t*-test.

Table 1. Cross-border acquisitions.

Days	AARs	CAARs	T-Test	p-Value
−10	0.66%	0.66%	1.05	0.29
−9	−0.25%	0.41%	0.46	0.64
−8	0.04%	0.45%	0.41	0.67
−7	0.00%	0.45%	0.35	0.72
−6	0.48%	0.93%	0.66	0.50
−5	−1.06%	−0.13%	−0.08	0.93
−4	0.32%	0.19%	0.11	0.91
−3	0.33%	0.52%	0.29	0.77
−2	0.13%	0.65%	0.34	0.72
−1	−0.12%	0.53%	0.26	0.78
1	1.00%	1.53%	0.73	0.21
2	0.97%	2.50%	1.15	0.25
3	0.28%	2.78%	1.23	0.22
4	−0.53%	2.25%	0.96	0.33
5	0.73%	2.98%	1.23	0.22
6	−0.19%	2.79%	1.11	0.26
7	−0.08%	2.71%	1.05	0.29
8	−0.75%	1.96%	0.73	0.46
9	−0.55%	1.41%	0.51	0.61
10	0.31%	1.72%	0.61	0.54

Source: Authors’ own calculations.

Figure 3 shows CAARs for all 24 companies during (−10, 10) days surrounding the announcement of acquisitions. It is clear from Figure 3 that shareholders’ wealth increased

up to 2.8% following acquisition announcements. The positive wealth effects were seen up to the last day of the event window.

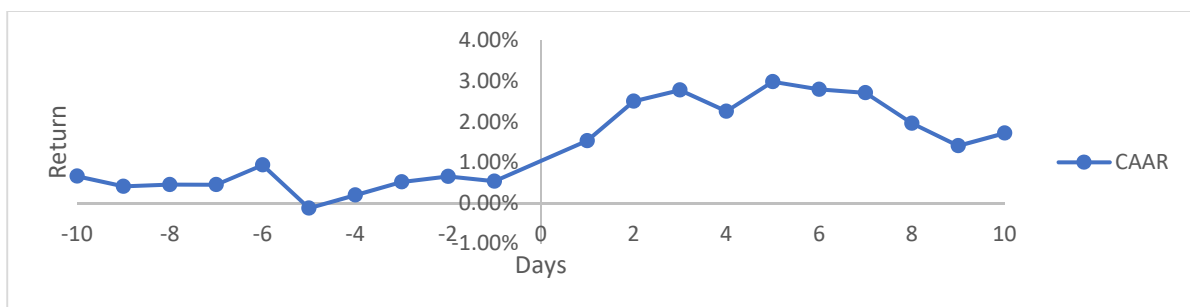


Figure 3. Cross-border acquisitions. Source: Authors’ own calculation.

In addition to the *t*-test, the present study also used two parametric tests to examine the CAARs in multi-event windows. Table 2 below presents the result of these two parametric tests, i.e., “Cross Sectional Standard Deviation test” (CSSD) and “Patell Z test”. It can be inferred from the table that investors earned up to 2.59% abnormal returns during (−3, 3) event window. The CAARs are positive and statistically significant for all the event windows analyzed in the study. Though the highest abnormal returns were earned in (−3, 3) event window, i.e., the investors who purchased the shares three days before the acquisition and sold them three days after the acquisition earned the highest returns. It is important to note that the CAARs are positive but not statistically significant under *t*-test as reported in Table 1 above where day-wise analysis is done. Nevertheless, they are significant under multi-event windows as confirmed by both the parametric tests. Therefore, the results support hypothesis 1 that says Indian pharmaceutical acquiring firms’ shareholders experience positive abnormal returns in the short run on the announcement of CBA.

Table 2. Results of parametric tests.

