

Informational Effect of PIPE Announcements: An Empirical Analysis of the Indian Infrastructure Sector

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Abstract

The last decade has witnessed a remarkable surge in PIPE transactions as companies resort to private equity due to the hardships associated with traditional stock offering. Private equity placements in different financial markets across the globe have evoked differing investor responses engendering both positive and negative announcement period returns. This paper aims to examine the impact of a PIPE announcement on investor behaviour and stock market performance in Indian context. To treat our research question and to test the hypotheses developed, we collected data on 44 listed companies, spanning the four major sectors of Indian Infrastructure firms- telecommunications, energy, transportation and utilities, and observed the price reactions surrounding 21 days of the announcement dates using market model-based event study methodology. The analysis shows that average Abnormal Return on the day of the announcement is 1.22% and Cumulative Average Abnormal Return is about -0.062% on the event day while, at the end of the event window it is 4.19%. The study reports significant impact of the announcement of privately placed issues on the stock price of the sample companies.

Keywords: PIPE, Infrastructure Sector, Event Study, Abnormal return

Introduction

With the swelling importance of capital markets as an external source of funding for various corporates, businesses and enterprises in the mid-1991, public offerings became an indispensable source of raising capital. Nevertheless, a private funding tool called private placement has proliferated during the past decades, dwarfing the volume and number of traditional seasoned equity offerings (SEO) in the USA (Chen et al., 2010), Canada, UK and Australia (Haggard et al., 2009). As defined by Section 42 of the Companies Act 2013, "Private placement means any offer of securities or invitation to subscribe securities to a select group of persons by the company other than public offering." Another term for these private offerings is Private

Investment in Public Equity or PIPE which can be best explained by the following break-down:

Private: A privately negotiated transaction between a company and the investor or a limited group of investors. The offer is not made public and transaction terms are individually negotiated.

Investment: Direct investment in a company. The investor buys newly issued equity and the proceeds directly benefit the company.

Public: The stocks of the issuing company are publicly listed on a stock exchange.

Equity: The PIPE investor invests in equity or an equity-linked security (e.g. convertible debt). This means the investor directly or indirectly acquires some degree of ownership in the company. (Sarve et al., 2011, p. 2)

The buyers in the private placement market are institutional and accredited investors like financial institutions, mutual funds, investment firms, hedge funds, companies and wealthy individuals who purchase these publicly traded stocks at a price below the current market value or at a discount. The issuers of PIPEs are exempted from registration compliances and the need to dispense a prospectus, as this cohort of investors is expected to be adept at investing. Private placements take the form of 1) traditional PIPEs- purchase of common and preferred stock with a fixed conversion ratio into common shares and 2) structured PIPEs- floating convertibles offering price protection as the number of common shares an investor is entitled to increases with a dip in stock price. Due to the unregistered nature of PIPE shares at the time of issuance, the investors face resale restrictions, making private placements an illiquid channel of investment. Since the investors have to hold on to their positions until the shares are registered, the issuing company offers a discount relative to the market price to manoeuvre them into buying such stock (Maynes & Pandes, 2010). According to Hertz and Smith (1993), US firms garnering funds via the private placement route tend to be small with 96% of common stock PIPE issuers having market capitalization below \$1 bn. The borrowers are relatively small firms with poor operating performance in the year prior to issuance of PIPE. These firms are usually financially-constrained with complex financings and little bargaining power. These relatively small, young, less known firms that either completely lack or have limited access to bank loans and public debt markets, exhibit a high degree of information asymmetry as also mentioned by Anjali Tuli (2016) in her study that private placement firms are associated with more information asymmetry when compared with non private route of issuance method. To circumvent the substantial issuance cost and disclosure requirements associated with an SEO, the firms prefer PIPE deals and offer a package of securities at an attractive discount, warrants and additional rights to attract PIPE investors (Lim, Schwert & Weisbach, 2019). Carpentier et al. (2013) claim that many of these are growth firms with unassured growth opportunities and generally provide poor rates of return following private placements of equity for both PIPE investors and common shareholders. These are the issuers who undertake intense investment activity. PIPE investors' return, although negative on average is higher than the return of existing shareholders because of the discounted price of PIPE shares.

