Private Placements to Owner-Managers: Theory and Evidence

Abstract

We present an asymmetric information model to examine private placements of equity. Our main conclusion is that allowing private placements to owner-managers can mitigate, if not eliminate, the underinvestment problem. Our model predicts that announcement period returns for private placements should be: (1) positive; (2) dependent on regulatory constraints that determine the issue price; (3) positively related to volatility; (4) negatively related to insider ownership; (5) negatively related to illiquidity; and (6) inversely related to proxies of manipulation. Our model also predicts that: (7) announcements effects for private placements to private equity investors should be lower than that those of private placements to owner-managers. We empirically test our model's predictions, along with others from the literature, on a sample of private placements issued in the Indian capital markets during 2001-2009 and report empirical evidence largely consistent with the model.

Private Placements to Owner-Managers: Theory and Evidence

1 Introduction

Significant amounts of capital are raised through private placements of equity around the world.[1] Private placements typically occur in the form of block deals issued to firm managers, private equity players, or banks and other financial institutions. The generally positive market reaction to announcements of private placement issues of equity (in contrast to the generally negative reaction to public issues made through conventional secondary equity offerings) suggests that the market infers a positive signal about firm value when a private placement is announced.

In this paper, we examine the issue of private placements to owner-managers from a theoretical as well as an empirical perspective. Our main conclusion from the theoretical analysis is that, as long as the manager is not constrained by capital or by risk aversion, allowing insiders to subscribe not only to rights offerings but also to private placements solves the underinvestment problem. In Our paper contrasts to with Myers and Majluf (1984) and related papers, which rule out the possibility that of managers can subscribeing to their firm's equity issues. This assumption is reasonable in markets where (lack of) managerial wealth and managerial risk aversion constrain managers from participating in equity issues (an exception being management buy-outs). However, in many economies, family-controlled business groups dominate the economic landscape. In such economies, promoters of firms often continue to operate them as owner-managers. These promoters usually have access to other resources, for example through other firms they control, which allows them to participate in subsequent equity offerings. Our model, therefore, extends our understanding of the financing decisions made by managers in many countries, particularly in the emerging economies. However, the model is not restricted to these markets since the implications of the model are generally applicable to any market where owner-managers have the choice of issuing equity to themselves, in the presence of regulatory constraints. By including a third alternative of issuing equity to owner-managers in the form of rights offerings and private placements, in addition to the conventional choice between using internal resources and seeking outside financing, we generalize the Myers and Majluf (1984) model.

The central feature of our model is the information asymmetry between outsiders and insiders regarding the hidden value in the a firm. We show that the investment-financing decision of in-

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[1]See Fenn et al. (1997) and Wu (2004), for example.

siders depends on the strength of the private signal insiders observe about the hidden value. For In the case of weak signals of the hidden value, insiders issue equity to outsiders. For When there are intermediate signals about the firm's [note change to straight quote] hidden value, insiders opt for a rights offering alternative or the private equity alternative, depending on the severity of their capital constraints. For In the presence of sufficiently good signals about the hidden value,; however, insiders opt for a preferential allotment of equity to themselves, but if they are severely capital constrained, they would ratherwill prefer to underinvest. These results can be seen as a generalization of the Myers and Majluf model to the situations where insiders are allowed to finance the firm. The key implication arising out of this model is that, if owner-managers do not face severe capital constraints, private placements to owner-managers can mitigate, if not eliminate, the underinvestment problem.

While the "no underinvestment" outcome is clearly beneficial from a social welfare perspective, allowing insiders to participate in equity issues is fraught with the danger of managerial self-dealing. Insiders have incentives to manipulate share prices to lower levels prior to issuing shares to themselves. Therefore, Financial financial markets that permit insider equity financing often impose regulations on the issue price to counter these incentives. Thus, any empirical examination of our model will necessarily be influenced by regulatory constraints imposed on private placements to insiders. Therefore, in this study, we validate the above claims by examining a sample of private placements in India. Equity issues in India are regulated by the Indian securities market regulator, the Securities and Exchange Board of India (SEBI). The key feature of SEBI's regulation relevant for to our model is that the issue price in a private placement cannot be lower than the maximum of the most recent market price and the average market price in the previous six months. This regulation is clearly aimed at discouraging managers from "timing" the market and also from "manipulating" stock prices in order to issue shares to themselves at lower prices lower in relation tothan their true market value (managerial self-dealing). Hence, our model explicitly incorporates this regulatory pricing rule, as well as the possibility of price manipulation by insiders, in developing clear and testable implications.

Our work is related to Hertzel and Smith's *Certification Hypothesis* in that it also too deals with information asymmetry, but it endogenously accounts for managerial self-dealing and the associated market inference regarding the information asymmetry. In general, the hypotheses that emanate from our model can be classified as part of the broad *Undervaluation Hypothesis*, as conjectured in Barclay et al. (2007), page 478: "This situation, in many ways, is the reverse

of Myers and Majluf (1984). In that analysis, management acting in the interests of all current shareholders issues equity to outsiders when management believes the stock to be over-valued. In this explanation, managers issue stock to themselves when they believe their stock to be undervalued.' [note change to straight quotes as the curely ones dont show up in pdf]

Our model predicts that announcement period returns for private placements should be: (1) positive; (2) dependent on regulatory constraints that determine the issue price; (3) positively related to the volatility of prices; (4) negatively related to the illiquidity of the stock;, (5) unrelated to the insider ownership; and (6) negatively related to proxies of manipulation. Our model also predicts that (7) announcements effects for private placements to private equity investors should be lower than that those of private placements to insiders. We empirically test the model's predictions on a sample of 164 private placements issued in the Indian capital markets during 2001-2009 and report empirical evidence largely consistent with the model. In addition to the empirical predictions of our model, we also find that: (8) firms affiliated to business groups experience lower but statistically insignificant announcement period returns compared to stand-alone firms; and (9) private placements made to (active) private equity investors do not experience higher announcement period returns than those made to banks or financial institutions.

The extant literature on private placements suggests several possible motivations for private placements. Firstly, Wruck (1989) suggests that private placements are used to attract active shareholders who provide monitoring benefits (*Monitoring Hypothesis*). More recently (Wu (2004), and Barclay et al. (2007)), find that private placements are used to bring in passive shareholders (*Managerial Entrenchment Hypothesis*). Lastly, (Wu (2004), Baek et al. (2006) and Barclay et al. (2007)) show that private placements to owner-managers are made at significant discounts (*Managerial Self-Dealing Hypothesis*), which is a variation of the *Managerial Entrenchment Hypothesis*[removed emphasis as this is the second time of mention I think you are only using emphasis when introducing the names of the hypotheses]. The most recent empirical evidence in the U.S. supports the Managerial Entrenchment and the Managerial Self-dealing Dealing Hypotheses.

The empirical evidence presented in this study is largely supportive of the Undervaluation Hypothesis of our model. All our key findings are robust in the sense that they persist after controlling for manipulation. Our analysis also sheds light on the Monitoring Hypothesis, Certification Hypothesis and Entrenchment Hypothesis Hypotheses that have been proposed in the existing literature on private placements. Our results show little support for the latter threeMon-

itoring Hypothesis, the Certification Hypothesis or the Entrenchment Hypothesis in the context of Indian capital markets.

In summary, the contribution of our paper is to extend the Myers and Majluf (1984) framework to examine the financing decisions of firms, in particular that to issue of private placements to owner-managers, under information asymmetry. Apart from developing the model, we are able to test its predictions with data from the Indian securities market, where owner-managers dominate the capital market and the regulatory environment is different from that existing in the U.S. or and Europe, the focus of many of the prior studies. Overall, our empirical evidence corroborates the Myers and Majluf framework after accounting for the competing motivations of private placements.

The paper is organized into five sections. A brief background on the regulation of private placements in India is presented in Section 2. Section 3 presents our theoretical model and the corresponding empirical implications and testable hypotheses that follow from the model. (The proofs are presented in Appendix 1.) Section 4 describes the data and certain methodological issues, and also presents the results of the empirical analysis. Section 5 concludes.

2 Private Placements and Regulatory Restrictions in the Indian Securities Market

Before developing a model to generate testable empirical implications related to the Undervaluation Hypothesis, we first discuss the regulatory environment affecting the private placement market in India. This description is provides essential background for that helps to presenting the salient features of our theoretical model. The Indian capital market is regulated by SEBI. In India, private placements of listed companies - often referred to as *preferential issues* or *preferential allotments* - are quite popular. (Henceforth, we will use the terms preferential allotment and private placement interchangeably.). In 2008-2009, Indian firms raised the equivalent of US$7.97 billion through preferential issues, compared to US$6.21 billion, US$ 0.75 billion, and US$ 0.04 billion, through rights offerings, outside equity issues (initial public offerings (IPOs) and secondary equity offerings (SEOs)), and qualified institutional placements (QIPs), respectively.[2] It should be emphasized that not all preferential allotments are made to owner-managers

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[2]Source: NSE Fact Book 2008-2009. The figures are converted from Indian Rupees (INR) to US dollars (USD) at the exchange rate 1 USD = 45 INR, which prevailed at that time. The popularity of preferential allotments seems to have increased in recent times after the recentsince the introduction of a grading system for IPOs in India

(or promoters, as they are known in local parlance).[3] Preferential allotments are also made to private equity players, banks and financial institutions. However, all preferential allotments are subject to SEBI's pricing regulations, which are described below.

2.1 Pricing of Preferential Issues:[using subsection command would automate the numbering]

The pricing of preferential equity issues in India is governed by the following regulations, with the relevant phrases italicized:[4] "The issue of shares on a preferential basis (equity shares/ fully convertible debentures/ partly convertible debentures) can be made at a price *not less than* the *higher* of the following: (a) The average of the weekly high and low of the closing prices of the related shares quoted on the stock exchange during the *six month* period preceding the relevant date; or (b) The average of the weekly high and low of the closing price of the related shares quoted on a stock exchange during the *two week* period preceding the relevant date." The relevant date for this purpose is the date 30 days prior to the date on which the meeting of the general body of shareholders is held.

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provided by major rating agencies or their affiliates. This somewhat unusual system of IPO grading was introduced to provide a mechanism for assessing issuer quality and thereby restricting the entry of fly-by-night operators into the market. Deb and Marisetty (2009[2010 in references]) find that the grading of IPOs has information content only for retail investors; institutional investors do not appear to make their IPO investment decisions on this basis. Hence, it is likely that issuers who target institutional investors are better off going for preferential issues, as they eliminate the costs associated with grading and related expenses incurred in public offerings.

[3]Shareholders do not enjoy pre-emptive rights in India.

[4]SEBI Disclosure and Investor Protection Guidelines, 2000, updated 2009.

Figure 1: SEBI regulations on the issue price in a preferential allotment
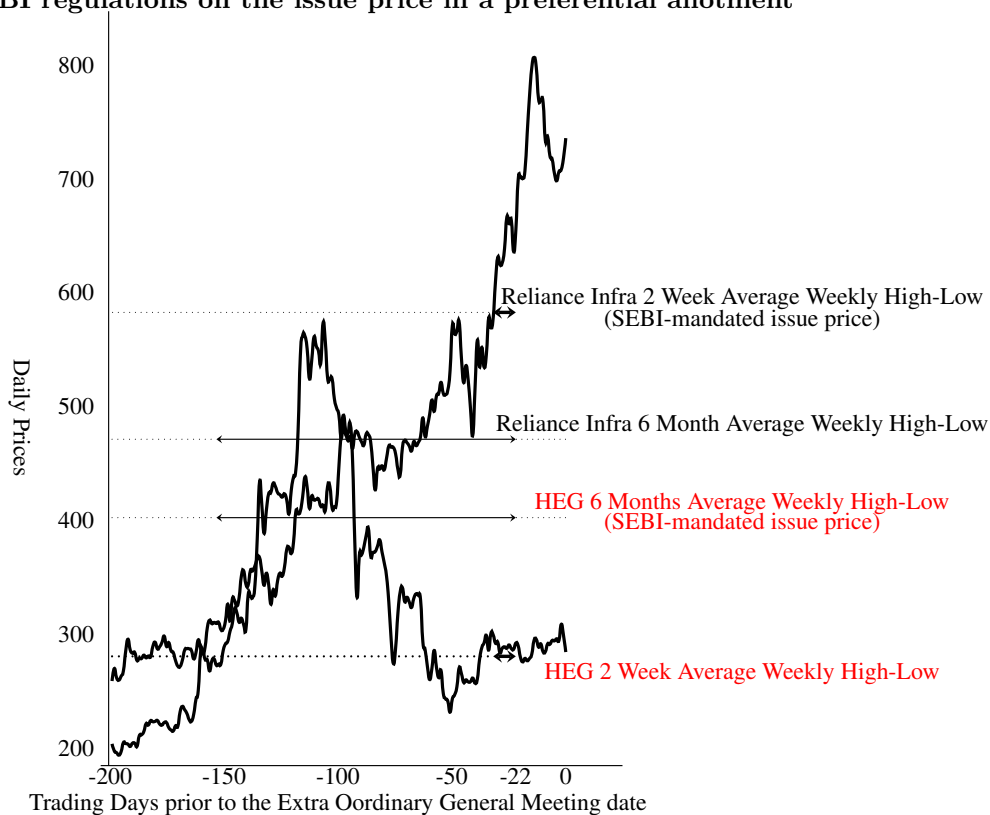
The above figure depicts an example of the preferential allotments of two firms, namely Reliance Infra Limited and HEG Limited. The figure has number of trading days before the relevant date (date 0) on the Xx-axis and the corresponding daily prices for those days on the Yy-axis. As per SEBI regulations, the issue price should be the *higher* of either the two- week average of the weekly High-Low prices or the six- months average of the weekly High-Low prices prior to the relevant date. The relevant date is itself 30 days (or 22 trading days) prior to the date of the Extraordinary General Meeting of shareholders held to approve the issue. Hence, for Reliance Infra, the SEBI-mandated issue price is the two- week average weekly High-Low price, whereas, for HEG, the SEBI-mandated issue price is the six- month average weekly High-Low price.

Figure 1 illustrates the SEBI pricing rule. For the purposes of illustration, the price histories of two firms, Reliance Infra and HEG, are displayed on the graph. For Reliance Infra, prices had been increasing. Thus, the average price in the two- week period prior to the relevant date is *greater* than the average price in the six-month period prior to the relevant date. SEBI rules force the firm to issue new equity at a price greater than (or equal to) the higher of these two prices, namely, the average price in the two-week period prior to the relevant date.

Exactly the converse situation arises for HEG, whose prices had been generally declining. SEBI pricing rules imply that the issue price should exceed the average price in the six-month period prior to the relevant date. In general, if prices are declining, the (lower bound on the) issue price is determined by the historical average price, and if prices are increasing, the (lower bound on the) issue price is determined by more recent period valuations. This arrangement ostensibly protects minority shareholders from managerial self-dealing.[5]

3   Model and Testable Implications

We now present a variation of the Myers and Majluf (1984) model to for analyze analyzing private placements. In this economy, firms are managed by an individual shareholder or a subset of shareholders (we refer to these investors as owner-managers). Consider a firm that faces a positive NPV investment opportunity. The firm does not have enough resources to fund this project internally - it has to be funded with external capital. It can raise capital either in the form of an equity issue to outsiders (we refer to this as outside equity or *"OE"*)[I cant see a reason to use quotes here as well as italics], or in the form of a rights offering (we refer to this alternative as *"RO"*), or in the form of a private placement to the owner-managers, or private equity investors or other associates such as banks. We refer to private placements to owner-managers as *"OM"* and private placements to a combination of owner-managers and private equity investors as *"PE"*. The basic model considers only private placements to owner-managers only.[6] Later, we

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[5]In addition to pricing restrictions, there is also a "lock-in" period of three years from the date of allotment. This rule prevents "flipping" by preferential allottees for short- term gains based on privileged information. SEBI's norms require the issuer to provide the following information to the stock exchange: (i) The objective of the preferential allotment, (ii) The the intention of the promoters and other related parties to subscribe for the offer, (iii) The the share holding pattern before and after the offer, (iv) The the proposed time within which the allotment will be completed, and (v) The the identification of the proposed allottees and the percentage of post-preferential issue capital that may be held by each of the promoters. These disclosures are meant to provide transparency regarding the use of the proceeds of the issue as well as the process of allotment of the issue to investors.