Date	CAAR	CSSD	Prob	Patell Z	Prob
(−10 ... 10)	1.72%	1.894	0.050 ^b	1.789	0.078 ^a
(−5 ... 5)	2.05%	2.241	0.022 ^b	2.143	0.032 ^b
(−3 ... 3)	2.59%	2.658	0.007 ^c	2.543	0.017 ^b
(−2 ... 2)	1.98%	2.031	0.041 ^b	2.004	0.032 ^b

Note: Prob denotes *p*-value, ^{a,b,c} denote significance at 10%, 5% and 1%, respectively.

Table 3 below shows day-wise CAARs, test statistics, and *p*-value when targets are based either in the US or in the UK. CAARs started increasing 3 days before the acquisition announcements and show an increasing trend up to 7th day post acquisition announcement. CAARs increased up to 7.10% on day 5, and are positive and statistically significant on day 2, day 3, day 4, day 5, day 6, and day 7 under *t*-test.

As can be seen in Figure 4 below, there is a sharp increment in CAARs until day 5, after which it becomes somewhat constant for three days and then starts decreasing. The impact of acquisition announcements is longer and larger in case of acquisition announcements of firms that belong either to the US or to the UK.

As explained above, the present study also demonstrated the use of two parametric tests in addition to *t*-test to examine the CAARs in multi-event windows. Table 4 below exhibits the results of these two parametric tests i.e., “Cross Sectional Standard Deviation test” (CSSD) and “Patell Z test”. Table 4 revealed that investors earned up to 6.97% abnormal returns during (−3, 3) event window. Interestingly, the CAARs are positive and statistically significant for all the event windows analyzed in the study. Though the highest abnormal return was earned in (−3, 3) event window, i.e., the investors who purchased

the shares three days before the acquisition and sold them three days after the acquisition earned the highest returns.

Table 3. Cross-border acquisitions in the US and UK.

Days	AARs	CAARs	T-Test	p-Value
-10	-0.36%	-0.36%	-0.37	0.7
-9	-0.07%	-0.43%	-0.31	0.75
-8	0.01%	-0.42%	-0.25	0.8
-7	-1.02%	-1.44%	-0.75	0.45
-6	1.65%	0.21%	0.09	0.92
-5	-0.19%	0.02%	0.01	0.99
-4	-0.10%	-0.08%	-0.03	0.97
-3	1.31%	1.23%	0.45	0.65
-2	0.39%	1.62%	0.56	0.57
-1	1.31%	2.93%	0.96	0.33
1	1.64%	4.57%	1.43	0.15
2	1.29%	5.86%	1.76	0.07 ^a
3	1.03%	6.89%	1.99	0.04 ^b
4	-1.03%	5.86%	1.63	0.09 ^a
5	1.24%	7.10%	1.91	0.04 ^b
6	-0.73%	6.37%	1.66	0.09 ^a
7	0.36%	6.73%	1.7	0.09 ^a
8	-1.38%	5.35%	1.31	0.18
9	-0.48%	4.87%	1.16	0.24
10	0.11%	4.98%	1.16	0.24

Source: Authors' own calculations; ^{a,b} denote significance at 10% and 5%, respectively.

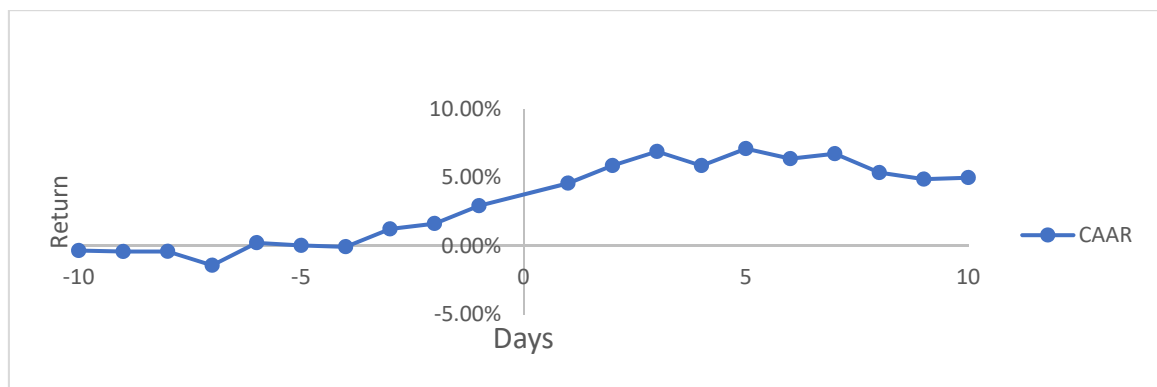


Figure 4. Cross-border acquisitions in US and UK. Source: Authors' own calculation.