Private Investment in Public Equity has seen a consistent rise in the number of deals in India since 2017. Figure 1 shows the number of PIPE deals that took place in India between 2005-2020 while Figure 2 depicts the deal values during the same time period. As evident from

the graphs, private placements are swiftly establishing themselves within Indian contours and gaining fame amongst Indian corporates as the companies employ this new and alternative method for ease of financing. The number of deals have been escalating since 2016 after a significant dip from 2014 till 2016 (Figure 1). A slight increase can be seen in 2020 with a total of 61 deals as compared to 59 deals in 2019. The total value of deals reached a whopping 5.1 billion dollars in 2019, more than doubling itself since 2015, but slumped to 3.1 bn dollars the next year (Figure 2).

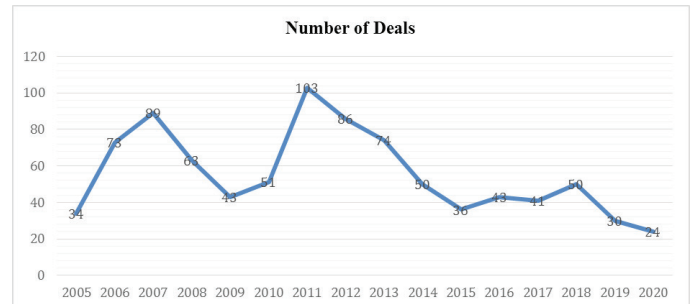


Figure 1: Number of PIPE deals across India from 2005-2020

Source: Computed by Authors from the data collected through venture intelligence.



Figure 2: Value of PIPE deals across India from 2005-2020 (in million US Dollars)

Source: Computed by Authors from the data collected through venture intelligence.

The uptick in PIPE announcements by publicly listed companies can be attributed to various potential motivators. Bernhard et al. (2017) highlights enhanced liquidity and faster process of deal execution as possible drivers for PE investment in PIPEs. Limited disclosure and documentation needs, reduced regulatory hurdles, easy access to market, protection of strategic information and the less onerous, time and cost-efficient nature of PIPEs are the reasons investors are lured into purchasing privately offered shares. Additionally, in contrast to the PE investors, PIPE investors invest at a significant discount to the current market price.

Notwithstanding the mounting importance of private placements as a source of external funding, the existing literature in context of Indian capital market is meagre and needs elaboration. This paper is an attempt to probe into the Indian private placement market and study the response PIPE announcements generate in the Indian Infrastructure sector. Telecommunications, Energy, Transportation and Utility companies represent the focus of this study. Since, there is a limited research with reference to the Indian Infrastructure sector, this study tries to address this gap.

Review of Literature

The literature on stock market returns suggests a number of theories that play a cardinal role in the analysis of financial markets. Numerous empirical studies undertaken earlier have developed different mechanisms that influence prices of stocks. As per the price pressure hypothesis, when the stock market demand curve is not perfectly elastic, equity flows in the market create a transient deviation from the equilibrium price as the stock price moves up (down) due to buying (selling) pressure, resulting in positive (negative) returns. Eventually as this pressure dissipates, prices are aligned with the equilibrium, thereby causing negative (positive returns). The amount of equity invested in a project or firm is a signal of its quality. Miller & Rock (1985) propose that managers have superior information about level of firms' future profits, and they (managers) use dividend announcements to transmit this information about firms' current/future cash flows to the market. The authors suggested that firms whose shares have a bigger reaction to the information brought into the market should be the ones that have stronger information asymmetry. According to Leland and Pyle (1977), a manager owning shares of a company is unintentionally signalling that the firm has a high value. Issuance of substantially high levels of debt communicates firm's expectations of high cash flows to the market (Ross, 1977), which would ultimately wend its way into the market price of the firm's shares. Past researchers have formulated myriad mechanisms that affect share prices. The scope of this paper is limited to the informational effect of private placements. The paper focuses on the share price impact of the informational element present in the announcement of a private placement.