[6]Private placements to owner-managers differ from rights issues, which are offered to all shareholders on a pro-rata basis. In terms of modeling, a rights issue is conceptually a hybrid between a private placement and

consider the implications of private placements to a combination of owner-managers and private equity investors. The firm also has the choice of rejecting the positive NPV project, thereby underinvesting (we refer to this situation as *"UI"* for "Underinvestment"[note change to straight quotes] or "No Issue"). Similar to the Myers and Majluf setup, we only consider only equity capital as a new financing choice, on under the assumption that the capital structure choice has already been made.[7]

There are three dates in our model: τ= -1, 0 and +1. Firm value consists of three components: value due to assets-in-place (AIP), hidden value (HV), which characterizes the asymmetric information about assets-in-place, and value due to a positive NPV investment opportunity (IO), about which there is no information asymmetry.

The payoffs on the three components of the firm value are uncertain at date τ= -1, but realizations of all these payoffs occur on the liquidation date τ= +1. To keep the model simple and intuitive, we consider a two-state economy (with equal probabilities in each state). Thus, all payoffs arise in a binary form. Further, we assume risk-neutral participants and normalize the risk- free rate to 0, without loss of generality. Figure 2 provides an overview of the model structure, which is described in detail below.

3.1 Assets-in-Place (AIP):[use subsection?]

At date $\tau = -1$, the market views the firm as consisting of assets-in-place, whose terminal (date $\tau = +1$) payoff is of the form $\{s, 0\}$ with equal probability. The up-state payoff s is itself a random variable; at date $\tau = -1$, the market believes that s can either be h (for "high") or l (for "low") with equal probability. At date $\tau = 0^-$, the market learns whether s is h or l with certainty and updates its assessment of assets-in-place to either $\{h, 0\}$ or $\{l, 0\}$ depending on the realization of s. It should be emphasized that there is no information asymmetry between the owner-managers and the market regarding any of these parameters describing the assets-in-place. This characterization of the dynamics of the assets-in-place value allows us to capture the essence of SEBI's regulatory framework with regard to the issue price of a preferential allotment in a stylized manner. Henceforth, we will refer to the price path dynamics as being under a "high price path" (when $s = h$) or under a "low price path" (when $s = l$).

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an outside equity issue because some existing shareholders (owner-managers) are informed while the remaining shareholders are uninformed (as would be the case for outside equity participants).

[7]Later on in the paper, we discuss the effect of the current leverage of the firm on the choice among between the three alternatives.

3.2 Hidden Value (HV):[change to subsection so numbering automatic?]

The market believes that there could be hidden value (or a lack of it) in the firm, in addition to the value of the assets-in-place. Hidden value takes the form of outcomes $\{t, 0\}$ with equal probability, where t itself is a random variable that is uniformly distributed over the range $\{-H, H\}$. Thus, hidden value can be favorable news or unfavorable news. The random variable t captures asymmetric information in the context of the model, in a simple fashion. Both the market and the owner-managers are equally uninformed about the value of t at date $\tau = -1$, and hence, there is no information asymmetry on that date. At date $\tau = 0^-$, owner-managers privately observe a private [no need for both privately and private. You could use either one]signal of t, which helps them take to make a call on their investment-financing decision.

3.3 Investment Opportunity (IO):[use subsection?]

At date $\tau = -1$, the market becomes aware of a positive NPV investment opportunity that the firm possesses. This investment opportunity requires an investment of I and yields cash flows $CF = \{x, y\}$, at date $\tau = +1$ with equal probability. Both tThe market and the owner-managers are symmetrically informed about the nature of the payoffs on the investment opportunity. Since the project has a positive NPV, it impliesthe implication is that $I < \frac{1}{2}(x + y)$.

It is important to that we clarify our modelling choices about the structure of information. First, one could model the value of assets-in-place (AIP) as simply s, instead of a random binary variable $(s, 0)$. In a similar vein, we could also have defined hidden value (HV) as t instead of a binary random variable $(t, 0)$, and the cash flows from the project as a non-random quantity, instead of a binary random variable, (x, y). Our information structure is only slightly more complex than the minimum required, but it gives the realistic flavor of postponing uncertainty resolution about cash flows from the asset-in-place (AIP) and the project until the last possible date.

Second, on the terminal date $\tau = 1$, the worst realization of t, which is a signal for the hidden value, is $-H$, and the worst possible realization of the value of the assets-in-place (AIP) is 0. If the firm chooses not to invest in the positive NPV investment opportunity, this worst case scenario could result in negative asset prices. We ensure positive prices in the economy by assuming that the value of the assets-in-place consists of a deterministic part and an uncertain part (given by $s, 0$). The deterministic part is assumed to be sufficiently positive to preclude the

possibility of negative asset values.[8]

At date $\tau = 0^-$, the market sees the realization of s and then the owner-managers observe a private signal (t) about the hidden value (HV). The main objective of the model is to capture the investment-financing decision of the owner-managers. Owner-managers can choose among the following alternatives: (i) issue equity to outsiders (OE) and invest in the positive NPV opportunity, or (ii) issue equity using the rights offering alternative (RO) and invest in the positive NPV opportunity, or (iii) issue equity to themselves, using the preferential allotment mechanism (OM) and invest in the positive NPV opportunity, or (iv) reject the project and underinvest (UI).

The time-line of showing when the information revelation is revealed and the choices available are is summarized below in Figure 2.

Figure 2: Schematic Description of the modelModel
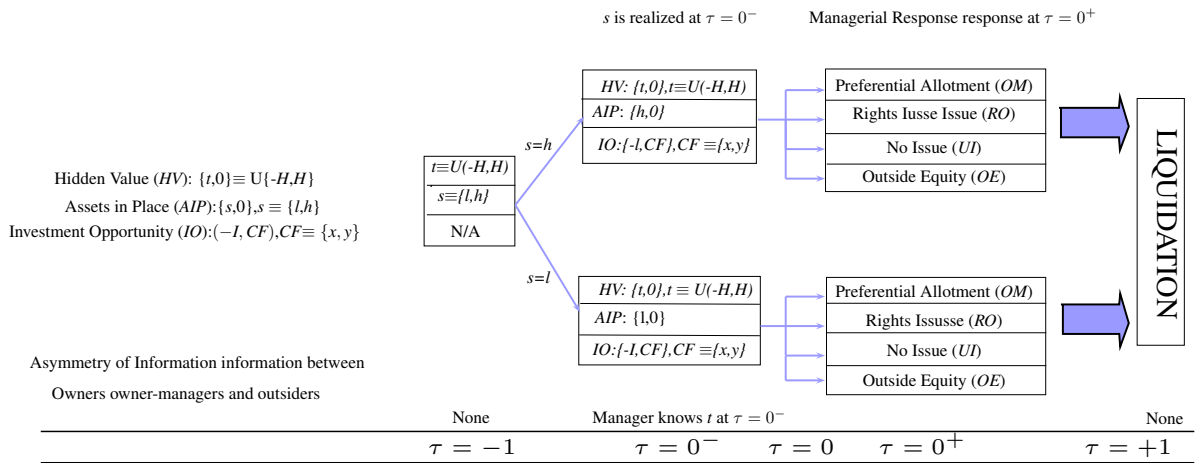
3.4 *Summary of key assumptions:*[use subsection?]

We now summarize the main assumptions made in the model:

1. Firm value consists of value due to assets-in-place (AIP), which consists of a deterministic part, normalized to 0, and an uncertain part, which is described by an equal probability binary random variable ($s, 0$), and a hidden value (HV), which is described by an equal

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[8]Without loss of generality, we set the deterministic part to be equal to 0 for convenience.

probability binary variable $(t, 0)$. Owner-managers face a positive NPV investment opportunity, which requires an investment I, and throws up cash flows described by an equal probability binary random variable (x, y). Firms are allowed to raise equity in the form of public issues, rights offerings, or preferential allotments to owner-managers.

2. The issue price in a preferential allotment is subject to regulatory constraints - in essence, preferential allotments can be made at a price *no less than* the maximum of the most recent firm value or and the average firm value during the previous period (this assumption captures the essence of the SEBI regulations on the issue price in a preferential allotment).

3. Owner-managers own a fraction α of the firm and maximize the liquidation value of their total holdings (as on date $\tau = +1$).

4. There is information asymmetry only about the existing assets of the firm, but and not about the positive NPV investment opportunity. Owner-managers observe a private signal (t), which determines the hidden value associated with the existing assets of the firm.

5. Debt financing is ruled out.

6. The firm has no financial slack and the entire investment in the positive NPV project has to be raised through equity financing. Due to regulatory restrictions, the firm cannot issue issue stock in excess of the investment in the project.

7. All participants in this economy are risk-neutral. The risk-free rate is normalized to 0 without loss of generality.

8. There are no taxes and transaction costs in the model.

9. There are no agency problems among owner-managers.

Assumptions # 1 and # 2 describe the nature of the problem being examined in this model. Assumption # 3 is consistent with the assumption in Wu and Wang (2005), but different from the original Myers and Majluf (1984) model, where managers maximize the weighted average of the current and future share value of the firm. The only critical assumption in the above depiction of the model is Assumption # 4, which states that there is information asymmetry only about existing assets, but and not about the investment opportunity. Employing this simpler set-up allows us to focus on the key implications of this model, with while providing much greater insight into the factors that drive the results of the model. This assumption is relaxed in Appendix 1, where information asymmetry exists about *both* the existing assets and the NPV of

the project. We show there that the results developed in this section continue to hold in the more general setup. Assumptions # 5-9 are purely for convenience in establishing the results and the model is robust to the relaxation of these assumptions. Assumption #6 is made partly for convenience, but also to stay within the spirit of the regulatory constraints on preferential allotments.

Before proceeding further, note that firm value at each point of in time depends on the information available to the market at that point of in time. Let $V_{0^-}(s)$ denote the pre-announcement (date $\tau = 0^-$) market value of the firm. This value will be given by the sum of the market value of the assets-in-place (AIP), the market expectations of the hidden value (HV) and the NPV of the investment opportunity (IO), which is equal to $\frac{x+y}{2} - I$. On this date, the market's expectation of the hidden value (HV) is zero.[9] Furthermore, at date $\tau = 0^-$, the expected value of the assets-in-place (AIP) is equal to $s/2$. It follows that $V_{0^-}(s = h) = \frac{h}{2} + \frac{x+y}{2} - I$ and $V_{0^-}(s = l) = \frac{l}{2} + \frac{x+y}{2} - I$, and in general, $V_{0^-}(s) = \frac{s}{2} + \frac{x+y}{2} - I$. If V_{-1} denotes the market value at time $\tau = -1$, then $V_{-1} = V_{0^-}(s = h)\frac{1}{2} + V_{0^-}(s = l)\frac{1}{2} = \frac{h+l}{4} + \frac{x+y}{2} - I$. Note that $V_{0^-}(s = h) > V_{-1} > V_{0^-}(s = l)$.

SEBI regulations require that the issue price in a preferential allotment should be at least as high as the higher of the historical average of past prices and the current (most recent) price levels at the time of the preferential allotment. Starting from date $\tau = -1$, prices can either go up ($s = h$) or down ($s = l$). On the high price path, the historical average price would be lower than the most recent price, whereas on the low price path, the historical average price would be greater than the most recent price. Thus, on the high price path, SEBI regulations require that the issue price should be at least as high as the current price. Conversely, on the low price path, SEBI regulations imply that the issue price has to be greater than the historical average price. This means that, when $s = l$, owner-managers who buy shares in a preferential allotment pay an additional premium over and above the current market value. The following proposition and later corollary[the corollary is much later on so may be put section number?] describes the owner-managers' decision- making calculus at date $\tau = 0$.

Proposition 1. There is no underinvestment in the economy, i.e., all positive NPV projects will be taken up. The owner-managers' investment-financing decision can be summarized by a threshold cutoff, $\hat{t}(s) = \frac{h-s}{4}$. For all $t < 0$, the firm chooses the outside equity alternative (OE),

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[9]It is shown in Appendix 1, Section A.1.1 that this claim holds true in equilibrium, after one accounting accounts for the financing and investment decision of the owner-managers.

for all t : 0 < t ≤ t̂(s), the firm prefers the rights offering alternative (RO), and for all t ≥ t̂(s),
the firm chooses the preferential allotment alternative (OM).

Proof: See Appendix 1.

The owner-managers' financing choice depends on t, the signal of hidden value that they privately observe at $\tau = 0^-$. Proposition 1 states that, if $s = h$, i.e., if the price path dynamics is move along the "high price path", the cutoff $\hat{t}(h) = 0$. This implies that owner-managers issue equity to outsiders only if they observe a negative signal ($t < 0$); otherwise they issue equity to themselves through the preferential allotment mechanism (if $t > 0$). The results of the proposition are intuitive: this situation ($s = h$) corresponds to the classic Myers and Majluf (1984) world, under the additional assumption that insiders are allowed to finance the project. Note that the rights offering alternative is never taken up in this case.

In contrast, when $s = l$, i.e., when the price path dynamics follows the "low price path", $\hat{t}(s) \equiv \hat{t}(l) = \frac{h-l}{4}$ is strictly greater than 0. As in the above case, if the signal is bad ($t < 0$), owner-managers prefer to issue equity to outsiders. If the signal is substantially good ($t \geq \hat{t}(l)$), owner-managers prefer to issue equity to themselves (assuming, as we do, that they are not financially constrained). For weakly positive signals ($0 \leq t < \hat{t}(l)$), the intermediate alternative of a rights offering works out betteris preferred.

The reason for this asymmetric decision -making by owner-managers (with regard to $s = h$ and $s = l$ cases) is the SEBI-mandated regulatory constraint on the issue price in a preferential allotment. SEBI regulations state that the issue price should be greater than the maximum of the most recent valuation and the average valuation over the previous six- month period. When $s = h$, SEBI regulations require the preferential issue to be priced at least as high as the most recent valuation. This requirement implies that aims to make the issue[or ensures that the issue is] can be "fairly priced". On the other hand, when $s = l$, the preferential issue has to priced at least as high as the historical average valuation, which, by construction, is always greater than the most recent valuation because prices are declining along the "low price path". As a result, in the $s = l$ case, owner-managers (as buyers in the preferential allotment) pay a premium over and above the most recent market value of the security. This additional payment causes owner-managers to adopt a more conservative financing policy. In contrast to the $s = h$ case, owner-managers issue equity to themselves (OM) only for sufficiently positive signals of t above a strictly positive

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threshold cutoff value ($\hat{t}(l)$). In the intermediate signal range, the rights offering alternative is the preferred alternative.

To establish the above result formally, it is useful to examine the opportunity gains (costs) faced by owner-managers when opting for each of the four alternatives: OE, RO, OM, and UI. First, if owner-managers forgo the project (UI alternative), their opportunity loss would isbe $-\alpha NPV = -\alpha(\frac{x+y}{2} - I)$, noting that owner-managers hold a fraction α of the firm. Now consider the OE alternative. In this case, owner-managers face dilution whenever they observe a good signal of hidden value (i.e., when $t > 0$) because the issue price would then reflects a lower firm value than the value based on their private information about the hidden value. Note that the firm value would be is then understated by an amount equal to $\frac{t}{2}$, given that the hidden value takes the form of t in the good state and 0 in the bad state (the probability of each state is $\frac{1}{2}$). If the fraction of the firm sold in the outside equity issue is $f^{OE}(s)$, then the original shareholders, as a group, face a dilution loss of $-f^{OE}(s)\frac{t}{2}$. The opportunity loss of the owner-managers is given by $-\alpha f^{OE}(s)\frac{t}{2}$, where α is the proportionate owner-managers' shareholding. Note that this opportunity loss transforms into an opportunity gain for the owner-managers when t is negative, and the owner-managers would will therefore not mind opting for outside equity for when observing negative signals of t.

Now consider a rights offering (RO), which is conceptually a combination of a preferential allotment and an outside equity offering. When owner-managers observe a good signal ($t \geq 0$), the rights offering imposes both an opportunity gain (they receive a fraction of the shares in a rights offering) as well as a dilution loss (since the remaining fraction of shares is sold to outside equity holders at a discount to the true value). If $f^{RO}(s)$ is the fraction of the firm sold in the rights offering, the opportunity gain of the owner-managers as buyers is $\alpha f^{RO}(s)\frac{t}{2}$. However, as sellers, the owner-managers face an opportunity loss caused by dilution of $\alpha f^{RO}(s)\frac{t}{2}$. These two effects exactly cancel out and the net opportunity gain/loss is zero (this result holds even when $t < 0$.) The intuition for this result is that if the owner-manager subscribes fully to their share , α, of the rights offering and maintains their proportionate shareholding of the firm, they will make neither an opportunity gain nor a loss.