Table 4. Results of parametric tests (US and UK).

Date	CAAR	CSSD	Prob	Patell Z	Prob
(-10 ... 10)	4.98%	3.201	0.009 ^c	3.121	0.002 ^c
(-5 ... 5)	6.89%	4.101	0.000 ^c	4.012	0.000 ^c
(-3 ... 3)	6.97%	4.211	0.000 ^c	4.131	0.000 ^c
(-2 ... 2)	4.63%	3.105	0.011 ^b	2.970	0.014 ^b

Note: Prob denotes p-value, ^{b,c} denote significance at 5% and 1%, respectively.

Table 5 below displays day-wise AARs, CAARs, t-test statistics, and p-value for CBA other than in the US and the UK. It is observed from the table that the CAARs started to increase post the announcement of acquisitions and increased up to 1.2% on day 2. It is also noticed that the CAARs were positive for all the days selected for the study; however, they were not statistically significant under t-test.

Table 5. Cross-border acquisitions other than in the US and UK.

Days	AARs	CAARs	T-Test	p-Value
-10	0.51%	0.51%	0.30	0.13
-9	-0.35%	0.16%	0.39	0.22
-8	0.03%	0.19%	0.11	0.37
-7	0.01%	0.20%	0.15	0.41
-6	0.48%	0.68%	1.01	0.34
-5	-0.11%	0.57%	0.30	0.51
-4	0.32%	0.89%	0.58	0.52
-3	-0.23%	0.66%	0.34	0.36
-2	0.12%	0.78%	0.30	0.40
-1	-0.10%	0.68%	0.41	0.51
1	0.31%	0.99%	1.12	0.19
2	0.21%	1.20%	1.20	0.15
3	-0.30%	0.90%	0.37	0.34
4	-0.16%	0.74%	0.26	0.33
5	0.13%	0.87%	0.35	0.22
6	-0.09%	0.78%	0.36	0.41
7	-0.13%	0.65%	0.41	0.39
8	0.15%	0.80%	0.30	0.28
9	-0.02%	0.79%	0.41	0.32
10	0.12%	0.91%	0.20	0.40

As seen in Figure 5, there was somewhat of an increment in CAARs up to day 2, after which it started decreasing and then, it was slightly constant and the CAARs were positive throughout the time period selected for the study.

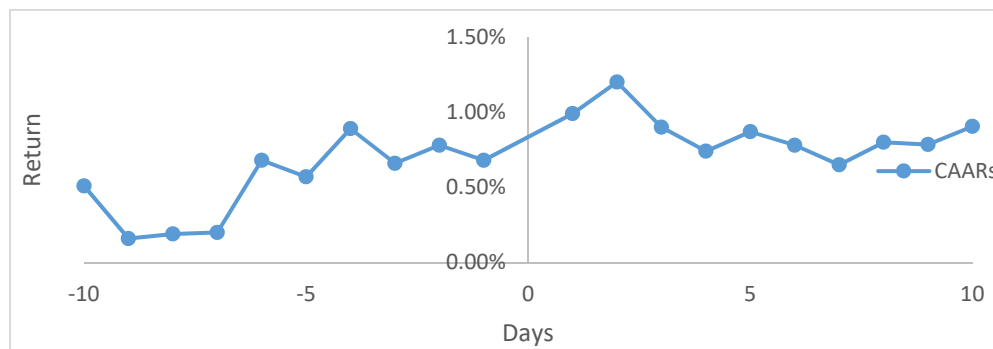


Figure 5. Cross-border acquisitions other than in the US and UK. Source: Authors’ own calculation.