Various studies surveying the market reactions to private placements have indicated the existence of information in such announcements. The private placement of equity shares conveys information about the firm to the market participants. This information moulds investor behaviour and thinking, which is manifested in the firm's stock price reaction. This is referred to as information content

hypothesis or signaling effect. According to Wruck's (1989) monitoring hypothesis, when private placements are bought by an informed and engaged investor who is prepared and qualified to watch management, he purchases a significant stake and gains access to the firm's board. Due to close monitoring, resources are used efficiently, agency costs are reduced, firm's value increases and market reacts with positive stock prices. Similarly, certification hypothesis proposes that when a well-informed investor agrees to commit funds, it sends a positive signal to the market as the investment by the informed investor serves as a certification of firm value (Hertzel & Smith, 1993). This is also supported by later studies (Krishnamurthy et al., 2005; Dai, 2007) that highlight how the private purchase of a large block of the firm's stock by affiliated and informed investors serves as an approval of the firm's market valuation. However, stock returns associated with active investors are higher than those associated with "passive" investors. As evidenced by Barclay et al. (2007), 80% of the private placement offerings between 1979 and 1997 were made to "passive" investors who have minimal involvement in the issuer's affairs post-placement. Such "passive" purchasers help catalyse the consolidation of management entrenchment and the discounts act as compensation offered by the issuer for the same, thereby evoking negative market response upon the disclosure of entrenchment and passivity. This serves as a strong counter-argument to the monitoring and certification effect of private placements.

The various studies on PIPE transactions can be summarized into two categories: First, the studies with positive announcement effect and Second, studies documenting negative abnormal returns surrounding private placements. Some noteworthy studies find significant and positive abnormal stock returns on the announcements of private offer of shares (Alli & Thompson, 1993; Barbarosh, 2019; Chen et al., 2010; Hertzel & Smith, 1993; Wruck, 1989; Wruck and Wu, 2009). Conversely, some prominent studies (Lin & Gannon, 2007; Nor, 2007; Tuli & Shukla, 2015) show negative abnormal stock returns following PIPE issuance. Alli and Thompson (1993) study private placements of unregistered equities of both OTC and exchange listed firms (difference in market reactions of registered and unregistered private common stock placements due to difference in degrees of associated information asymmetry) and find significant positive stock price effects in the short-run, espousing the quality certification hypothesis proposed by Wruck. Although, the long run abnormal returns during 24 months around the private placement are significantly negative. Wruck and Wu (2009) highlight the announcement of new governance relationships with buyers of PIPE issues as

the investors are appointed as managers, directors or new business partners and such placements experience significant positive announcement period returns. PIPE announcements increase stock prices in anticipation of increased ownership concentration leading to improved monitoring that resolves uncertainty about firm's investment decisions and ability to raise capital (Wruck, 1989) and indicates confidence in the firm (Hertzel & Smith, 1993). Hertzel et al. (2002) find that issues of private equity succeed relatively poor performance of the issuer and the investor over optimism about the prospective improvement in the operating performance in the future is the cause of a positive announcement reaction but a negative post announcement stock price performance of privately placed equity stocks. They conclude that firms are overvalued at the time of private issues of equity. Similarly, Chen (2016) finds that issuing firms experience positive abnormal returns during the announcement period. A study of the German companies by Achleitner et al. (2008) reports a 5.90% increase in target shareholders' wealth around the event day.