Finally, let us consider the preferential allotment (OM) alternative. This case is slightly more complicated because SEBI's regulatory constraints affect the opportunity gains/losses of the owner-managers. First, we examine the $s = l$ case. As in the case of rights offerings, owner-

managers play a dual role - as buyers in the preferential allotment and as (part) owners selling a stake in the firm. However, unlike in the case of rights offerings, these two effects do not offset each other, in general. First, owner-managers (as buyers) also face an opportunity gain when $t > 0$ because they buy undervalued shares. If the fraction of shares issued in the preferential allotment is $f^{OM}(s = l)$, this opportunity gain is given by $f^{OM}(s = l)\frac{t}{2}$. Second, owner-managers (as buyers) would pay an additional premium due to SEBI's regulatory constraints, which require the firm to issue shares at the higher historical average price rather than the most recent market price of the firm. This difference can be shown to be equal to $\frac{(h-l)}{8}$ (see Equation 10, Appendix 1). Thus, the opportunity loss due to this additional premium is given by $-f^{OM}(s = l)\frac{(h-l)}{8}$. Taken together, the net gain of for owner-managers in their role as buyers is equal to $f^{OM}(s = l)[\frac{t}{2} - \frac{(h-l)}{8}]$.

The original shareholders, as a group, lose whatever the buyers gain. Thus, the original shareholders, as a group, would lose $f^{OM}(s = l)[\frac{t}{2} - \frac{(h-l)}{8}]$. However, because the owner-managers hold only a fraction α of the firm, they will face only a fraction of α of this cost in their role as owner-managers. Now consider the overall effect on the owner- managers: as buyers they gain $f^{OM}(s = l)[\frac{t}{2} - \frac{(h-l)}{8}]$ but as sellers, they lose $\alpha f^{OM}(s = l)[\frac{t}{2} - \frac{(h-l)}{8}]$. The net effect is an opportunity gain (loss, if negative) of $(1 - \alpha)f^{OM}(s = l)[\frac{t}{2} - \frac{(h-l)}{8}]$. Note that the preferential allotment alternative imposes a reverse dilution effect on the owner-managers. An opportunity gain occurs when t is positive and an opportunity loss when t is negative. The case when $s = h$ can be worked out a as a special case where SEBI's regulatory constraints imply that the issue can be priced at the most recent valuation, i.e., there is no additional premium imposed on the issue price. This implies that the opportunity gain is given by $(1 - \alpha)f^{OM}(s = h)[\frac{t}{2}]$.

The opportunity gain (loss)) lines for the $s = h$ case are shown in Figure 3. The outside equity alternative is shown by the downward- sloping line passing through the origin. The rights offering alternative is represented by the x-axis. The preferential allotment alternative is represented by the upward- sloping line. The UI alternative is represented by the line parallel to the x-axis in the lower quadrants. The $OE(s = h)$ and $OM(s = h)$ opportunity cost lines intersect exactly at the origin. The V-shaped contour that follows the OE opportunity gain line for all values of t below 0 and the $OM(s = h)$ opportunity cost line for all values of t greater than 0 describes the optimal investment-financing decision of owner-managers when $s = h$. For no value of t would the UI alternative be considered worthwhile, since the opportunity loss (gain) under other alternatives would be strictly lower (higher). In other words, there will be *no* underinvestment in the economy. The critical value of t when the owner-manager switches from the OE alternative to

the OM alternative is 0, which is the same as the value of $\hat{t}(h) = 0$, as stated in Proposition 1. It can be seen that the $s = h$ case is simply the Myers and Majluf world where owner-managers face no capital constraints and are allowed to finance projects by investing in the firms's equity at the prevailing market price. Thus, as in the original Myers-Majlus Majluf world, underinvestment is completely eliminated when preferential allotments to owner-managers is are feasible. Note that, rights offerings, per se, can also resolve the underinvestment problem. However, the rights offering alternative is dominated by the preferential allotments alternative (when $t \geq 0$).

Figure 3: Opportunity Gains/Costs when s = h
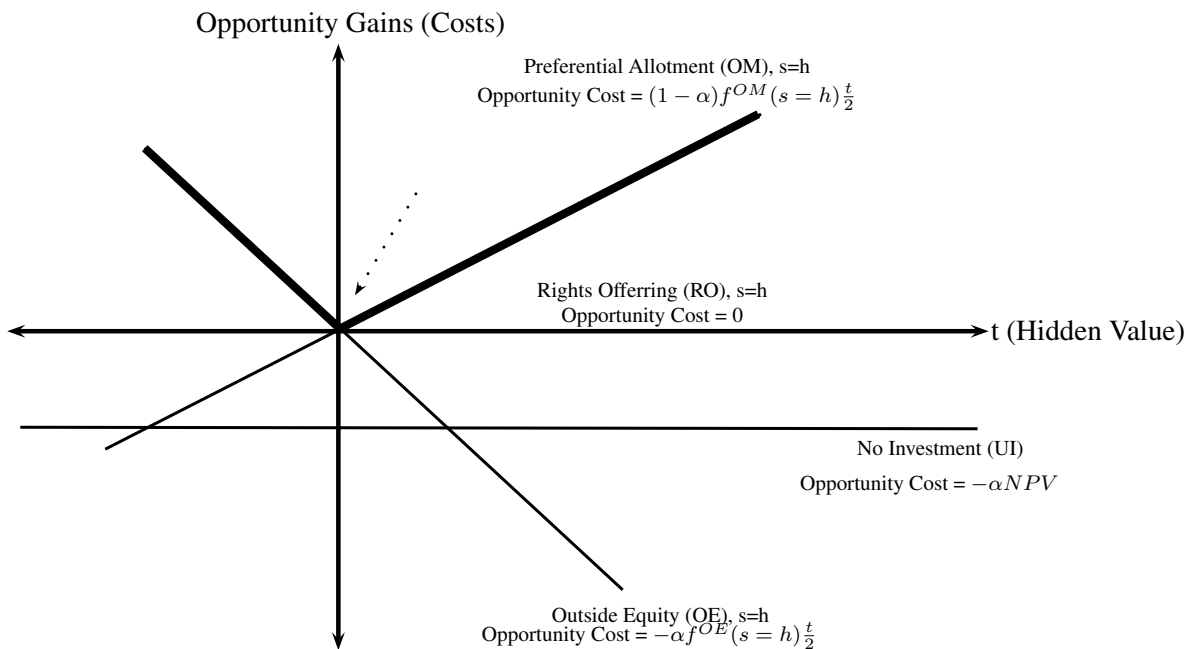
The $s = l$ case is shown in Figure 4. The UI alternative is independent of t, the OE alternative is a declining linear function of t, the RO alternative coincides with the x-axis, and the OM alternative is an increasing linear function of t. SEBI pricing regulations, which apply only in the OM alternative, imply that the y-intercept of the preferential allotment alternative is equal to $-\frac{(h-l)}{8}$, the additional premium paid by [or should this be to?] owner-managers. The bold-faced piece-wise linear portion of the graph represents the optimal financing choices as a function of
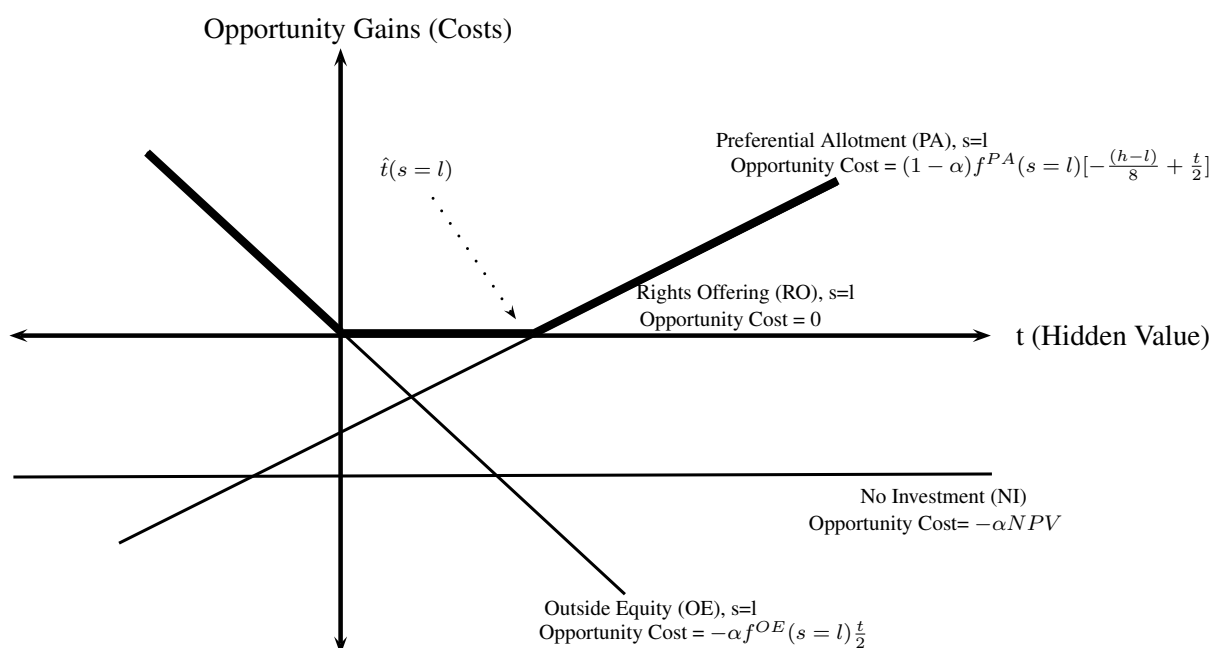
18

t. It can be seen that the UI alternative is dominated by one of the other alternatives at each and every value of t. In other words, in this case too, there will be no underinvestment in the economy. For weak signals of t, outside equity is optimal, for intermediate values of t, the rights offering alternative is optimal, and for good signals of t, the preferential allotment alternative is optimal. The range of t where the rights offering alternative dominates is given by $t \in (0, \bar{t})$, where, $\bar{t}$ is the point where at which the opportunity cost line for the preferential allotment alternative intersects the x-axis. Setting $\alpha f^{OM}(s = l)[\frac{\bar{t}}{2} - \frac{(h-l)}{8}] = 0$, we get $\bar{t} = \frac{h-l}{4}$, which is exactly the same as $\hat{t}(s) = \frac{h-s}{4}$, as discussed in Proposition 1. Note that the rights offerings financing alternative dominates both the outside equity offering and the preferential allotment for all $t \in (0, \hat{t}(s))$.

The optimal investment-financing decision of the owner-managers is slightly different in the $s = h$ case as compared to than in the $s = l$ case. In the former case, the rights offering alternative is sub-optimal, but in the latter case, it serves as the optimal alternative for intermediate values of t, due to regulatory constraints. Otherwise, the financing strategy is similar in both cases; for weak signals outside equity is optimal, and for good signals, preferential allotment is optimal. However, note that owner-managers use a more conservative cutoff when opting for a preferential allotment in the $s = l$ case, in order to recover the additional premium imposed by SEBI regulations on the issue price. Therefore, the signal value has to be sufficiently high to trigger a preferential allotment in the $s = l$ case.

To summarize, the underinvestment situation that arises in the Myers and Majluf (1984) world is eliminated when preferential allotment to insiders and rights offering are allowed.[10] The

[10]If the project has a negative NPV, our model implies that, for extremely good (bad) news about the hidden value, a preferential allotment to owner-managers (outside equity) is will be used. Thus, overinvestment would will occur. For intermediate realizations of the hidden value, the project is will not be taken up (underinvestment). This fact can be easily be verified in graphical terms by considering a negative NPV project in Figure **??**[appears as ?? in pdf]. The opportunity cost of the UI alternative would now will then lie above (and parallel) to the x-axis. The optimal financing plan will be similar to that shown in Figure 4, except that the underinvestment will be optimal for intermediate ranges of t. Because preferential allotments to owner-managers arise only when the good news about the hidden value more than offsets the bad news implicit in the negative NPV project, the information content of a preferential allotment to owner-managers is will be positive even when the project has a negative NPV. For extremely adverse news about the hidden value, the negative NPV project may be taken up with outside equity financing. Outsiders would will still be subscribing to an equity issue in that case, because the issue price is always "fair," conditional on their information set. This would will result in socially sub-optimal overinvestment. Finally, there would will be a positive reaction to underinvestment because the pre-announcement price reflects the negative NPV investment opportunity. The general case of negative NPV investment opportunities is discussed in detail in

Opportunity Gains (Costs)

$\hat{t}(s = l)$

Preferential Allotment (PA), s=l
Opportunity Cost = $(1 - \alpha) f^{PA}(s = l)[-\frac{(h-l)}{8} + \frac{t}{2}]$

Rights Offering (RO), s=l
Opportunity Cost = 0

t (Hidden Value)

No Investment (NI)
Opportunity Cost= $-\alpha NPV$

Outside Equity (OE), s=l
Opportunity Cost = $-\alpha f^{OE}(s = l)\frac{t}{2}$

overall intuition behind this result is as follows. When insiders see "good" information, they are reluctant to issue equity to outsiders due to the dilution of the original shareholders's wealth, because of the information asymmetry between insiders and outsiders. In this model, the information asymmetry-driven "dilution" problem is completely resolved because shares would will be issued either fully (through a preferential allotment) or partially (through a rights offering) to informed insiders rather than to uninformed outsiders when the information is "good". The rights offering alternative is useful for marginally good news that is insufficient to overwhelm the additional costs imposed by the SEBI regulatory constraints. When the information is "bad", shares would will be issued to outsiders, who are always willing to buy them because they are issued at the fair value (SEBI regulations apply only to preferential allotments). Of course, firms may be interested in selling even more equity than they requirement of to funds for the project, which is not permitted by assumption.

3.54 Private Equity Placements[better to use subsection command to automate numbering?]

In this section, we introduce the possibility of private equity players participating in a preferen-

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Cooney and Kalay (1993).

tial allotment. We refer to such private placements as *OM-PE* to consider the general case of financing by a combination of owner-managers and private equity investors. This possibility is worth considering *only* if owner-managers are financially constrained and cannot fully subscribe to a stock issue entirely on their own (the *OM* alternative). Clearly, if owner-managers have sufficient capital, they would will prefer to issuing issue all new shares to themselves rather than sharing the benefits with private equity investors, especially when there is a strong positive signal about the hidden value. Hence, the *OM-PE* alternative is dominated by the *OM* alternative, whenever the latter is feasible. In that case, our analysis in the previous section would have prevailed even if the private equity alternative (*OM-PE*) had been allowed.

In our model, the role of private equity arises only in the context of personal financial constraints faced by owner-managers. In general, there may be other reasons, e.g., managerial expertise or strategic inputs, which might induce an owner-manager to bring in private equity players into a financing arrangement. However, our model is concerned with the financing choices that arise even in the absence of other such positive benefits, and we focus on the capital constraints of the owner-managers as the driving force behind private equity participation.

When owner-managers obtain good signals of about the hidden value (t), but are financially constrained, they would will attempt to convince outside investors of the hidden value in the firm. In this regard, it is probably easier to convey private information to a private equity player than to a set of diffuse set of public shareholders. Clearly, the cost of negotiating a bilateral agreement with a private equity group would be lower than that in an outside equity issue. However, convincing a private equity investor would still be a costly exercise. As argued in Hertzel and Smith (1997), the firm and its owners would incur dead- weight costs of certification in such a case. Instead of modeling the subtleties of negotiation costs, we employ the parsimonious assumption that owner-managers can perfectly communicate their private information (about t) to private equity investors, i.e., private equity investors have the same information as insiders. Our assumption of zero certification costs may seem extreme; however, as we shall see, the qualitative nature of our conclusions will survive richer assumptions about such costs.

The capital resource constraints of owner-managers may be mild or extreme. Suppose we denote let R to be denote the capital available with to owner-managers, and let γ denote the ratio of resources (R) to the investment required for the positive NPV project (I). The ratio, $\gamma = \frac{R}{I}$, captures the extent of the capital constraints of the owner-managers. If $\gamma \geq 1$, the owner-

managers face no capital constraints and the project can be entirely funded by owner-managers in those states of the world that in which they wish to do so, i.e., when t is high. If $\alpha \leq \gamma < 1$ (recall, α is the owners' shareholdings), the capital constraints are mild in the sense that the owner-managers have enough resources to participate in a rights offering (RO), but not enough to participate in a preferential allotment kept entirely to themselves (OM). On the other hand, if $\gamma < \alpha$, the owner-managers can no longer participate even in a rights offering as well as let alone a private placement to themselves. However, in both these cases, the owner-managers can take recourse to partial funding by private equity investors to cover the shortage in funds.