As the authors demonstrate the use of two parametric tests above, the same tests are used to analyze the significance of CAARs for acquisitions other than in the US and the UK. The results of the tests are seen in Table 6. Although the CAARs were positive, they were not statistically significant under any of the parametric tests.

Table 6. Results of parametric tests (other than the US and UK).

Date	CAAR	CSSD	Prob	Patell Z	Prob
(-10 ... 10)	0.91%	1.011	0.211	1.76	0.231
(-5 ... 5)	0.19%	0.213	0.712	0.81	0.311
(-3 ... 3)	0.01%	0.003	0.991	-0.09	0.901
(-2 ... 2)	0.54%	0.187	0.21	0.143	0.817

Finally, the authors tested the differences in the mean CAR (cumulative abnormal returns) of acquirers of companies in the US and the UK and mean CAR of acquirers of companies other than in the US and the UK using independent sample *t*-test as demonstrated

by Rani et al. (2016). It is noticed in Table 7 that the difference of means is positive and significant in three event windows i.e., in $(-5 \dots 5)$, $(-3 \dots 3)$ and $(-2 \dots 2)$. The result of the test signifies that the shareholders earned higher and significant abnormal returns when the Indian pharmaceutical firms acquired targets in the US and the UK as compared to the acquisitions of targets other than in the US and the UK. Therefore, the results support hypothesis 2 that says acquisitions of the US and the UK targets generate higher abnormal returns in the short run for the shareholders of Indian acquiring pharmaceutical firms.

Table 7. T-test for difference of means.

Event Window	Mean CAR(%) of US and UK Markets	Mean CAR(%) of Other than US and UK Markets	Mean Difference	T-Value	Significance Value
$(-10 \dots 10)$	2.04	0.89	1.15	1.89	0.200
$(-5 \dots 5)$	2.90	0.11	2.79	3.11	0.000 ^b
$(-3 \dots 3)$	3.10	1.10	2.00	2.01	0.049 ^a
$(-2 \dots 2)$	3.41	1.11	2.20	2.31	0.040 ^a

Note: ^{a,b} represent significance at 5% and 1%, respectively.

It can be concluded from the analysis that the market reacts positively to announcements of CBA by Indian pharmaceutical firms. The notable finding of this study is that shareholder's wealth of Indian acquirers' pharmaceutical firms' increases more significantly in the short-term following the announcement of targets in the US and the UK. The maximum increment happens up to 7.1% in post-acquisition period.

5. Discussion

The rise of global players from developing countries and their investment strategies outside their national borders have been changing the global landscape. In view of the unprecedented CBA by Indian pharmaceutical firms since 2005 (Srivastava and Prakash 2014; Pathak and Nathani 2021), the present study examined the CBA by Indian pharmaceutical firms and their impact on shareholders' wealth. The results suggest that shareholders experienced short term wealth gains surrounding the CBA by Indian pharmaceutical firms though it was not statistically significant, although the returns to shareholders increased significantly in the short run when Indian pharmaceutical firms acquired their targets in the US and the UK. The authors were surprised to observe that Indian pharmaceutical firms have been actively engaging in CBA and only a limited number of studies analyzed the wealth impact of these acquisitions (Rani et al. 2011; Srivastava and Prakash 2014) and no previous study has attempted to analyze the short-term impact on shareholders' wealth when Indian pharmaceutical firms acquired targets in developed countries such as the US and the UK. The study by Wajid and Singh (2022) found positive impact on shareholder's wealth surrounding CBA by Indian pharmaceutical firms. On the other hand, the findings of Srivastava and Prakash (2014) stand in contrast and indicated negative returns to shareholders surrounding CBA by Indian pharmaceutical firms. In the international context, Hassan et al. (2007) reported that pharmaceutical industry acquisition activities involving the US transactions create short-term abnormal returns. The findings of the present study are consistent with the findings of Hassan et al. (2007) and Wajid and Singh (2022).