Although these researches demonstrate a favourable announcement effect, other studies demonstrate a different stock price response. The information impact of the QIP announcement on the Indian capital market was examined by Tuli and Shukla in 2015. The findings suggested that the private placement announcement had a negative impact on stock price. Lin and Gannon (2007) explored stock price reaction to private placements in Australian biotechnology sector using event study methodology over 66 days period surrounding announcement and have documented negative CAR following large private issue in the short term contrasted with positive CAR for the small private placement issue. The short-term negative effect favors the price pressure hypothesis. Nor (2007) investigated the effect of 46 private placement announcements in the Malaysian market between the period 1994 to 2003 by employing the event study methodology. The findings suggested positive wealth effects as explained by positive CARs prior to the announcement day. However, the average abnormal return (AAR) was negative on the event day. On the other hand, studies also show a positive effect prior to announcement which disappears after announcement of private placement. Zheng (2017) measured the price behavior of private placements by companies across different industries in China and exhibited positive stock price effect. The positive price effects were concentrated before the announcement period and gradually disappeared with passing days after the announcement.

There are also studies that show **no significant effect** on the stock prices by private placement announcement.

Irshaid and Ghusain (2014) undertook a study to judge the efficiency of Amman Stock exchange in Jordan by examining the directional impact of private placements of the Amman Stock exchange on the stock prices by using event study methodology. The abnormal returns showed no reaction to private placements. The positive abnormal return after the event held no statistical significance leading to the conclusion the Amman stock exchange is inefficient at the semi strong level. Few studies also study the impact of private placement on rival firms. Kung Chi Chen, Cheng, Huang & Zhao (2019) examined the market reactions to private equity placements and the consequent contagion and competitive effects on rivals in the Taiwan Stock Exchange. The findings of the market model indicate that issuers enjoy greater positive market reactions when proceeds of offering are mainly channeled towards establishing a long-term strategic alliance or integrating business and the lead investor is in the same industry. Competitive forces dominate the contagion forces when PIPEs are issued to establish a long-term strategic alliance or to integrate business or the lead investor is from a different industry. Rivals derive greater benefit from contagion effect when the announced purpose of share offerings is to raise capital and rivals have relatively lesser market power than the issuer.

Research demonstrates both positive and negative announcement effect of privately placed equity in different markets of various countries. Some studies also show no significant effect of announcement on abnormal return of companies. Hence, the dissimilar results concluded by prior studies render it vital to conduct a research which aims at studying the influence of private issues of shares by public companies on shareholders' wealth, in the Indian scenario, i.e. the announcement effect of private placements on the Indian Capital Market.

Research Objective

To examine the influence of PIPE announcement on stock market performance in relation to the Indian Infrastructure sector.

Data Sources and Sample Description

The sample comprises of 44 private placement of equity shares issued by infrastructure companies in India between 2004 to 2019. The four main sub sectors of infrastructure firms have been focused in this study namely- Telecommunications, Energy, Transportation and Utilities. The data for the study has been extracted from VCCEdge. VCCEdge is a research platform and deal database which provides statistics on private equity and venture capital in India. The study comprises of

three datasets. The first set consists of announcement of Private Equity Investment in Public Equity made by sample companies. As per the data by VCCEdge, the announcement data of 44 listed companies, spanning the four major sectors of Indian Infrastructure firms-telecommunications, energy, transportation and utilities is collected. The second data set comprises of daily closing prices of the stock from NSE in order to show the effect of private placement announcement on short-run abnormal returns. The NSE NIFTY index's daily closing prices make up the third piece of data. In order to assess abnormal returns for each company within the sample period, it serves as a benchmark.

Research Methodology

Using a market model-based event study methodology, the study aims to investigate how the announcement of a private investment in public equity affects stock market performance. Event study finds abnormal return to examine the market reaction. The market model method is used to calculate expected rate of return on each security. By regressing daily stock return on the market index over the estimation period, the model's parameters were evaluated.

The primary purpose of event research technique is to investigate market efficiency in terms of information efficiency in order to determine how an announcement of a private investment in public equity will affect the price of the security and, ultimately, the shareholder's wealth. The event window for the study spans 21 days (-10, +10) that is the number of trading days before and after day zero, where day zero is the event day, the day of announcement of Private Investment in Public Equity.

The research applies a two-step approach to test the response of PIPE announcements on stock return. The first step is the estimation of daily stock returns, model parameters and expected return on each stock under study.