Consider the case of mild capital constraints, i.e., when $\alpha \leq \gamma < 1$. Similar to the opportunity gains expression for owner-managers (OM), we can show that the opportunity gain (loss, if negative) of a preferential allotment to a combination of owner-managers and private equity players (OM-PE) is given by $(\gamma - \alpha)f^{OM-PE}(s)[\frac{t}{2} - \frac{(h-s)}{8}]$, $s = h, l$, where $f^{OM-PE}(s)$ is the fraction of the shares sold to owner-managers in the combination combined OM-PE private placement. Note, that the expression here is similar to that of for the opportunity gain/loss in the case of the pure OM alternative. The key difference is that the term $(1 - \alpha)$ in the OM case is now has been replaced by the term $(\gamma - \alpha)$. This can be explained as follows. As discussed earlier, preferential allotments to owner-managers reflects a reverse dilution effect. An opportunity gain occurs when t is positive and an opportunity loss when t is negative. In the combination alternative, OM-PE, the owner- managers share the reverse dilution benefit with the private equity players, and their net benefit is reduced from $(1 - \alpha)$ to $(\gamma - \alpha)$ rather than $(1 - \alpha)$. As γ approaches 1, the capital constraints become less severe and the OM-PE alternative converges to the OM alternative. When $\gamma = 1$, i.e., when $R = I$, the owner-managers have enough capital to subscribe to the preferential allotment by themselves, and the opportunity gains expression converges to the same one as in the pure OM case.

The case when $\gamma \geq \alpha$ is just a generalization of the opportunity gain/loss in the OM case to account for partial funding by the owner-managers. Note that the point of intersection of the opportunity gains line with the x-axis is the same for both the OM-PE alternative and the OM alternative stays the same. The opportunity gains expression for OM-PE is virtually like that the same as for the OM alternative, except that the slope of the line is less steep lower because $\gamma < 1$.[11]

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[11]Another difference is that the fraction of the firm sold to the owner-managers, $f^{OM-PE}(s)$, will be strictly less than the fraction of shares sold in the case of the OM alternative. This factor also contributes to the reduction in
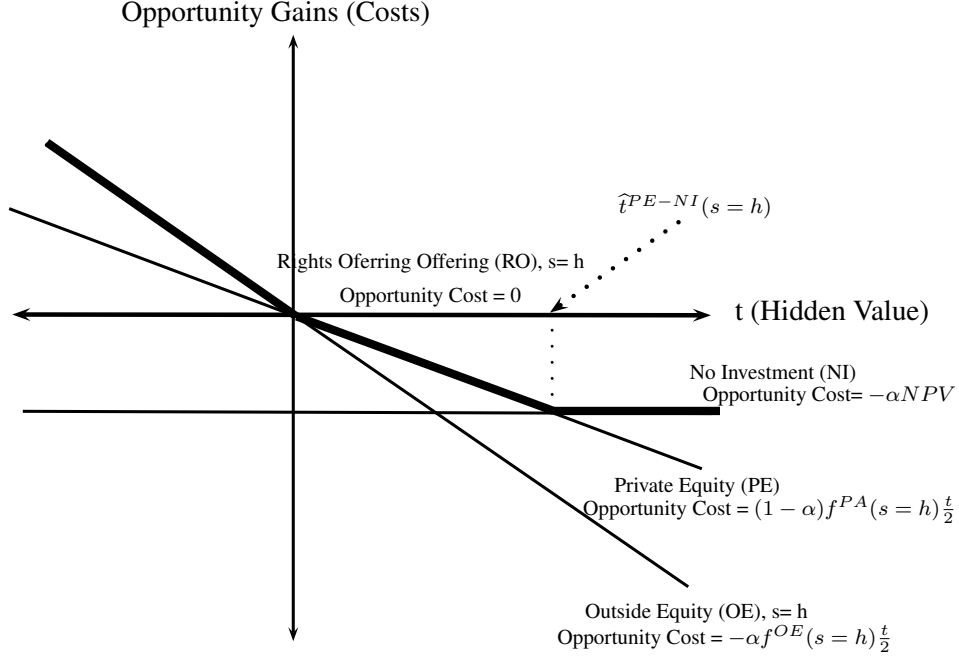
Now consider visualizing the OM-PE opportunity gains line that was depicted in Figure 3. We can see that the OM alternative would will dominate the OM-PE alternative, over the relevant range of $t : t > t(\hat{s})$, because its opportunity gains line has a greater slope, because due to the fact that $\gamma < 1$. This implies that the OM-PE alternative is irrelevant when the owner-managers face no capital constraints. Second, consider the case when where the owner-managers face mild capital constraints such that $\gamma \geq \alpha$. The OM alternative is no longer feasible. This alternative will be replaced by the OM-PE alternative, which has a similar opportunity gains line. The optimal financing policy, will be exactly the same as shown in Figure 3 ($s = h$) and Figure 4 ($s = l$), except that, the OM-PE alternative replaces the OM alternative. Outside equity (OE) will be used when $t < 0$, rights offerings (RO) will be employed for $0 \leq t < t(\hat{s})$, and the owner-manger private equity combination (OM-PE) would will be used for all $t > t(\hat{s})$. Importantly, as in the case of no capital constraints, there is no under investment.

The more intriguing case is the third case, when where $\gamma < \alpha$. Now, the owner-managers are severely capital-constrained and cannot participate in either a rights offering or a pure preferential allotment of shares to themselves. The opportunity gains for the owner-manager private equity combination will still be given by $(\gamma - \alpha) f^{OM-PE}(s)[\frac{t}{2} - \frac{(h-s)}{8}]$. However, since $\gamma < \alpha$, the slope of the opportunity gains line will be negative, as can be seen in Figure 5 (for the case with of $s = h$) and Figure 6 (for the case with of $s = l$). The opportunity gains line of the OM-PE alternative is similar to that of the outside equity (OE) opportunity gains line. This follows because the owner-managers are capturing very little of the reverse dilution benefits; most of it them are goes going to the outside private equity players. On the other hand, because of their ownership stake (α), the owner-managers are facing a costs that are greater than the reverse dilution benefits when they purchase undervalued shares. The net effect is that the private equity alternative becomes similar to the outside equity alternative, except that, in the latter case, the outside investors are unaware of the private signal.

Consider the opportunity gains in the case when where $s = h$, as shown in Figure 5. The OE and UI opportunity cost lines are the same as in the earlier figures. The OM-PE alternative is evaluated as follows. First, because $\gamma \geq 0$, the expression, $\gamma - \alpha \geq -\alpha$. Further, the fraction of the
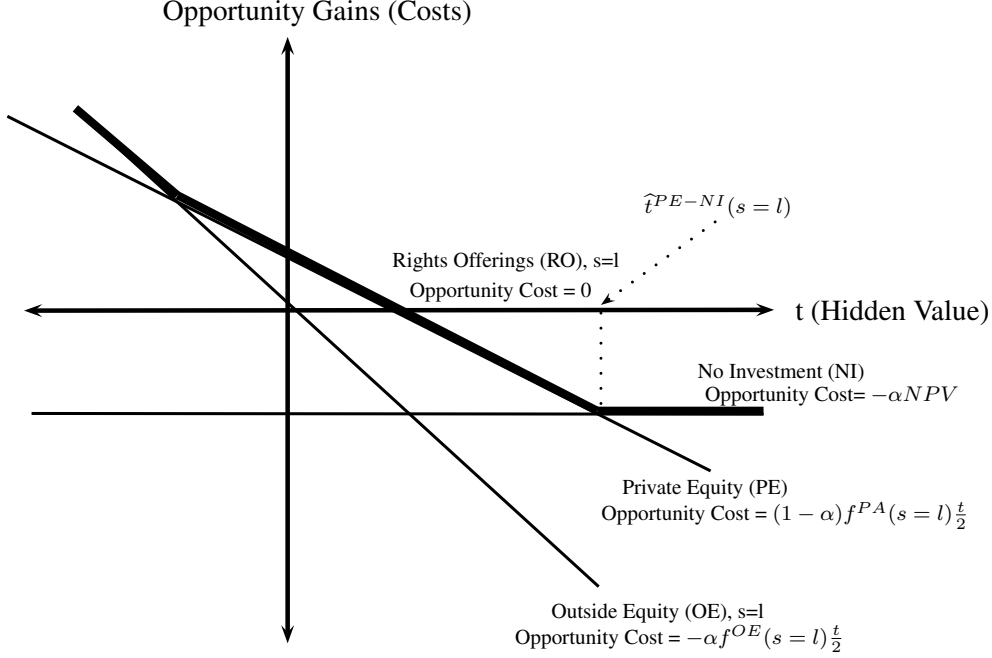
the slope.

Figure 5: Opportunity Gains/Costs when s = h

Opportunity Gains (Costs)

$\widehat{t}^{PE-NI}(s=h)$

Rights Oferring Offering (RO), s= h
Opportunity Cost = 0

t (Hidden Value)

No Investment (NI)
Opportunity Cost= $-\alpha NPV$

Private Equity (PE)
Opportunity Cost = $(1-\alpha)f^{PA}(s=h)\frac{t}{2}$

Outside Equity (OE), s= h
Opportunity Cost = $-\alpha f^{OE}(s=h)\frac{t}{2}$

firm sold to private equity investors reflects the higher valuation they see (as compared to outside equity investors, who are uniformed about t). This implies that $f^{OM-PE}(s=h) < f^{OE}(s=h)$. Taken together, these inequalities imply that the opportunity cost line for the $OM\text{-}PE$ alternative would be is flatter than the opportunity cost line for the OE alternative. The optimal investment-financing decision is captured by the bold-faced line in Figure 5. For $t < 0$, OE dominates, for $0 \le t \le t^{PE-UI}(s=h)$, $OM\text{-}PE$ dominates, and for $t > t^{PE-UI}(s=h)$, the firm under invests (UI). This result is essentially the same as in Myers and Majluf (1984), except that the $OM\text{-}PE$ alternative replaces the OE alternative for intermediate values of t.

Now consider the opportunity gains in the case when where $s = l$, as shown in Figure 6. The net opportunity gains form from a private equity issue would be are given by $(\gamma - \alpha)f^{OM-PE}(s = l)[\frac{t}{2} - \frac{h-l}{8}]$. The opportunity cost line for the $OM\text{-}PE$ alternative is similar to that in the $s = h$ case, except that it is has shifted to the right by an amount $\frac{h-l}{4}$, reflecting the additional premium due to the SEBI regulatory constraints. The conclusions, however, remain qualitatively similar: for $t < 0$, OE dominates, for $0 \le t \le t^{PE-UI}(s = l)$, $OM\text{-}PE$ dominates, and for

Figure 6: Opportunity Gains/Costs when s = l

Opportunity Gains (Costs)

$\hat{t}^{PE-NI}(s = l)$

Rights Offerings (RO), s=l
Opportunity Cost = 0

t (Hidden Value)

No Investment (NI)
Opportunity Cost= $-\alpha NPV$

Private Equity (PE)
Opportunity Cost = $(1 - \alpha)f^{PA}(s = l)\frac{t}{2}$

Outside Equity (OE), s=l
Opportunity Cost = $-\alpha f^{OE}(s = l)\frac{t}{2}$

$t > t^{PE-UI}(s = l)$, the firm under invests (UI).

Our analysis has established that the private equity and the rights offering alternatives will be pursued, if at all, only for intermediate values of t. We have assumed here that there were are no dead weight costs of certification by the private equity investors, either through a lower issue price or other fees. Even if we relax this assumption, the general conclusion that the OM-PE and the RO alternatives would be employed for intermediate values of t, survives. This can be gauged formseen by inspecting Figures 5 and Figure 6 and recognizing that the intercept of the OM-PE opportunity cost line will change due to certification costs, thereby only affecting the range of t over which the OM-PE or the RO alternative dominates.[12] Depending on the capital constraints of the owner-managers, extremely good signals of t will be associated with preferential allotments, possibly with private equity investors (mild capital constraints), or underinvestment (severe capital constraints). Extremely bad signals, of t, will always be associated with outside

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[12]Suppose that the dead weight cost of certification is C. It follows that the opportunity cost expression for the OM-PE alternative would beis given by $(\gamma - \alpha)f^{OM-PE}(s)[\frac{\bar{t}}{2} - \frac{(h-s)}{8} - C]$. The point of intersection of the opportunity cost line with the x-axis shifts to the right. As certification costs increase, the rights offering alternative is will be chosen over a wider range of signals of the hidden value (t).

equity issues. Intermediate values of t will be associated with a rights offering (mild capital constraints) and or private equity (severe capital constraints).

The private equity alternative will compete with the rights offering alternative only in the case of mild capital constraints ($\gamma \geq \alpha$) and when $s = l$. The choice between private equity and a rights offering would beis determined by the dead weight costs of certification and the additional premium due to SEBI-imposed regulatory constraints.[13] As the cost of certification increases, the rights offering alternative becomes more attractive and would be preferable to the private equity alternative. However, for sufficiently high values of t, the private equity alternative would will still be preferred. If the capital constraints are severe, a rights offering is will not be feasible, and private equity is will be preferred for intermediate signals, of t.

To summarize, mild capital constraints leave our results in the previous section intact. Our model is mainly motivated by the desire to understand the optimal investment-financing decisions of family- promoted businesses in emerging markets. Owner-managers of family-controlled firms usually have deep pockets and face less severe capital constraints, than in do public corporations run by professional managers. Our model unambiguously shows that the under investment problem can be resolved by allowing preferential allotments to owner-managers, exclusively, or in combination with private equity players. While this conclusion is intuitively reasonable, our model exploits the institutional peculiarities of an emerging market environments such as India to derive empirically testable implications associated with announcement period reactions of to private placements[is this what you mean ie reactions to announcements of private placements?]. This rigorous framework allows us to examine the importance of information asymmetry in explaining the announcement effects of private placements. When capital constraints are severe, the situation is similar to that in Myers and Majluf (not surprisingly, because in their model, owner-managers are assumed to be risk averse, which is mirrored by capital constraints in our model).

3.65 Empirical Implications[using subsection would automate numbering]

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[13]Recently, SEBI has mandated that rights offerings should also adhere to the issue price constraints imposed on preferential allotments. This change in the rules makes the rights offering a less attractive alternative because owner-managers face a higher costs, in a rights offering than they would otherwise, in a rights offering. In the context of the opportunity gain (loss) figures, this puts the "*RO*" alternative would now be below (and parallel to) the x-axis.

We next explore the comparative statics properties of the critical threshold $\hat{t}(s)$, which determines the cutoff beyond which the owner-managers prefer the preferential allotment alternative.

Figure 7: Owner-Managers' Investment-Financing Decisions and Announcement Period Returns.

$\tau=-1$	$\tau=0^-$	Hidden Value(t)	Financing SEBI formula Formula pricePrice Choice		Announcement effectEffect($\Delta P(s)$)
		$t \geq 0$	OM	$V_{0^-}(s=h)$ Market Value	$\frac{h-l}{8}$
$s=h$	$V_{0^-}(s=h)=$ $\frac{h}{2}+\frac{x+y}{2}-I$				
		$t < 0$	OE	$V_{0^-}(s=h)$ Market Value	$-H/2$
$V_{-1}=$ $\frac{h+l}{4}+\frac{x+y}{2}-I$		$t \geq \frac{h-l}{4}$	OM	$Max\lfloor V_{-1}, \frac{V_{-1}+V_{0^-}(s=l)}{2}\rfloor$ Past Average	$\frac{h-l}{16}+\frac{H}{4}$
$s=l$	$V_{0^-}(s=l)=$ $\frac{l}{2}+\frac{x+y}{2}-I$	$0 \leq \ddot{t} < \frac{h-l}{4}$	RO	$V_{0^-}(s=l)$ Market Value	$\frac{h-l}{8}$
		$t < 0$	OE	$V_{0^-}(s=l)$ Market Value	$-\frac{H}{2}$

Corollary 1.

i. *The critical threshold cutoff, $\hat{t}(s)$, which triggers the preferential allotment to owner-managers, has the following properties:*

$$\hat{t}(h) = 0 < \hat{t}(l) = \frac{h-l}{4}, \frac{\partial \hat{t}(l)}{\partial(h-l)} > 0, \frac{\partial \hat{t}(l)}{\partial \alpha} = 0 \tag{1}$$

ii. *The announcement period reaction associated with a preferential allotment to owner-managers, $\Delta P(s)$, is greater than 0:.*

$$\Delta P(s) = \frac{[\hat{t}(s) + H]}{4} = \frac{1}{16}(h-s) + \frac{H}{4} > 0, s = l, h \tag{2}$$

iii. *The announcement period return associated with a preferential allotment to owner-managers is inversely related to the price path dynamics ($s = l, h$) and the degree of information*

asymmetry about the hidden value (t), as measured by H. Conditional on $s = l$, the announcement period returns are positively related to the degree of uncertainty in the value of the assets-in-place, $(h - l)$, but unrelated to the owner-managers' shareholdings (α).

$$\Delta P(s = h) < \Delta P(s = l), \frac{\partial \Delta P(s)}{\partial H} > 0, \frac{\partial \Delta P(s = l)}{\partial (h - l)} > 0, \frac{\partial \Delta P(s = l)}{\partial \alpha} = 0 \qquad (3)$$

iv. *The announcement period reaction associated with a preferential allotment to private equity investors is lower than the announcement period reaction associated with a preferential allotment to the owner-managers.*

$$\Delta P|_{PrivateEquity} < \Delta P|_{Owner-managers} \qquad (4)$$

Proof: See Appendix 1.