6. Conclusions and Recommendations

The present study analyzed the impact of CBA on the short-run abnormal returns to the shareholders of Indian acquiring pharmaceutical firms over the period 2005 to 2017. Only 100% acquisitions and transactions involving cash payments were considered for the study. Specifically, event study methodology along with two parametric tests was adopted to examine short-run abnormal returns surrounding announcement of acquisitions by Indian pharmaceutical firms. Although the value creation aspect of acquisitions is

inconclusive; some researchers suggest that these developments enhance shareholders value (Bhagat et al. 2010; Cakici et al. 1996; Hassan et al. 2007; Wang and Boateng 2007) while others express contrary suggestions (Aw and Chatterjee 2007; Aybar and Ficici 2009; Corhay and Tourani 2000; Saini and Singla 2015). Understanding value creation aspects of acquisition deals is important for researchers, policy makers, finance managers, and other practitioners. As stated by King et al. (2004), “the wide variance surrounding the association between M&A’s activity and subsequent performance suggest a subgroup of firms do experience significant positive returns from such activity”.

The study concludes that Indian pharmaceutical acquirers experience positive abnormal returns surrounding announcement of CBA. Further, the abnormal returns are higher and more significant for acquisitions in the US and the UK. This study contributes to growing literature by analyzing the CBA announcement returns to the shareholders of Indian acquiring pharmaceutical firms and concluding that Indian pharmaceutical firm’s shareholders achieve significant positive abnormal returns when the targets are based in the UK and US. The positive market reaction makes sense as pharmaceutical firms acquire patents, R&D capabilities, divisions, and other strategic resources, considered value-adding aspects by the acquirer firm’s shareholders (Hassan et al. 2007). The finding suggests that high-tech targets in developed markets create more value for shareholders; this is consistent with (Cakici et al. 1996), who examined 195 foreign acquisitions involving the US firms, and clinched that acquiring firms experience positive significant abnormal returns over (−10, 10) days surrounding the announcement of acquisitions of the US firms. The study by Kale (2009) expounds those overseas acquisitions by Indian firms created value for the Indian acquirer firm shareholders surrounding the announcement of the foreign acquisition; furthermore, the abnormal returns were higher when acquisitions in the developed markets were mostly in the US and the UK. Another study by Gubbi et al. (2010) analyzed 425 acquisition deals by Indian firms during 2000–2007 and established that international acquisitions created value for emerging market acquiring shareholders and that the market reacts positively when a target firm’s country has an advanced level of economy and institutions. Our findings support the view of Gubbi et al. (2010) that states that “when acquisitions are made in advanced markets, which are characterized by better quality of resources and institutions, the acquiring emerging-economy firm’s shareholders seem to benefit more”.

The results of the study are important for the shareholders and general investors. Based on the analysis of the results, shareholders may use this study to earn substantial returns if they act proactively surrounding CBA by Indian pharmaceutical firms. The results revealed that Indian pharmaceuticals experience positive abnormal returns surrounding announcement of foreign acquisitions, further, there is evidence of higher and significant abnormal returns when acquired firms are based in the US and the UK. Therefore, the investors can earn short term gains utilizing the information provided in this research.

The current study is also meaningful for managers and higher-level management of Indian pharmaceutical firms who are concerned with the acquisition announcement impact on the shareholder’s wealth. The study discovered that CBA can be an effective strategy to enhance shareholder’s wealth in the short run and in turn increase the value of the firms. Furthermore, the study pointed out the need to carefully select the target firm’s location, as the geographical location of target firms may have considerable impact on shareholder’s wealth.

The findings of the current study should be interpreted, firstly, on the criteria where deals financed only with cash and the acquisition must be 100% of the shares and secondly where only short-term value creation aspect of acquisitions needs to be analyzed. Future research may be undertaken to analyze the long-term impact of these strategies on the wealth of shareholders. Further studies can also examine the announcement returns to shareholders following regulatory hurdles, restructuring of R&D capabilities, and patent expirations in Indian pharmaceutical firms.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Cross-border acquisitions considered in the study.