In this paper, expected returns have been assessed for each announcement using market model as given below:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + e_{it}$$

where,

$E(R_{it})$ = is the expected return on firm i on day t;

α_i = is the alpha coefficient of ith security

β_i = is the beta coefficient of ith security

R_{mt} = is the Expected return on index

e_{it} = Error term with a mean zero and a standard deviation which is a constant during time period 't'.

Excel has been deployed to subject our data to the event study methodology. Estimated returns are computed

during the estimation window beginning 120 days before the event window (i.e. a time period of 120 days ending just before Day -1 of event window) to be used for calculating alpha and beta coefficient for each security.

The Abnormal Return, which is determined for each security, is the difference between the Actual Rate of Return and the Expected Rate of Return. In the second step Abnormal Returns are averaged across securities to calculate average abnormal return (AARs) for each day during the event window for analysing ARs around the event day.

$$AR_{it} = Rit - E(R_{it})$$

where,

Rit = Actual Return.

$E(R_{it})$ = Expected Return.

ARs for the event window is not just influenced by the announcement of an economic event which the researcher is interested in but also several other factors and events have an influence on AR. Therefore, to neutralize the influence of other events other than the announcement event under study, AR of all individual securities across the event window are averaged at one point of time as shown below:

$$AAR_t = 1/N \sum AR_{it}$$

AARs show how a private placement announcement affect shareholders' value on a specific day during the event window. To determine Cumulative Average Abnormal Returns, AARs are further accumulated over time (CAARs). It provides information on the trend of the typical security price over time. Utilizing the following formula, cumulative average abnormal return can be computed:

$$CAAR_t = \sum AAR_{it}$$

The informational value of a PIPE announcement is studied using the AARs, and the price adjustment to new information is examined using the CAARs.

The effectiveness of the market has been evaluated using the student's t-test.

To determine whether the abnormal return and cumulative abnormal returns were statistically different from zero, the following hypothesis was put forth:

H_0 : Average Abnormal Returns = 0.

H_1 : Average Abnormal Returns \neq 0.

Research Findings and Results

Table 1 shows the abnormal return for each of the 44 companies for specific days pre and post the event day. From the table it can be denoted that on the event day (i.e. 0th day) out of 44 companies, 22 companies showed

a positive abnormal return with a maximum return of 19.2692% on GP Petroleum’s shares. 27 companies showed positive returns on the first day after the announcement, 14 companies showed positive abnormal returns on the fifth day following the announcement, and 21 companies shown positive abnormal returns

on the tenth day following the announcement. On the other hand, in the pre-announcement period, on the 1st day prior to the announcement 21 companies showed a positive return. On the 5th day also 21 companies showed a positive abnormal return but only 15 companies showed a positive abnormal return on the 10th day before the event day.

Table 1: Abnormal Return for Specific Days Before and After Event Day.