Corollary 1 (i) presents a few properties of the critical threshold cutoff, $\hat{t}(s)$. As discussed earlier, the cutoff is exactly equal to 0 for $s = h$, but strictly greater than 0 for $s = l$. The relationship with $h - l$ and α is can be seen immediately. Corollary 1 (ii) discusses the model's implications about the announcement period effects of preferential allotments to owner-managers. Upon the announcement of a preferential allotment to owner-managers, the market infers that the owner-managers must have seen a private signal, $t > \hat{t}(s)$. Since the hidden value is given by the outcomes $(t, 0)$, where each of the outcomes is equally likely, the unconditional expectation of the hidden value is $\frac{t}{2}$. It follows that the expectation of the hidden value, conditional on a preferential allotment, is equal to $E[\frac{t}{2}|t > \hat{t}(s)]$, which is equal to $\frac{[\hat{t}(s)+H]}{4}$, given that t arises from a uniform distribution over the interval $(-H, H)$. Corollary 1 (ii) states that the announcement period returns for preferential allotments to owner-managers in closed form after substituting for $\hat{t}(s)$. Note that the announcement period return is positive for preferential allotments. The results in Corollary 1 (iii) follow immediately from the above results. Finally, since preferential allotments to private equity investors are made only for intermediate signals of t and preferential allotments to owner-managers are made for extremely good signals of t, it follows that the announcement period reaction of the former is will be less than that of the latter, as stated in Corollary 1 (iv).[14]

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[14]The focus of our study is on preferential allotments, but the model also provides empirically testable implications for outside equity issues. The model suggests that the average inferred news about t, conditional on the announcement of an outside equity issue, is negative, *a[needs a grave accent] la* Myers and Majluf (1984). This implication is a well-documented empirical phenomenon across the world. The model also implies that rights

3.76 Manipulation

From an economic growth perspective, private placements to owner-managers are a positive institutional arrangement.[15] However, the price at which these shares are issued to insiders is critical because managers may have incentives to manipulate share prices (in order to issues shares to themselves at a discounts to their true value). Mechanisms such as the SEBI-mandated issue price regulations try to mitigate reduce the potential benefits of manipulation, since owner-managers are forced to issue shares at a historical average price rather than at the most recent valuation (as would be the case of in an outside equity issue). This feature of the SEBI regulations allows the market to preserve the potential social benefits of preferential allotments, without causing an adverse effect on the minority shareholders's welfare. The fact that SEBI has put in place such a regulation in place indicates that manipulation is a serious concern for regulators. In this subsection, we formulate a generalized version of the model that accounts for the manipulation incentives of owner-managers and derives testable empirical implications in their presence.[16]

Below We we sketch below a simple formulation of manipulation, where owner-managers can bring down the price level per share (before announcing the preferential allotment) by an amount w.[17] Owner-managers benefit from manipulation because they are able to issue shares at a lower price (by an amount equal to w) than otherwise. Obviously, owner- managers would want to

offerings will be associated with positive announcement period effects, albeit less strong ones than in the case of private placements.

[15]The discussion here does not deal with possible "tunneling" activity where owner-managers siphon resources from the new project. See Bertrand et al. (2002), for an analysis.

[16]In this paper, our objective of empirically testing the model on Indian securities market data can be achieved by taking the SEBI pricing rules as exogenously given. In general, from a policy perspective, it may be useful to develop a model of optimal regulation where the issue pricing rules in preferential allotments are endogenously derived.

[17]Models of manipulation can be classified into trade-based manipulation models [Allen and Gorton (1992), Brunnermeier (2000)], information- based manipulation models [Benabou and Laroque (1992)] and action-based manipulation models [Bagnoli and Lipman (1996)] manipulation models. In trade-based manipulation models, prices are manipulated using sophisticated trading strategies. In information-based manipulation models, prices are manipulated by the strategic release of news about a firm. The classic popular legend regarding Nathan Rothschild's alleged opportunism during the Battle of Waterloo illustrates this style of manipulation. With the help of carrier-pigeons and a network of spies, Rothschild came to know, much long before other traders in London, that the Duke of Wellington was about to defeat Napolean Napoleon in the famous Battle of Waterloo. He asked his agents to vigorously sell consol bonds (perpetual treasury bonds) issued by the U.K. Treasury. Seeing this, other traders began to liquidate their inventory of consols. Rothschild mopped up all these bonds at incredibly cheap low prices levels. When the news about England's success in the battle finally broke out, Rothschild's strategy of manipulating consol prices paid handsome dividends! Other observers may attribute the profits to shrewd analysis. Finally, in action-based manipulation models, profitable trading positions are taken up just prior to a critical action that is initiated by a related party (for instance, a takeover bid may be announced).

increase w by as much as possible. However, it is reasonable to assume that manipulation is a costly exercise that may involve dead weight (fixed) costs and increasing marginal costs, as suggested in the market microstructure literature (see Kyle (1985) and other studies on the price impact of trades), and, because manipulation is an illegal activity, direct penalty costs as well as reputation costs. These costs are likely to be increasing in the degree of manipulation and it is safe to assume that manipulation will be bounded within abovean upper limit due to such costs. Even within this upper limit - a breakeven level of manipulation, beyond which the costs of manipulation exceed the benefits of manipulation - owner-managers may prefer to choose an interior level of manipulation (w^*) depending on the marginal costs and benefits of manipulation. For the purposes of our paper, the exact nature of such an optimization exercise is of secondary importance. Therefore, we generalize our model under the assumption that the owner-managers choose a level of manipulation given by w^*, where w^* has been determined from through an exogenously specified optimization exercise.[18]

The effect of manipulation on our base case model (without the resource constraints of on owner-managers) can be seen in Figure 4.[19] The slopes of the opportunity cost lines for OE and OM ($s = l$) change as the fraction of shares sold increases, due to the lower (manipulated) issue price. The net result is that both lines become steeper - the OE opportunity cost line rotates clockwise and the OM opportunity cost line rotates counterclockwise. However, the important point to note is that the OM opportunity cost will continue to intersect the x-axis at the same cutoff, $\hat{t}(s) = \frac{h-s}{4}$. This can be seen from the expression for the opportunity costs of the OM alternative,. It is given by $(1 - \alpha)f^{OM}(s = l)[\frac{t}{2} - \frac{(h-l)}{8}]$. As the level of manipulation (w^*) increases, f^{OM} increases (reflecting the fact that a greater number of shares have to be sold at the lower manipulated price). However, the x-intercept is driven by the term in the square brackets, $[\frac{t}{2} - \frac{(h-l)}{8}]$, which yields the same cutoff value of $\hat{t}(s) = \frac{h-s}{4}$. The key implication is that the announcement period reaction of to preferential allotments would continue to remain at the expected level stated in Corollary 1 (ii), and would therefore, be independent of the degree of manipulation in this information -asymmetry- based model.[20] This result provides the basis for a testable empirical implication[should this be plural? of the model, as will be discussed below.

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[18]We discuss the nature of such an optimization exercise in Appendix 1.

[19]The case of with resource constraints, when raising funds from private equity may be optimal, can be analyzed in a similar fashion, with appropriate modifications.

[20]If the rights offering alternative is excluded, one can show that the cutoff value of t that triggers a preferential allotment is decreasing in the degree of manipulation, and therefore, the announcement period returns would be decreasing in proxies for manipulation.

3.7 8 Testable Hypotheses[change to subsection?]

We formulate the following hypotheses based on our model and the extant literature. Hypotheses H.1-H.5 are based on the empirical implications arising from the model and we refer to these collectively as the Undervaluation Hypotheses.

3.7.1 Hypotheses Based on the Model:[change to subsubsection?]

H.1 *On average, the announcement period price reaction for to preferential allotments should be positive.*

H.2 *On average, the announcement period price reaction should be more positive if the preferential allotment occurs after a low price path (s = l), compared to an allotment than if it occurs after a high price path (s = h).*

H.3 *Conditional on a preferential allotment to the owner-managers being made after a low price path (s = l), the announcement period price reaction should be positively related to the volatility of returns.*

H.4 *Conditional on a preferential allotment to the owner-managers being made after a low price path (s = l), the average announcement period reaction should be unrelated to the owner-managers' pre-announcement shareholdings (α).*

H.5 *On average, the announcement price reaction of to preferential allotments to private equity investors should be lower than the reaction to of preferential allotments to owner- managers.*

Proposition 1 shows that the manager's choice of financing depends on the signal of the hidden value (t), and whether $s = h$ or $s = l$. The owner-managers favor preferential allotment for positive signals of t, when $s = h$, and for sufficiently positive signals of t, when $s = l$. Hypothesis H.1 states that announcement period reactions, on average, should be positive for preferential allotments. It follows from Corollary 1 (ii).

Hypothesis H.2 discusses the impact of the price path dynamics. When $s = l$, the SEBI-imposed formula issue price formula is based on the historical average price, which is greater than the most recent market valuation. The issue price reflects an additional premium, and the owner-managers become more cautious about preferential allotments when $s = l$ than when $s = h$. Owner-managers would they choose a higher cutoff, $\hat{t}(s)$), for the $s = l$ case. The announcement period reaction to preferential allotments when $s = l$ would, therefore, be greater than

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when $s = h$, because preferential allotments in the former case occur more selectively (i.e., for higher signals of t).

Hypotheses Hypothesis H.3 also follows directly from Corollary 1 (iii). First, the announcement period reaction is positively related to H, which captures the magnitude of information asymmetry about the hidden value (HV). Further, the announcement period reaction is positively related to $(h - l)$, which captures the uncertainty in the value of the assets-in-place (AIP). Now, since the volatility of returns is positively related to uncertainty about both the hidden value and the assets-in-place, it follows that the announcement period return should be increasing in the volatility of returns (Hypothesis H.3). In terms of intuition, more volatile stocks imply a greater amount of information uncertainty (H), as well as a higher additional premium (which depends on $(h - l)$, due to the SEBI-mandated issue-pricing restrictions). As can been seen from the expression for the announcement period returns, it is increasing in H and $h - l$. Hypothesis H.4 and Hypothesis H.5 follow from Corollary 1 (iii) and (iv).

Our empirical tests are based on a set of preferential allotments issued to all types of buyers (not just owner-managers, but also to private equity firms, banks and financial institutions) because our basic model is applicable in all these cases. Although some of the above predictions are unique to our model (Hypotheses H.2, H.3, H.4, and H.5), the remaining predictions can also arise in the context of alternative hypotheses. For instance, Hypothesis H.1 (positive announcement period returns) is also implied by the Monitoring Hypothesis (private equity players provide better monitoring) as well as the Certification Hypothesis (the presence of private equity is a credible signal of hidden value). Note also that exactly the converse of Hypothesis H.1 is implied by the Entrenchment Hypothesis, which suggests that private placements should be associated with negative announcement period returns because of managerial self-dealing.

Hypothesis H.4 applies to the sub-sample of preferential allotments that follow a low price path ($s = l$). The same implication, as when applied to the entire sample, could also arise in the context of the Entrenchment Hypothesis, which states that high managerial ownership should result in greater self-dealing, and hence, lower announcement period returns. Interestingly, the Monitoring Hypothesis implies that the announcement period reaction should increase in the owner-managers' share-holdings, because the value of monitoring is higher if the manager holds a higher ownership stake. This prediction is exactly the opposite to that from of our model and from that of the Entrenchment Hypothesis. Empirical tests of the competing hypotheses

can, therefore, help us understand the relative validity of the various alternative hypotheses in explaining private placements in the Indian capital markets.

3.7.2 Manipulation Revelation Hypotheses:

Manipulation is an important issue in the context of preferential allotments because it could, by itself, suggest empirical implications similar to those suggested by the information asymmetry explanation proposed in this paper. The announcement of a preferential allotment reveals to the market that the owner-managers might have been manipulating the prices downward in the prior period. The market would then correct itself with a positive adjustment, i.e., the announcement period reaction would be positive. Thus positive announcement effects can arise in the context of preferential allotments to owner-managers due to a fear of manipulation by owner-managers the latter. We refer to this effect as the *manipulation Manipulation revelation Revelation Hypothesis*. It suggests that, in a world of manipulation, preferential allotments should be associated with positive announcement period returns. This effect would arise even without information asymmetry because owner-managers can gain just by buying their stocks at depressed prices. A key implication of the manipulation Manipulation relevance Relevance[Revelation?] hypothesis Hypothesis is that announcement period returns are increasing in the proxies for manipulation.

In contrast, as discussed in the previous section, our information asymmetry- based model, after explicitly accounting for manipulation, concludes that announcement period returns would be independent of the proxies for manipulation. Thus, we can empirically establish whether the data supports the manipulation Manipulation revelation Revelation hypothesis Hypothesis or the Undervaluation Hypothesis (after accounting for manipulation possibilities). Below, we state the predictions of the manipulation Manipulation revelation Revelation Hypothesis. Hypotheses H.6 and H.7 are useful because they present testable propositions that arise only in the context of the manipulation Manipulation revelation Revelation Hypothesis, but and not in the context of the undervaluation Undervaluation hypothesis Hypothesis of the model discussed in this article.

H.6 *On average, the announcement period reaction should be increasing in the illiquidity of the firm's stock.*

H.7 *On average, the announcement period price reaction should be positively (negatively) related to the abnormal returns (abnormal volume) experienced during the six -months prior to the announcement date.*

Hypothesis H.6 follows because illiquidity reduces the costs of manipulating asset prices (market prices move much more in a the direction favorable to the owner-managers for a given amount of investment in manipulation). In the case of illiquid stocks, manipulation is easier and owner-managers would will have greater incentives to manipulate prices, since they would will have a greater "bang for the buck" for the resources they employ for in manipulation. As a result, the abnormal returns would will be higher because the market would will infer the worst upon the announcement of a preferential allotment to owner-managers. As stated in Hypothesis H.6, the announcement period reaction should be increasing in the illiquidity of the stock.

Hypothesis H.7 is based on the same logic, except that it uses more direct proxies for manipulation. Two alternative empirical proxies for manipulation are the abnormal volume and the abnormal return in the six-month period prior to the announcement date. If manipulation (in the period prior to the announcement) causes a depressed stock price, then it would will result in a negative (or a lower) abnormal return during this period than in a world without manipulation. In addition, an indirect indication of manipulation is the abnormal trading volume in the six months period prior to the announcement. Hence, in the presence of manipulation (as measured by a lower abnormal return or a higher abnormal volume in the six- month period prior to the announcement date), the announcement period return would will be lower than otherwise. In other words, the announcement period price reaction should be positively (negatively) related to the abnormal return (volume) experienced during the six-month period prior to the announcement date).

3.7.3 Hypotheses Based on the Existing Literature:

In addition to the hypotheses based on our model, we also test the following hypotheses that arise from the existing literature:

H.8 *Preferential Allotments allotments issued by business group- affiliated firms should experience under-reaction compared to stand-alone firms.*

Baek, Kang, and Lee et al. (2006) find that group firms are able to expropriate shareholder wealth by issuing shares at steep discounts in private placements. As noted earlier, business groups in India often engage in private placements. Given the propensity of business groups to transfer resources across companies (see, for example, did you mean Rajan, Servaes and Zingales(2000)], it is likely that private placements by business groups will be viewed less favorably than private placements made by stand-alone firms. This prediction is also consistent with the Entrenchment Hypothesis.

H.9 *Preferential allotments made to private equity investors should experience a more positive reaction compared than preferential allotments made to banks and financial institutions.*

Hypothesis H.9 is a manifestation of the Monitoring Hypothesis and is confirmed in the studies of Hertzel and Smith (1993) and Barclay et al. (2007). There is evidence to suggest that private equity players are active shareholders (Monitoring Hypothesis) and often possess superior information about the prospects of a firm (Certification Hypothesis). On the other hand, banks and financial institutions are likely to be passive shareholders (Entrenchment Hypothesis), especially in the context of India where preferential allotments to banks are often the result of financial restructuring when debt is stressed. The net effect from any or all of these hypotheses is that the market views preferential allotments to banks and financial institutions less favorably than preferential allotments to private equity players.