Acquirers	Targets	Date	Country	Mode	Deal Size (\$ Million)
Aurobindo Pharma Ltd.	Mil Pharm Ltd.	10-02-06	UK	Cash	Undisclosed
Aurobindo Pharma Ltd.	TAD Italy IP	24-03-08	Italy	Cash	Undisclosed
Bilcare Ltd.	Pro Clinical Inc	15-07-05	USA	Cash	Undisclosed
Bilcare Ltd.	DHP Ltd.	19-09-06	UK	Cash	5
Bilcare Ltd.	Singular ID Pte Ltd.	04-01-08	Singapore	Cash	19.58
Cadila Healthcare Ltd.	Sentyln Therapeutics Inc.	20-01-17	US	Cash	171
Cipla Ltd.	Cipla Medpro South Africa Ltd.	21-11-12	S. Africa	Cash	512
Dishman Pharma & Chem Ltd.	Carbogenamics AG	22-08-06	Switzerland	Cash	75
Dishman Pharma & Chem Ltd.	Solvay Pharmaceuticals Fine	08-07-07	The Netherlands	Cash	Undisclosed
Dishman Pharma & Chem Ltd.	Synprotec Ltd.	20-04-05	UK	Cash	3.8
Lupin Ltd.	Hormosan Pharma Gmbh	30-07-08	Germany	Cash	Undisclosed
Lupin Ltd.	Nanomi B V	03-02-14	The Netherlands	Cash	Undisclosed
Marksans Pharma Ltd.	Hale Group	31-12-07	UK	Cash	Undisclosed
Marksans Pharma Ltd.	Time-Cap Labs Inc	30-06-15	US	Cash	28
Opto Circuits (India) Ltd.	Eurocor Gmbh	20-10-05	Germany	Cash	11
Opto Circuits (India) Ltd.	Criticare System Ind	25-02-08	USA	Cash	70
Piramal Health Care Ltd.	Avecia Pharmaceuticals	27-10-05	UK	Cash	16.9
Sun Pharmaceutical Ltd.	Chatten Chemicals Inc	27-11-08	USA	Cash	Undisclosed
Sun Pharmaceutical Ltd.	Ocular Technologies SARL	27-10-16	USA	Cash	40
Torrent Pharmaceuticals Ltd.	Heumann Pharma Gmbh & Co	27-06-05	Germany	Cash	Undisclosed
Wockhardt Ltd.	Wockhardt France (Holdings) S A S	10-11-16	France	Cash	Undisclosed
Unichem Laboratories Ltd.	Niche Generics Ltd.	15-12-06	UK	Cash	Undisclosed
Shilpa Medicare Ltd.	Loba Feinchemie	30-06-08	Austria	Cash	Undisclosed
Span Divergent Ltd.	Span Diagnostics South Africa Pty. Ltd.	01-12-14	S. Africa	Cash	Undisclosed

Source: CMIE PROWESS IQ.

Notes

- ¹ Indian Brand Equity Foundation Report (January 2017). Pharmaceutical Industry report. Published by Ministry of Commerce and Industry, Government of India. Report can be access from <https://www.ibef.org/archives/industry/indian-pharmaceuticals-industry-analysis-reports> (accessed on 10 February 2017).
- ² Department of Pharmaceutical Annual Report (Department of Pharmaceutical Annual Report 2017–2018). Published by Ministry of Chemicals and Fertilizers, Government of India. Report can be access from <http://pharmaceuticals.gov.in/document/annual-report-2017-2018> (accessed on 1 January 2018).
- ³ Indian Brand Equity Foundation Report (July 2019). Pharmaceutical Industry report. Published by Ministry of Commerce and Industry, Government of India. Report can be access from <https://www.ibef.org/archives/industry/indian-pharmaceuticals-industry-analysis-reports> (accessed on 21 August 2019).

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