S.No.	Company	-10 day	-5 day	-1 day	0 th day	+1 day	+5 day	+10 day
1	Vodafone	-1.777	-0.304	-2.514	-0.241	2.2706	-1.566	-3.419
2	AGC 2013	-0.42	2.7877	-1.092	1.4537	2.9717	1.1557	-1.231
3	AGC 2015	7.4731	-1.673	-0.602	0.9031	-2.891	-0.676	-2.691
4	AGC 2016	-0.224	0.4765	-0.637	-0.06	-0.11	-0.927	-2.221
5	AGC 2019	-1.387	0.9811	1.0595	-2.218	2.7299	-9.884	1.3668
6	Bharti Airtel	-0.199	0.1149	-1.799	1.0939	0.3788	-0.999	-0.785
7	Dhanus	0.0582	-3.988	-1.255	-2.791	-4.146	-2.926	1.678
8	Aban	-0.206	-2.366	5.7221	13.4911	-0.481	-1.53	0.062
9	Aegis 2010	-2.116	0.1165	-0.233	-0.584	-1.54	-0.582	0.7681
10	Aegis 2017	-0.784	-1.391	2.1904	-1.843	0.0000287	-0.733	-0.018
11	Gol Offshore	-0.32	-1.108	-1.716	-0.067	0.3897	-0.189	1.2761
12	Gp Petroleums	-1.337	1.06	-7.775	19.2692	19.1594	18.7399	1.1434
13	Gujarat State	0.4557	2.2622	-2.819	1.3525	1.9652	0.0362	1.0432
14	Petronet Lng	-1.803	-0.358	1.1542	1.7199	0.8719	1.4034	1.3772
15	Svgl 2007	1.7439	0.4596	-0.438	4.1319	-1.279	-2.023	4.8676
16	Svgl 2010	-0.023	-0.385	0.1208	1.6727	1.6015	-1.086	-1.672
17	Svgl 2016	4.8433	-4.276	3.87	-1.029	-3.619	-3.641	-1.22
18	Svgl 2011	0.849	-0.214	4.4836	0.4201	1.2144	0.457	2.1421
19	Allcargo Logistics Ltd.	-0.455	0.1645	-0.474	-1.654	-0.819	-1.705	2.5697
20	Mercator Ltd.	-2.491	-0.017	5.2079	-1.489	0.6138	-0.523	1.1221
21	Adani Ports and Special Economi	1.5705	-1.866	-2.219	1.3356	-0.49	0.8139	0.0155
22	Gateway Distriparks Ltd.	1.5893	0.723	1.6879	2.9671	0.765	-0.744	-1.515
23	Adani Ports and Special 1 2009	-0.027	1.067	-3.115	-0.44	-0.259	1.5821	-2.223
24	Mercator Ltd.	2.2573	-4.62	2.6389	5.069	-7.062	-2.206	-0.253
25	Allcargo Logistics Ltd. 2008	-0.666	1.0443	1.5788	9.3459	6.4762	-1.423	0.2106
26	Sical Logistics Ltd.	-0.649	-2.777	8.7665	4.5499	2.7246	-2.152	-1.452

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27	Gateway Distriparks Ltd.2006	-1.86	-3.786	0.6665	-1.172	2.2293	-3.388	-0.853
28	Global Offshore Services Ltd.2007	-0.881	2.6619	0.4973	0.3198	2.695	-0.331	-3.653
29	Varun Shipping Company Ltd.	1.7264	-0.223	-1.103	-6.871	1.1028	2.9198	-0.459
30	Great Eastern Shipping Co. Ltd. 2011	-4.022	-1.282	2.0013	3.6215	5.7776	-0.399	-0.951
31	Great Eastern Shipping Co. Ltd. 2011	-1.741	1.8012	0.9443	0.123	1.6455	-0.986	3.2401
32	Varun Shipping Company Ltd. 2007	-1.028	-1.103	8.9593	-1.887	-1.96	4.6094	1.2491
33	Mercator Ltd 2017	0.1398	-1.408	-0.201	-0.718	0.859	2.412	-1.268
34	Everest Kanto Cylinder Ltd. 2011	-3.715	1.3233	-3.195	-0.445	6.3808	0.4774	4.9099
35	Everest Kanto Cylinder Ltd 2011	-2.069	-1.058	1.2986	0.0212	1.5477	0.524	1.1502
36	Everest Kanto Cylinder Ltd 2008	-0.96	0.1272	2.3177	3.4926	-0.966	-3.67	0.9649
37	Everest Kanto Cylinder Ltd 2008	-0.437	-1.613	2.1948	-4.222	0.2681	-6.126	-2.534
38	Orient Green Power Co. Ltd.	5.6439	-4.91	1.9632	-2.012	-0.21	-1.962	1.6368
39	Everest Kanto Cylinder Ltd 2007	-2.334	4.7482	-0.135	1.2372	-7.947	-4.018	0.2046
40	Ntpc Ltd.	-1.198	1.8096	-3.573	-1.081	1.4061	0.1125	-0.181
41	Everest Kanto Cylinder Ltd 2009	0.4458	-1.345	-1.935	1.6991	0.9945	2.5042	-0.43
42	Everest Kanto Cylinder Ltd 2009	-5.315	-2.909	-5.346	-1.249	1.5992	-2.317	4.4526
43	Everest Kanto Cylinder Ltd 2011	0.0231	-2.759	-2.08	3.9004	1.2903	-3.017	-0.196
44	Everest Kanto Cylinder Ltd 2010	2.3496	-0.826	4.7243	2.5699	1.6663	-0.628	-3.336

Source: Computed by authors.