The detailed hypotheses discussed above can be related to the various theories advanced in the literature relating to the announcement effects of private placements. To summarize, Hypotheses H.1 - H.5 can be classified as the Undervaluation Hypotheses, H.1, (the converse of) H.4, and H.8 as the Monitoring Hypotheses, H.1 and H.8 as the Certification Hypotheses, H.1, H.4, H.8, and H.9 as the Entrenchment Hypotheses, and H.6 and H.7 as the Manipulation Revelation Hypotheses.

4 Empirical Analysis

In this section, we present our empirical tests of the hypotheses developed in the previous subsection. First, we discuss the construction of the data sample. Then, we provide details of the empirical methodology used to determine the abnormal return and volume measures that are in turn used to test the hypotheses. Finally, we present summary statistics that describe the data and results associated with our tests.

4.1 Construction of the Database[subsection?]

We obtained data from several sources for to building our database of preferential allotments of equity in India. We started with news reports from Bloomberg regarding the announcement dates of preferential allotments of equity. These are were matched with corresponding data obtained from the corporate announcements site of the Bombay Stock Exchange (BSE). Once the firms are had been identified, the details of the preferential allotments (available as .pdf files) are were obtained by searching for each individual firm in the corporate actions dataset on the BSE

website. We manually digitized the available .pdf files, extracting data on issue price, names of buyers, types of buyers, purpose of issuing preferential shares, number of shares issued to each subscriber, and proportion of the shares issued to the total share capital of the firm. Using this procedure, we are were able to obtain a sample of 175 preferential allotments made by BSE-listed firms during the period 2001-2009. In addition, we also obtained firm- level financial, ownership, and stock price data from the Prowess database of the Center for Monitoring Indian Economy (CMIE). These data are were matched with the data on preferential allotments. After the completing completion of the matching exercise, our final sample is had been reduced to 164 preferential allotments, due to the unavailability of firm- level data for some firms.

The definitions used for identifying family business group- affiliated firms and stand-alone firms, as well as the industry classifications of the firms in the sample, are were also obtained from Prowess. (The Prowess industry classification is similar to the three-digit SIC code in the U.S.) Our sample of preferential allotments is spread across 42 industries, with no significant concentration in any one industry. However, software, infrastructure and banking firms each account for more than 5% of the total number of issues.

4.2 Measurement of Abnormal Returns and Abnormal Volume

In order to test the hypotheses related to manipulation, we compute the Cumulative Abnormal Return (CAR) and the Cumulative Abnormal Volume (CAV), over the period prior to the announcement date. Announcement period reactions are estimated by calculating these values around the announcement date. We use the standard single-factor market model to measure the abnormal return on a stock around the announcement date of the preferential allotment. The model is specified as follows:

$$R_{i,t} = a_i + b_i R_{m,t} + \varepsilon_{i,t}, \tag{5}$$

where $R_{i,t}$ is the return to security i at time t, $R_{m,t}$ is the corresponding market return, b_i is the sensitivity parameter estimate for security i, a_i is the intercept term for security i and ε_{it} is the error term. Abnormal return is defined as the estimated error term for a particular security for a given time.

Given that the announcement day of the offer is defined as day 0 in the event window period, abnormal returns are calculated over event window periods of -1, to +1 trading days, -5 to, +5 trading days and -10 to, +10 days around the announcement day of the issue. The estimation

period used to calculate the parameters in Equation 5 comprises returns over days $[-240 \, to -31]$ prior to the announcement day of the issue. The cumulative abnormal return (CAR) of stock i for the -10, to +10 trading days window can be defined as follows (the $CARs$ for the other windows are defined similarly):

$$CAR_{it} = \sum_{t=-10}^{+10} AR_{i,nt} \tag{6}$$

The Cumulative cumulative Abnormal abnormal Volume volume (CAV) is estimated using a model akin to the market model, where the daily volume of a security is regressed on the corresponding day's market volume.[21] We measure market volume as the value-weighted trading volume of the top 1,000 Bombay Stock Exchange(BSE) -listed securities:.

$$V_{i,t} = c_i + d_i V_{m,t} + \nu_{i,t}, \tag{7}$$

where $V_{i,t}$ is the actual volume for the security i on day t and $V_{m,t}$ is the market volume. Abnormal volume is defined as the estimated error term for a given time. CAV, which is similar to CAR, is defined as follows:

$$CAV_{i,t} = \sum_{t=-10}^{+10} AV_{i,t}. \tag{8}$$

We calculate the CAR and CAV for three specific windows, namely CAV(-22,-32), CAV(-22,-154) and CAV(-22,-250). The numbers for the three windows correspond to the respective days before the announcement date. The first two windows are used to capture abnormal volumes during the two periods used to compute the SEBI-mandated issue price. The third window, (CAV (-22, -250), is used to check for robustness.

4.23 Descriptive Statistics[change to subsection?]

Table 1 I reports the descriptive statistics of the sample data. Our sample consists of 164 preferential allotments, of which 91 were made to insiders (promoters or owner-managers), and 73 to private equity players, as well as to banks and other outsiders. The variables in the data are presented under different categories - firm, issue and investor characteristics, and the size of the insider holdings. Since there were a few outliers at either end of the data, we winsorized one percent of the sample at both the high and the low end for the following variables: illiquidity, volatility, interest coverage, and debt equity ratio. The average firm size is Indian Rupees 1,956.35

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[21]The Cumulative cumulative Abnormal abnormal Volume volume (CAV) is commonly used in empirical analysis analyses of manipulation. For example, Sanders and Zdanowicz (1992) uses CAV it while investigating insider trading in corporate takeovers.

million, the average illiquidity (as measured by the Amihud measure of illiquidity) is 6.18%, the average daily volatility (of stock returns) is 4.01%, the average interest coverage is 6.03, and the average debt equity ratio is 0.93. The issue size, on average, is 60% of the promoter's equity or about 16% of the outstanding shares. Owner-managers and private equity investors subscribe to the placements in roughly equal measure at around 45% each, with the balance being subscribed by banks. On average, the owner-managers' stake prior to the issue is 42.39%.

To gain further insights, we stratify our sample in three ways: (1) group affiliation of the firm, if any, (2) the price path ("high" or "low"), which determines the SEBI-mandated minimum issue price, and (3) the type of investor. Group firms, on average, are significantly larger (almost three times) larger than stand-alone firms. In addition, the equity of group firms are is more liquid in the secondary market, but experiences similar volatility levels to those of stand-alone firms. Group firms are more levered, by a large margin, in terms of their interest coverage, than stand-alone firms. In terms of the debt-equity ratio, however, there is no significant difference between the two groups. We can also see that stand-alone firms rely less on private equity as compared than do group-affiliated firms (35.2% vs. 49.5%). Other than the size and extent of private equity investment, there are no other significant differences in the issue characteristics between group-affiliated and stand-alone firms, since the two categories of firms appear to have large cross-sectional variation on both dimension. In particular, we find that issue size and the number of shares outstanding are not significantly different between the two groups.

In a similar vein, we divide the sample into issues that are placed after experiencing a high price path has been experienced and those that are placed after a low price path. The average weekly price in the two-week period prior to the relevant date is compared with the average weekly price in the six-month period prior to the relevant date.[22] If the former (latter) is greater, the price path is classified as a "high (low)" price path. Upon classification of the preferential allotments into those that occur after a "high (low)" price path, we find that there is no significant difference in terms of issue characteristics between these two groups, as shown in Table 1. When the data are stratified by the type of investor, that is, owner-managers (promoters) versus outsiders, we find no significant difference between the two groups, except for in the interest cov-

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[22]The relevant date is itself 30 days (or 22 trading days) prior to the date of the Extra ordinary General Meeting that held to seeks shareholder approval of the preferential allotment. This meeting will occurs soon after the announcement date, but the exact date of the EGM is not readily available for our sample firms. We, therefore, make the assumption that the EGM date coincides with the announcement date. Thus, the relevant date is assumed to be one month (22 trading days) before the announcement date.

erage ratio. The firms in which owner-managers hike their stakes through preferential allotment are, on average, less leveraged to a lesser extent than the others.

The above findings are important because some of the hypotheses being tested apply to the sub-sample of issues that are based either on group affiliation (Hypothesis H.8), or price path dynamics (Hypothesis H.2) or purchaser type (Hypothesis H.9). Overall, the results reported in Table 1 assure us that our empirical tests based on sub-samples are free from any obvious selection bias.

4.34 Announcement Period Returns[change to subsection?]

Table II reports announcement period returns in the form of *CARs* for three different windows [*CAR(-1, +1), CAR(-5, +5)* and *CAR (-10, +10)*] [should these windows be written as square brackets like the earlier ones?]around the announcement dates of preferential allotments.[23, 24] We study these three windows to take into account possible liquidity effects due to thin trading. To the extent that thin trading is an issue, the *CAR(-1,+1)* results are less reliable than the *CAR(-5,+5)* and the *CAR(-10,+10)* results. The table is divided into seven panels, the first one is related to the overall sample, and the other six are based on different classification criteria. The objective of this classification is to examine whether, at the univariate level, there are any significant differences in the announcement period returns across different groups based on Hypotheses H.1-H.5 and H.8-H.9.

Table II, Panel A reports the overall announcement period effects for the total sample of 164 preferential allotment announcements. Consistent with Hypothesis H.1, Panel A reports that the overall announcement period effect for preferential allotments is significantly positive for the 5- and 10-day windows around the announcement date, with the effect for the 1-day window being only marginally significant. This finding is consistent with other empirical studies on private placements.

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[23]As a robustness check, we also computed the CARs with alternative definitions of the windows for estimation ofto estimate the slope coefficients in the market model regressions in Equation 5. In addition, we estimated the CARs with only an adjustment for the market return only - in effect assuming that all the slope coefficients are were one. These alternative estimations yielded qualitatively similar results, which are not reported here in the interest of brevity.

[24]We also examined a longer windows to study the long-term wealth effects of the announcement [*CAR(-1, +480)*] and found, in contrast to Hertzel et al. (2002), that the long- term announcement effects of Indian preferential allotments are also positive. Our results are consistent with Barclay et al. (2007), who argue that positive long-term wealth effects are consistent with the Certification Hypothesis.

We now turn to the announcement effects for various slices of the sample. Panel B and Figure 7[there are 2 fig 7s, 1 in the main body of the paper and one at the end of the paper] indicate that, while the announcement effects for the low -price path are significantly positive, the effects for the high price path are not significantly different from zero. Further, on average, low-price-path issues have significantly higher positive abnormal returns than high-price- path issues in the case of the 10-day window. Both these results are consistent with Hypothesis H.2.

Panel C reports the announcement effect for sub-groups stratified by volatility into those that are below the median and those that are above the median. According to Hypothesis H.3, a higher volatility of returns should imply a greater announcement effects because (i) the market infers more good news from a preferential allotment when the uncertainty about the hidden value (asymmetric information) is high, and (ii) owner-managers follow a more cautious preferential allotment policy when the uncertainty in the value of the assets-in-place is high. The announcement effects for the two sub-groups are significant for the 5- and 10-day trading days, but not as clear-cut for the 1-day window. However, we do not find any statistically significant differences between the sub-groups. The evidence at the univariate level seems to be inconsistent with Hypothesis H.3.

Panel D shows the announcement period returns for preferential allotments, where the owner-managers hold a higher (lower) than median ownership stake in the firm prior to the announcement date. We can see that the announcement period returns are positive for each of the two sub-groups. This univariate result is inconsistent with Hypothesis H.4. Panel E reports the announcement effect for two sub-groups stratified by leverage, measured by the interest coverage ratio, into those that are below the median and those that are above the median. The interest coverage ratio is a better measure of leverage in our case due to the large variation in debt-equity ratios across the sample for firms in different industries. The announcement effects for the two sub-groups are significant in both cases[see previous comment] for the 5- and 10-day windows, but not as clear-cut for the 1-day window. However, we do not find any statistically significant difference between the sub-groups in both cases[do you mean the 5 and 10-day windows? better to say so explicitly as its not clear]. Our model suggests that higher interest coverage (lower leverage) should lead to greater announcement effects. The evidence at the univariate level seems to be inconsistent with Hypothesis H.5.

Panel F and Figure 8[I think this probably needs to change to Fig 9 as there are 2 Fig 7s at the moment] report announcement period returns for group-affiliated firms and stand-alone firms. The *CARs* for the group-affiliated firms are significantly lower than that those for stand-alone firms, for the 10-day window. The results for the other windows are in the same direction, but the differences between the two groups are statistically significant only for the *CAR (-10, +10)* window. This evidence at the univariate level is consistent with Hypothesis H.8. Finally, Panel G and Figure 9[change to 10?] report announcement period returns based on the type of investor, namely, promoters (controlling owner-managers), banks and private equity firms separately (Hypothesis H.9). The announcement period effect indicates that most of the significant positive news from preferential allotments comes from placements to owner-managers. The announcement effect for private equity investors is significant, but only for the 10-day window. Interestingly, the effect for banks is not significant. These results suggest, however, that there are no significant differences in the announcement effects between the investor types.

Overall, the univariate findings seem to support some of the hypotheses that follow from our model; however, we require a more robust multivariate regression analysis that controls for other factors before we can drawing any meaningful inferences.[25]

The Multivariate multivariate regression results are reported in Table III.[26] All regressions use *CAR (-10, +10)* as the dependent variable, since this measure would will be least affected by possible thin-trading effects. The explanatory variables are arranged by category - firm characteristics, issue characteristics, investor characteristics and owner-manager stake. Regressions 1-3 employ the entire sample, but Regression 4 uses a sub-sample of preferential allotments that follow came after a low price path, as required under Hypothesis H.4.

Regressions 2 and 3 test Hypothesis H.2, which states that preferential allotments occurring after a low price path should lead to greater announcement effects. The coefficient on the high price path dummy is significantly negative, indicating that preferential allotments issued after a

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[25]To control for any bias in the estimates due to thin trading we also used a "trade-to-trade" returns approach that is based on multi-period event returns, as proposed by Maynes and Rumsey (1993) to address illiquidity effects. The results based on the thin trade-adjusted market model, although not reported, are similar to the results based on the conventional market model as reported in the Equation 5. It turns out that only four stocks in the sample had any gaps in the data due to non-trading.

[26]To be consistent with our theoretical model, we also ran regressions using only those issues that were made exclusively to promoters (owner-managers). The number of such placements in our sample was 91. The results are qualitatively similar to the results reported in Table III3, which uses the full sample of 164 preferential allotments (with proper controls).

low price path experience higher abnormal returns. Regarding firm characteristics, the announcement date abnormal returns are inversely related to size, a control. As for volatility, Hypothesis H.3 suggests that higher volatility of returns (either due to a greater uncertainty in about the assets-in-place or due to a higher degree of information asymmetry about the hidden value) leads to a greater announcement effect. This conjecture is confirmed in all four regressions.[27] In terms of economic significance, the results indicate that, for a one standard deviation change in volatility, the CAR would rise by 0.957% percent.

As discussed earlier, the model suggests that a more aggressive preferential allotment policy will be used as leverage increases, and therefore,with consequently lower announcement period effects. However, announcement period returns can be mechanically positively related to leverage mechanically, simply because expected returns are inversely related to the proportion of equity, which is decreasing in leverage. Despite this exogenous effect, the empirical results suggest that announcement returns are significantly negatively related to leverage (Hypothesis H.5). It can be seen that, for a one standard deviation change in the interest coverage ratio, the CAR would will rise by 0.06% percent, in the direction predicted by Hypothesis H.5. We also find that the coefficient on the group dummy is negative and insignificant in all the regressions. This result does not support Hypothesis H.8 which states that abnormal returns are lower for group firms than for stand-alone firms. This result is inconsistent with the Entrenchment Hypothesis posited in Baek, Kang, and Lee et al. (2006).

According to Hypothesis H.9, the announcement effects associated with private equity investors should be stronger than those for banks or financial institutions. Regression 3 tests this hypothesis and shows that preferential allotments issued to owner-managers do not clearly experience a clearly higher positive reaction than private equity investors or banks. The signs and magnitudes of the coefficients on the private equity dummy and the banks dummy are in the right direction, but statistically insignificant, i.e., they suggest that there is a rank ordering of announcement period returns, with the highest returns occurring for owner-manager placements and the lowest for bank placements. While the evidence in from Regression 3 is weak, the results in of Regression 4 support our model strongly. The coefficient on the private equity dummy is negative and significant. Private equity investors are often assumed to have superior information (Certification Hypothesis) or assumed to provide take an active role in monitoring the firm

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[27]We also used the volatility of market model residuals - an estimate of the idiosyncratic risk - rather than total volatility of returns and obtained similar results.

(Monitoring Hypothesis). However, these results show that, after accounting for controls, there is no support for Hypothesis H.9, i.e., these findings do no support for the Monitoring Hypothesis (Wruck, 1989) or the Certification Hypothesis (Hertzel and Smith, 1993). This evidence also goes against the Entrenchment Hypothesis, which states that private placements are typically made to acquire passive shareholders and should be accompanied by a negative price reaction.

Regression 4 is specifically designed to test Hypothesis H.4. The regression sample consists *only* of those issues that follow came after a low price path.[28] The hypothesis states that the average announcement reaction should be inversely related to the pre-announcement holdings of the owner- managers. However, the results under the column for Regression 4 column in Table III do not support the hypothesis relating to the owner-manager's stake.[29] To summarize, the univariate tests confirm Hypothesis H.1, and the multivariate regressions suggest provide evidence that appears to be in favor of Hypothesis Hypotheses H.2, H.3, and H.5. Hypothesis H.4 is not confirmed in the empirical tests.

4.45 Testing of the Hypotheses related to Manipulation

As we discussed in the theoretical section on manipulation, owner-managers have incentives to manipulate the stock price level in the period prior to the announcement date of a preferential allotment. Such manipulation would be in the self-interest of owner-managers because they would be able to issue shares to themselves at a price lower than the fair market value. This empirical section examines the extent of managerial self-dealing. It is important to note that our empirical tests ought to control for the fact that the manipulation of prices *prior to* the announcement date can affect the announcement period returns. If the market believes that owner-managers manipulate prices downward prior to announcements of preferential allotments, there would will be a positive announcement effect (manipulation revelation effect). On the other hand, as shown in our model, manipulation induces owner-managers to pursue an aggressive preferential allotment policy, which causes a reduction in the announcement effect. The manipulation revelation effect suggests a positive relationship between announcement period returns and manipulation proxies. In contrast, the aggressive preferential allotment policy effect suggests a negative relationship between announcement period returns and manipulation proxies. It is an empirical question as

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[28] An alternative approach would be to introduce interactive effects between the path dummy and the explanatory variables. However, this would not be in line with the explicit hypothesis our model suggests. In any event, we tried this approach also as well and found that the results were somewhat weaker, as expected.

[29] However, the results are consistent with the extended model presented in Appendix Section A.1.8, which includes a rights offering, *RO*, as a financing choice.

to which of these two effects dominates, which we will examine in this section.

The first manipulation proxy we consider is the illiquidity of the firms' stock. We argue that the greater the illiquidity, the lower is the cost that owner-managers incur if they invest in manipulating the stock price in the period prior to the announcement of a preferential allotment. Thus, we should see a greater degree of manipulation in more illiquid stocks. To measure illiquidity, wWe use the Amihud measure of illiquidity ([Amihud (2002))]. If the manipulation revelation effect dominates, one would see a positive relationship between announcement period returns and illiquidity. On the other hand, if the model's predicted aggressive preferential allotment policy effect dominates, one we should see a negative relationship between announcement period returns and illiquidity.

To probe the manipulation story more deeply, we also use information contained in the price and volume run up before the announcement period to build proxies for the effects of manipulation. The first proxy under this category is the cumulative abnormal volume (CAV) in the pre-announcement period. If there is price manipulation, it is likely to be accompanied by higher abnormal trading volumes. The second proxy is the cumulative abnormal return (CAR) in the pre-announcement period, which is possibly a better indicator of manipulation.[30]

We use two different time windows to define the period prior to the announcement period. As discussed earlier, the SEBI-mandated issue price is based on the maximum of the average price in the two-week period prior to the relevant date and the average price in the six-month period prior to the relevant date. Thus, proxies to assess manipulation should examine these two trading windows prior to the relevant date. The two- week period prior to the relevant date would then be the interval (-22, -32) [should these intervals be square brackets like earlier?]interval relative to the announcement date, assuming that 2 two weeks is equivalent to 10 ten trading days. Hence, we define the two windows to be over the periods (-22, -32), and (-22, -154)[should they be written (-32, -22) and (-154, -22)] .[31] The first window captures price manipulation that affects the most recent valuation and the second window captures price manipulation that affects the six-month average price.

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[30]As a robustness check, we also computed an alternative proxy of action-based manipulation, the cumulative abnormal turnover (CAT), which is defined in a manner similar to CAV except that the volume is scaled by the number of shares outstanding.

[31]We also examined a third window (-22, -250)[-250, -22]?, covering the entire year prior to the announcement date, to check the robustness of our specification, and find found that the results are were similar; hence, we do not report them here, to conserve space.

The cumulative abnormal volume (CAV) and cumulative abnormal return (CAR) are computed for all three windows described above. Panel A of Table IV reports univariate results of these three windows for CAR, and CAV. We find that CAR is positive for all the three windows is positive: CAR *(-22, -32)* and CAR *(-22, -250)* are both statistically significant. If price manipulation were rampant, one would expect to see negative $CARs$ in the period prior to the announcement date. However, it could also be argued that the $CARs$ could possibly have been even higher if it was not for price manipulation. In other words, price manipulation does not necessarily imply negative $CARs$, rather it could imply lower $CARs$ than otherwise. One cannot, therefore, rule out manipulation on the basis of positive $CARs$ in the period prior to the announcement period.[32] Panel B reports the correlation between CAR and CAV. As can be expected, there is some positive correlation between the same variables defined over different windows. However, the correlations are stronger only when there is significant overlap between the periods, i.e., the (-22, -154)[-154, -22]? and (-22, -250) windows.

Table V presents the results associated with the tests of Hypothesis Hypotheses H.6 and H.7. Essentially, these regressions extend the regression analysis of Table III by including the proxies of manipulation in Regression 3 of that table. Our first test (of Hypothesis H.6) is based on *market illiquidity* as a proxy for manipulation. The more illiquid the a stock is, the easier it would be to push the price downward,s even with a low trading volume. Hence, the greater the illiquidity, the greater is the ease of effective manipulation. Table V, Regression 1 (and all the remaining regressions in the table) show that announcement period returns are negatively related to the log of the Amihud measure of illiquidity. This result suggests that the aggressive preferential allotment policy, which reflects information asymmetry issues in our model, dominates the manipulation revelation effect. Overall, this evidence is consistent with the main thesis of our paper that information asymmetry is a key driver of the preferential allotment decision. This result also suggests that, for a one standard deviation change in the metric of illiquidity, the CAR is reduced by 0.11% percent.

Hypothesis H.7 discusses the key empirical tests related to the prior period price and volume based proxies of for the degree of manipulation based on the prior period's price and volume. It

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[32]However, it is always possible that information-based or action-based manipulation is taking place; it is conceivable that such manipulative strategies are not accompanied by abnormal volumes. Thus, a lack of abnormal volume is not sufficient evidence to preclude the occurrence of manipulation.

implies that announcement period returns should be positively related to the prior period's *CAR*, and negatively related to the prior period's *CAV*. In direct contrast, the manipulation revelation effect argues exactly the opposite: that announcement period returns should be negatively related to the prior period's *CAR* and positively related to the prior period's *CAV*.

Regressions 2-5 in Table V contain the manipulation variables *CAR (-22, -32), CAR (-22, -154), CAV (-22, -32), and CAV (-22, -154)*[should these be written CAR[-32,-22] etc?] .[33] These regressions show that the coefficients on the two *CAR* variables are positive and significant, although the *CAR(-22, -154)* variable is only marginally so. For instance, to understand the economic significance, the coefficient in Regression 2 implies that, for a one standard deviation change in the *CAR(-22, - 32)*, the contemporaneous *CAR* would increase by 2.42% percent. As with the illiquidity proxy of manipulation, these results are also consistent with the model's aggressive preferential allotment policy effect rather than the manipulation revelation effect. However, the two *CAV* variables do not have significant coefficients when added to the regression. One possibility is that manipulation may be based on avenues other than trade-based techniques, e.g., adverse information dissemination.

Interestingly, all the variables that were significantly related to announcement period returns (Table III) continue to retain their significance in Table V. These findings assure us that the conclusions drawn from Table III are robust to empirical specifications that account for manipulation. Overall, our results also suggest the presence of manipulation. At first glance, these findings seem to provide some degree of support for the Entrenchment Hypothesis, which states that managers indulge in self-dealing behavior. However, the empirical evidence should be viewed more in terms of market efficiency rather than managerial entrenchment. The evidence only suggests that the market environment permits manipulation, and is not a direct test of the Entrenchment Hypothesis. Rather, our results strongly suggest that manipulation is driven by information asymmetry issues, as captured in the model.

To summarize the conclusions of our empirical analysis, we find statistically significant support for the key empirical implications of the model presented in this paper. In particular, we find that the announcement period reaction to preferential allotments is positive (Hypothesis

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[33]We do not report results for the (-22, -250)[-250,-22]? window, since, due to the substantial overlap with the (-22, -154) window, they are fairly similar. Also, we do not report the results for the *CAT* proxies because they are qualitatively similar to the results obtained with the *CAV* proxies.

H.1), and the announcement period reaction is more positive for preferential allotments that follow come after a low price path (Hypothesis H.2). We find that announcement period returns are positively related to volatility (Hypothesis H.3) but we find mixed evidence about the relationship between announcement period reactions and the owner-managers' stake prior to the announcement (Hypothesis H.4). Announcement period returns are negatively related to leverage (Hypothesis H.5). Overall, the evidence in regarding H.1.-H.5 is largely supportive of the Undervaluation Hypothesis presented in the model. We also develop model-specific hypotheses on manipulation (Hypothesis Hypotheses H.6 and H.7) and find evidence in support of the possibility of the model's predicted information asymmetry- driven manipulative behavior. All our key findings are robust in the sense that they persist after we controlling for manipulation. Our analysis also sheds light on the Monitoring Hypothesis, the Certification Hypothesis and the Entrenchment Hypothesis that have been proposed in the existing literature on private placements. Results based on tests of Hypotheses H.8 and H.9 show little support for the Monitoring Hypothesis, the Certification Hypothesis or the Entrenchment Hypothesis in the context of the Indian capital markets.

5 Conclusion

The empirical literature on private placements of equity suggests that managerial entrenchment is perhaps the most important driver of the private placement decision. One would imagine that entrenchment would be of even greater concern for private placements made to owner-managers. Yet, the popularity of private placements to owner-managers, particularly in emerging markets, suggests that there is more to the story than just managerial entrenchment.

In this paper, we propose an extension of the Myers and Majluf (1984) model to show that preferential allotments to owner-managers can resolve the underinvestment problem. This result seems intuitive - there is no information asymmetry problem when insiders finance the equity issue, and therefore, there is unlikely to be no underinvestment. It is likely that owner-managers are critical sources of capital in emerging markets and the benefits of resolving the underinvestment problem may outweigh qualms about managerial self-dealing (in the form of a lower issue price), especially given the buffer provided by the regulatory restrictions on the pricing of preferential allotments. Further, when owner-managers are resource constrained, private equity players can help bridge the gap in funding and help resolve the underinvestment problem. It

should be emphasized, though, that private placements generally offer an alternative that is superior to rights offers for a wide range of outcomes of the private information signal. Indeed, we find evidence supporting our model in a sample of preferential allotments in the Indian market. Our results are robust to the possibility of manipulation and support the Undervaluation Hypothesis, which follows from an application of the Myers and Majluf (1984) model to a market environment that has distinctly different institutional arrangements from those typically found in developed markets. Our model could also be extended to examine the general problem of the optimal regulation of private placements.

Appendix 1: Proofs of Proposition 1 and Extensions

A.1.1 Proof of Proposition 1

Let N denote the number of original shares outstanding, n the number of new shares issued (either in the outside equity issue or in the preferential allotment), P the issue price, V_{0-} (P_{0-}) the pre-announcement market value (price per share) of the firm at date $\tau = 0^-$, and V_{0+} (P_{0+}) the post-announcement value (price per share) of the firm at date $\tau = 0^+$. Then, $P_{0-} = \frac{V_{0-}}{N}$ and $P_{0+} = \frac{V_{0+}}{(N+n)}$, where n new shares are issued at an issue price P to raise the capital (I) required to invest in the positive NPV investment opportunity.

The pre-announcement market value of the firm will be given by the sum the market value of the assets-in-place (AIP) and the NPV of the investment opportunity (IO), which is equal to $\frac{x+y}{2} - I$. On this date, the market's expectation of the hidden value (HV) is zero.[34] Since the expected value of the assets-in-place (AIP) is equal to $s/2$, it follows that $V_{0-}(s = h) = \frac{h}{2} + \frac{x+y}{2} - I$ and $V_{0-}(s = l) = \frac{l}{2} + \frac{x+y}{2} - I$. In general,

$$P_{0-}(s) = \frac{V_{0-}(s)}{N} = \frac{\frac{s}{2} + \frac{x+y}{2} - I}{N}, s = l, h \qquad (1)$$

[does this need to be numbered A.1?]

A.1.2 Fraction of shares "sold" in an outside equity issue

When n shares are issued at price P to raise a capital of I, $n = I/P$, and f, the fraction of the firm that has to be "sold", is given by

$$f(s) = \frac{n}{N+n} = \frac{\frac{I}{P}}{N + \frac{I}{P}} = \frac{I}{NP + I}, s = l, h \qquad (2)$$

[renumber as A.2?]

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[34]Note that $V_{0-}(s)$ should reflect the market's expectation of the Hidden hidden Value value (HV), conditional on the owner-managers's investment-financing policy. In equilibrium, it will be shown that owner-managers always invest in the positive NPV project under the conditions stated in Proposition 1. The financing policy of owner-managers is characterized by a cutoff signal value ($\hat{t}(s)$), such that for all signal values below 0 outside equity (OE) is employed, for all signal values in $(0, t^*(s))$ rights offerings are employed, and for all signal values greater than $t^*(s)$, preferential allotments (OM) are employed. Given that $\hat{t}(s)$ arises from a uniform distribution over $(-H, H)$, the market's expectation of the Hidden hidden Value value (HV) is equal to $(Prob(t < 0)(E(t|OE) + (Prob(0 \leq t < \hat{t}(s))(E(t|RO) + (Prob(t \geq \hat{t}(s))(E(t|OM)$. This implies that the market expectation of t conditional on the owner-managers' investment-financing policy is given by: $\frac{1}{2}\frac{(-H+0)}{2} + \frac{(\hat{t}*(s))}{2H}\frac{\hat{t}(s)}{2} + \frac{(H-\hat{t}(s))}{2H}\frac{(\hat{t}(s)+H)}{2} = 0$. Thus, in either case ($s = h$ or $s = l$), the market's expectation of the Hidden hidden Value value (HV) is equal to zero.

If capital is raised from outsiders (OE), the issue price, P, will be equal to $P_{0^-}(s)$. In a competitive market, outsiders would will be unwilling to pay anything more than $P_{0^-}(s)$. Since owner-managers would will want to issue shares to outsiders at the highest possible price, the issue price will be set at $P_{0^-}(s)$, and Equation 2 implies that

$$f^{OE}(s) = \frac{I}{NP_{0^-}(s) + I} = \frac{I}{\frac{s}{2} + \frac{x+y}{2}}, s = l, h \tag{3}$$

[renumber to A.3?] after using the result in Equation 1.[should this be eqn a.1?]