Table 2 shows AARs and CAARs from 10 days before the event day to 10 days after the event day. The table shows that, with the exception of two days, -7 and -1, AARs are negative on every day leading up to the event. It turns positive on the day of the announcement (day 0) and stays that way through day 2. After turning negative on days 3 and 5, it stays positive for the remainder of the event days, from 6 to 10. The CAARs are negative (-0.0623752%) from day -10 to the day of announcement during the 21-day event window, but they turn positive from day 1 onward. The cumulative average abnormal return at the end of the event window is 4.192964% which is not close to zero, indicating inefficiencies of the stock market, which in turn proves that PIPE announcement has an impact on the stock market performance of the Indian Infrastructure sector. Figure 3 gives the graphical representation of the AAR and CAAR for the event window.

Table 2: Deviation in Abnormal Returns

Abnormal Return	0 th day	+1 st day	+5 th day	+10 th day
<-5%	0	2	2	0
-5% to -2%	4	10	10	7
-2% to 0%	16	10	19	15
Total	20	22	31	22
0% to 2%	13	18	9	15
2.01% to 5%	7	6	3	5
5.01% to 20%	4	4	1	0
>20%	0	0	0	0
Total	24	28	13	20

Note: The table depicts most of the positive abnormal return in the range 0% to 2%.

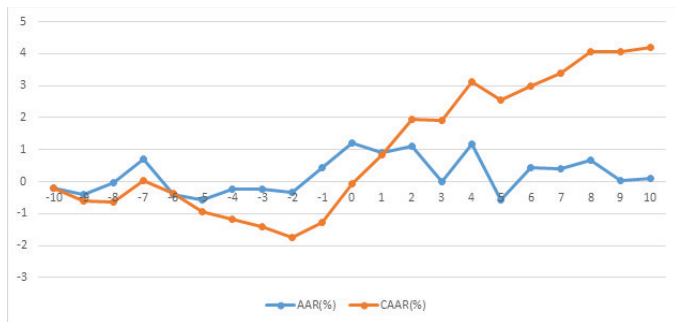


Figure 3: Graphical Representation of AAR and CAAR over 21 day event window

Source: Computed by authors from the data obtained from VCC Edge.

Test Statistics Test Results

Here we discuss the result of the tests for a sample of 44 PIPE deals of the Infrastructure sector for the three different event windows. The standardized t test has been used in this study. T-statistics of CAAR is calculated by dividing the Cumulative average abnormal return by its estimation period standard deviation using the formula mentioned below:

$$T\text{-statistics of CAAR} = \text{CAAR} / (\text{Standard Deviation} \times (\text{No. of days in window})^{(1/2)})$$

where standard deviation is calculated by taking Average Abnormal Return over the estimation period of 120 days.

Table 3: AAR and CAAR over 21-day Event Window

Event day	AAR(%)	CAAR(%)
-10	-0.2107819	-0.2107819
-9	-0.3899748	-0.6007568
-8	-0.0455359	-0.6462927
-7	0.69191445	0.04562177
-6	-0.4142016	-0.3685798
-5	-0.5644618	-0.9330416
-4	-0.2468625	-1.1799041
-3	-0.2185228	-1.398427
-2	-0.3338927	-1.7323197
-1	0.44978549	-1.2825342
0	1.22015901	-0.0623752
1	0.90490491	0.84252975
2	1.10058585	1.9431156
3	-0.013248	1.92986762
4	1.18581334	3.11568096
5	-0.5592939	2.55638709
6	0.42862194	2.98500903
7	0.4122176	3.39722663
8	0.66542059	4.06264722
9	0.01921144	4.08185865
10	0.11110535	4.192964

Source: Computed by authors from the data obtained from VCC Edge.

Table 4 shows the cumulative average abnormal returns for three different event windows of lengths of 21 days, 11 days, and 3 days. The 21-day CAAR corresponds to the 10 days prior to and 10 days following the announcement. The CAAR of 11 days denotes the period from 5 days prior to 5 days following the announcement day, and the CAAR of 3 days denotes the period from 1 day prior to 1 day following the announcement day. The results of CAAR test statistics for each event window are discussed below:

(1) Results of tests for the 21-day event

In table 4, results of T-statistics of CAAR show statistically significant CAAR of 1.982544 during the 21-day event period. The excess of T-statistic over the t- table value of 1.96 implies that announcement has an impact on the stock market performance of the Indian Infrastructure sector.

(2) Results of test for 11-day event period

As shown in table 4, t value for CAAR is statistically insignificant during the 11-day event period (calculated t value 1.910891 is less than the t- table value of 1.96).

(3) Results of test for 3-day event period

The result of T-statistics of CAAR show statistically significant CAAR during 3-day event period, that is, 3.221088, which is less than the t- table value of 1.96.

Based on the test results, it can be ascertained that T-statistics of CAAR for 21-day event period and 3-day event period show statistically significant CAAR. Hence, we disprove the null hypothesis that CAAR is zero for the whole event window. As this reveals the inefficiencies of the stock market to earn abnormal return, we conclude that the market is inefficient while analysing the impact of PIPE announcement on the stock market performance of the Indian Infrastructure sector.

Table 4: Cumulative Average Abnormal Returns Over Different Event Windows

Event Window	CAAR	CAAR Test Statistics
(-10,+10)	0.04193	1.982544 (Significant)
(-5,+5)	0.02925	1.910891(Insignificant)
(-1,+1)	0.025748	3.221088 (Significant)

Source: Computed by Authors.

Conclusion

The study analysed the impact of PIPE announcements on the dataset of 44 companies covering the four major sectors of Indian Infrastructure firms- telecommunications, energy, transportation and utilities. The authors used event study methodology to gauge investor response to PIPE announcements and construct their short-term impact on stock prices.

The study illustrated that on the event day (i.e. 0th day), out of 44 companies, 22 companies experienced a positive abnormal return with a maximum return of 19.2692% by GP Petroleums. Similarly, majority of AARs are positive for the days after the event day (announcement day). Since the security reaction to PIPE announcement cannot be captured for one specific day using average abnormal return, it is needed to accumulate the abnormal returns. Hence cumulative average abnormal return was computed for the event window. CAAR value on the event day is -0.0623752% which goes on increasing during the post announcement period and at the end of the event window, turns out to be 4.192964%, which is not close to zero, signalling stock market inefficiency. This establishes that PIPE announcements have an impact on the stock market performance of the Indian Infrastructure sector.

These findings are in line with the results of numerous studies that have previously explored market reactions to private placements and have validated the existence of information in such announcements. The fact that the announcement of private investment in public equity has a significant impact on the share price implies that information is not quickly exhibited in the share price. The private placement of equity shares conveys information about the firm to the market participants. This information in turn moulds investor behaviour and thinking, which is manifested in the firm’s stock price reaction and thus, it can be concluded from this study that the market of infrastructure sector is progressing towards being informationally inefficient.

Limitations of the study and scope for future research

This study focused on a small sample of 44 companies of the infrastructure sector of the Indian economy. The results could be different if more companies are involved. The event window for the study spans 21 days (-10, +10). The same can be stretched to see the long-term impact on security price. The study can also be done on other sectors of the Indian economy to find the impact of private investment in public equity. There are various other sectors which are still unexplored in the current literature. An analysis on identifying the factors explaining the announcement return will help in better understanding the market.

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