A.1.3 Fraction of shares "sold" in a preferential allotment

On the other hand, if n shares are issued in a preferential allotment, the issue price is not determined by a competitive process. If V_{-1} denotes the market value at time $\tau = -1$, the issue price will be constrained by the pricing formula as follows:

$$P \geq \frac{Max[V_{0^-}(s), \frac{V_{0^-}(s)+V_{-1}}{2}]}{N}, \tag{4}$$

[renumber to A.4?] Equation 4 states that the issue price should be greater than or equal to the higher of the current valuation, V_{0^-}, and the average price in the previous period (from time τ = -1 to $\tau = 0^-$). Since the owner-managers would prefer to issue shares (to themselves) at the lowest possible price, the inequality in Equation 4 will be binding. Note that V_{-1} is given as follows (after using the result in Equation 1): [is this Eqn 1 from the main text or eqn A.1?]

$$\begin{aligned} V_{-1} &= V_{0^-}(s = h)\pi(s = h) + V_{0^-}(s = l)\pi(s = l) \\ &= [\frac{h}{2} + \frac{x+y}{2} - I](\frac{1}{2}) + [\frac{l}{2} + \frac{x+y}{2} - I](\frac{1}{2}) \\ &= [\frac{h+l}{4} + \frac{x+y}{2} - I] \end{aligned} \tag{5}$$

It is easy to see that $V_{0^-}(s = l) < V_{-1} < V_{0^-}(s = h)$. When s=h, the average market value over the previous period will be lower than the current valuation. In this case, Equation 4[check numbering] implies that the issue price is equal to $\frac{V_{0^-}(s=h)}{N} = \frac{[\frac{h}{2}+\frac{x+y}{2}-I]}{N}$. Equation 4 implies that

$$f^{OM}(s = h) = \frac{I}{\frac{N[\frac{h}{2}+\frac{x+y}{2}-I]}{N} + I} = \frac{I}{\frac{h}{2} + \frac{x+y}{2}} \tag{6}$$

If $s = l$, Equation 4 implies that the issue price will be equal to the average price, which (after

using the result in Equation 5) is given by

$$P_{avg} = \frac{V_{0^-}(s=l) + V_{-1}}{2N} = (\frac{1}{2N})(\frac{l}{2} + \frac{x+y}{2} - I) + \frac{1}{2N}(\frac{h+l}{4} + \frac{x+y}{2} - I) = \frac{[\frac{h+3l}{8} + \frac{x+y}{2} - I]}{N} \quad (7)$$

Using this issue price in Equation 2, the fraction of shares issued in a preferential allotment will be given by

$$f^{OM}(s=l) = \frac{I}{\frac{N[\frac{h+3l}{8} + \frac{x+y}{2} - I]}{N} + I} = \frac{I}{\frac{h+3l}{8} + \frac{x+y}{2}} \quad (8)$$

In general, the fraction of shares "sold" in a preferential allotment is given by

$$f^{OM}(s) = \frac{I}{\frac{h+3s}{8} + \frac{x+y}{2}}, s = l, h \quad (9)$$

Note further that the SEBI-mandated issue price in a preferential allotment when $s = l$ is over-valued given the publicly available information. This overvaluation is given by the difference between V_{avg} and $V_{0^-}(s = l)$. Note that $V_{avg} = NP_{avg}$, where P_{avg} follows from Equation 7. Thus the SEBI regulation-s induced additional premium paid by buyers in a preferential allot-ment is given by

$$V_{avg} - V_{0^-}(s=l) = [\frac{h+3l}{8} + \frac{x+y}{2} - I] - [\frac{l}{2} + \frac{x+y}{2} - I] = \frac{(h-l)}{8} \quad (10)$$

A.1.4 Owner-managers' investment-financing decision

At date $\tau = 0^-$, the owner-managers (promoters) observe a private signal (t) of the hidden value. Let $W(t, s)$ denote the expectation (as of date $\tau = 0$) of the wealth of the owner-managers (promoters) on the liquidation date $\tau = +1$. The Ownerowner-managers have to choose among three alternatives: (i) No issue Issue (UI): no shares are issued if the project is rejected, (ii) Outside Equity (OE): shares are issued to outsiders, and (iii) Preferential Allotment (OM): shares are issued to owner-managers.

Case A (No Issue: UI)

The expected wealth of the owner-managers is given by the expected value of the assets-in-place (AIP), the expected hidden value (HV), and the expected cash flows on the investment

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opportunity. Since the project is not undertaken, its NPV is irrelevant in this alternative.

$$W^{UI}(t,s) = \alpha \left(\frac{s}{2} + \frac{t}{2} \right) \tag{11}$$

Case B (Outside Equity: OE)

The owner-managers issue a fraction, f^{OE}, to outsiders and their expected wealth is given by the expected value of the assets-in-place (AIP), the expected hidden value (HV), and the expected cash flows on the investment opportunity. Once the fraction, f^{OE}, of the firm is "sold", the original shareholders are left with the fraction, (1-f^{OE}), of the firm. The owner-managers are entitled to a fraction α of this remaining part. It follows that

$$W^{OE}(t,s) = \alpha(1 - f^{OE}(s)) \left(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2} \right) \tag{12}$$

Case C (Preferential allotmentAllotment: OM)

The owner-managers issue a fraction, $f^{OM}(s)$, to themselves. In return for this additional shareholding in the firm, the owner-managers have to supply the project's investment capital of I. Their original shareholding (α) entitles them to a fraction, $\alpha(1 - f^{OM}(s))$, of the total expected cash flows. In addition, they are also entitled to a fraction, $f^{OM}(s)$, of the firm's expected cash flows because of the new shares they have issued to themselves in the preferential allotment. Finally, the owner-managers supply the investment capital (I) and this shows up as a negative cash flow:

$$W^{OM}(t,s) = \left[\alpha(1 - f^{OM}(s)) + f^{OM}(s) \right] \left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2} \right] - I \tag{13}$$

Case D (Rights Offering: RO)

The wealth effect of a rights offering (for the owner-managers) is given by

$$W^{RO}(t,s) = \alpha(1 - f^{RO}(s))(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}) + \alpha f^{RO}(s)(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}) - \alpha I. \tag{14}$$

The first term represents the value of the residual claim of the owner-managers after the rights offering, the second term represents the owner-managers' gains from the present holdings obtained from the rights offering, and the third term represents the proportional investment made by the owner-managers in the rights offering. This expression simplifies asto

$$W^{RO}(t,s) = \alpha(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}) - \alpha I. \tag{15}$$

Note that the issue price in the rights offering is irrelevant because the net wealth gain of the owner-managers is independent of f^{RO}.

Comparing $W^{RO}(t,s)$ with the wealth effects from the other alternatives (OE, OM, and UI), we can derive the cutoff levels of the signal t that defines the regions where in which one financing alternative is favored over the the other. For instance, comparing $W^{RO}(s)$ with $W^{UI}(t,s) = \alpha\left(\frac{s}{2} + \frac{t}{2}\right)$, we get the result that the rights offering is always preferred to the "no investment alternative" (for all signals of t) as long as $\frac{1}{2}(x+y) > I$, i.e., so long as the project is a positive NPV project. Note that the intersections of the $W^{OE}(t,s)$, $W^{OM}(t,s)$ and $W^{UI}(t,s)$ lines lie below the x-axis and therefore, the critical points are determined by the intersections of the $W^{RO}(t,s)$, line with the $W^{OE}(t,s)$ with and $W^{OM}(t,s)$ lines.

Comparing $W^{RO}(t,s)$ with $W^{OM}(t,s) = \left[\alpha(1 - f^{OM}(s)) + f^{OM}(s)\right]\left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}\right] - I$ yields the result that the preferential allotment alternative, OM, dominates the rights offering alternative, RO, for all $t > \bar{t}(s) = \frac{h-s}{4}$. Finally, comparing $W^{RO}(t,s)$ with $W^{OE}(t,s) = \alpha(1 - f^{OE}(s))\left(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}\right)$, we can conclude that the rights offering alternative, RO, dominates the outside equity alternative, OE, for signals $t > 0$, for positive NPV projects.

Given the above cutoffs for rights offerings compared with the other alternatives, and the cutoffs between the outside equity, preferential allotment and no investment alternatives determined in the original analysis, we can see that outside equity dominates the other alternatives for all $t < 0$, the rights offering dominates the other alternatives for all $t \in (0, \frac{h-s}{4})$, and preferential allotment dominates the other alternatives for all $t > \frac{h-s}{4}$.

A.1.5   Proof of Corollary 1

Corollary 1 (ii) follows upon from differentiating the expression for $\hat{t}(s)$. Given that t is drawn from a uniform distribution over $(-H, H)$, it follows that the expectation of the hidden value (HV), conditional on a preferential allotment, is given by $\frac{\hat{t}(s)+H}{4}$. After substituting for $\hat{t}(s)$, we get an explicit expression for the announcement period effect stated in Equation 2[is this in the main text or the appendix? numbering of appendix equations needs to be changed to make it clear]. Corollary 1(iii) follows immediately upon from the differentiation of the announcement period return.

A.1.6 Manipulation Modelmodel

Manipulation in the model is captured by a spurious dip in the price level at $\tau = 0^-$ by an amount equal to w. This dip in price is assumed to arise because of strategic trading by the owner-managers in the period prior to the announcement date. Thus, prices at $\tau = 0^-$ would reflect the drop, w, in both the low price $(s = l)$ and the high price $(s = h)$ states of the world. The price is given by $V_{0^-}(s) = \frac{s}{2} + \frac{x+y}{2} - I - w$. Due to price manipulation, owner-managers will now be able to issue shares to themselves at a lower price. Note that the expressions for Equations 12-13 depend on f^{OE} and f^{OM}, as stated in Equations 3 and 9, respectively. These quantities change because of the dip in price by the amount w, as shown below.

$$f^{OE}(s) = \frac{I}{\frac{s}{2} + \frac{x+y}{2} - w} \tag{16}$$

$$f^{OM}(s) = \frac{I}{\frac{h+3s}{8} + \frac{x+y}{2} - w} \tag{17}$$

With the above modifications in $f^{OM}(s)$ and $f^{OE}(s)$, the cutoffs in a world of manipulation are determined in exactly the same way as before, namely, by comparing Equations 11-13 in a pairwise manner. The above equations follow from this comparison.

It should be noted that manipulation prior to the announcement date is best captured by assuming that investments in manipulation are made at $\tau = -1$ and the benefits of manipulation are realized at $\tau = 0$ when the price level drops by an amount equal to w. At time $\tau = -1$, owner-managers are unaware of the realization of the hidden value (t), which is revealed at time $\tau = 0^-$. *Ex-ante*, at $\tau = -1$, owner- managers have to invest in manipulation activities without knowing the realization of t. *Ex-post*, (at $\tau = 0^-$), they would have liked to have set $w = 0$ for low realizations of t (when they would be issuing outside equity) and the maximum feasible value of w for sufficiently high realizations of t (when they would be going for a preferential allotment). Given these *ex-post* incentives, the *ex-ante* chosen value of $w = w^*$ would will be some average of these two extreme situations. It can be determined by integrating the benefits of manipulation over all possible realizations of t and then maximizing the expression with respect to w, as shown in the equation below. The tradeoffs in this optimization exercise are obvious: Choosing a very high value of w would will hurt owner-managers whenever if they then observe a low realization of the hidden value (t) because it would will trigger an outside equity issue at a less than favorable price. The low issue price would will then benefit outsiders at the expense of insiders. On the

other hand, choosing a very low value of w could also hurt the owner-managers if insiders they then observed a high realization of t because it this would would trigger a preferential issue. Owner-managers would then end up purchasing shares at higher prices than otherwise (i.e., if they had invested more in manipulation activities). Choosing an intermediate level of w would will balance these tradeoffs (subject to the usual boundary conditions - in this case $w < l$ in order to ensure positive price levels.).

$$
\begin{aligned}
W(w^*) = \quad & Max_{[w]} \left\{ Prob(s=h) \left[\int_{-H}^{0} W^{OE}(t, s=h; w)dt + \int_{0}^{H} W^{OM}(t, s=h; w)dt \right] \right. \\
& + \left. Prob(s=l) \left[\int_{-H}^{\widehat{t}^{OE-OM}(s=l)} W^{OE}(t, s=l; w)dt + \int_{\widehat{t}^{OE-OM}(s=l)}^{H} W^{OM}(t, s=l; w)dt \right] \right\}
\end{aligned}
$$

$$(18)$$

A.1.7 Information Asymmetry asymmetry in both Assetsassets-in-place and Investment investment Opportunityopportunity

We now consider the standard Myers and Majluf (1984) setup where information asymmetry applies to both the assets-in-place a well asand the new project. Let the hidden value associated with the NPV of the project be q, which is drawn from a distribution with an expected value of 0. We assume that the manager will invest only in positive NPV projects. Equation 11 stays unchanged, but Equations 12 and 13 get are modified to the equations below:

$$
W^{OE}(t, s) = \alpha(1 - f^{OE}(s)) \left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2} + \frac{q}{2} \right] \tag{19}
$$

$$
W^{OM}(t, s) = \left[\alpha(1 - f^{OM}(s)) + f^{OM}(s) \right] \left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2} + \frac{q}{2} \right] - I \tag{20}
$$

Now, comparing Equation 19 with Equation 11 yields the following inequality, which has to be satisfied in order for the owner-managers to prefer an outside equity financing choice (OE) to the underinvestment choice (UI):

$$
q > \frac{f^{OE}(s)}{1 - f^{OE}(s)} t + \left[\frac{f^{OE}(s)}{1 - f^{OE}(s)} s - (x+y) \right] \tag{21}
$$

Note that the right hand side is a linear function of t with a positive slope and a negative intercept term, as shown in the figure below. This linear boundary defines the regions of (q, t)

where the owner-managers prefer going for an outside equity issue (*OE*) rather thanto under-investing in the project (*UI*) and vice versa.

Comparing Equation 11 with Equation 20, we can solve for the boundary that defines the regions of (*q, t*) where in which the owner-managers prefer the preferential allotment choice (*OM*) to the underinvestment choice (*UI*). The boundary is given by

$$q > \frac{1}{\alpha + f^{OM}(s)(1-\alpha)} \left(-f^{OM}(s)(1-\alpha)t + \left[2I - f^{OM}(s)(1-\alpha)s\right]\right) - (x+y) \qquad (22)$$

Again, the right hand side of Equation 22 is a linear function of *t*. However, both the slope and the intercept term are negative, as shown in the figure below. In a similar vein, we can compare Equation 19 with Equation 20 to determine the regions of (*q, t*) where in which the preferential allotment alternative (*OM*) is preferred to outside equity (*OE*). It can be shown that the boundary is defined by

$$q > -t + \left[\frac{2I}{\alpha(f^{OE}(s) - f^{OM}(s)) + f^{OM}(s)} - (s+x+y)\right] \qquad (23)$$

The right hand side of Inequality 23 is a linear function of *t*. It has a slope of -1 and an intercept term that is greater than 0 when $s = l$, but exactly equal to 0, when $s = h$. We assume, as before, that $NPV(IO) >= \frac{(1-\alpha)\frac{(h-s)}{4}(\frac{x+y}{2})}{s+x+y+\frac{(h-s)}{4}}$. This ensures that the threshold cutoff values are such that $\widehat{t}^{UI-OM}(s) < \widehat{t}^{OE-OM}(s) < \widehat{t}^{OE-UI}(s)$. These cutoff values represent the intersection points of the three lines with the *x*-axis.

Equations 21, 22 and 23 are mapped in the figure below. It is interesting to note that the three equations have a common intersection point. A little bit of algebra shows that the common intersection point has the coordinates, $q^* = t^* = 2[I - (x+y)/2]$, which is the negative of twice the NPV of the project.

Now let us consider the *RO* alternative. We would have three lines defining the dominance regions of *RO* versus *UI*, *RO* versus *OM*, and *RO* versus *OE*. Note that the only line of relevance is the *RO* versus *UI* line. This line tells us about (possibly new) regions where in which *UI* might dominate the other alternatives. The other two lines have no implications for underinvestment. It turns out that the *RO* versus *UI* line is parallel to the *x*-axis and intersects the *OE* versus *OM*, *OM* versus *UI*, and *OE* versus *UI* lines at the same point, with $q^* = t^* = -2NPV$!

The common intersection point will always lie below the dashed line $(q = I - (x+y)/2)$, which defines the lower bound of the information asymmetry on regarding the NPV of the project. (The lower bound ensures that the manager considers only positive NPV projects.) Thus, the underinvestment situation would will arise only in the area spanned by the curved arrow shown in the graph. In this region of (q,t), the manager would prefers the "No Issue" choice to all three alternatives: both the preferential allotment, the rights offering and the outside equity alternatives. As can be seen in the graph, the underinvestment region lies completely in the infeasible range of (q,t). It follows that the manager will always accept all positive NPV projects and there will be no underinvestment in such projects!

Figure A 1.1: Asymmetry of information and the firm's financing decision

This figure shows how the regions of (q,t) – the combinations of information asymmetry about the NPV of the project (q) and the information asymmetry about the assets-in-place (t) - affect the financing decision. The feasible region of (q,t) lies above the dashed line parallel to (and below) the x-axis. The underinvestment region lies in the infeasible range of (q,t). (To generate the graph, we assume, $x = 6$, $y = 4$, $I = 4$, implying that the NPV = 1. Further, we assume that $H = 5$, $h = 10$, $l = 6$, and = 0.25.)
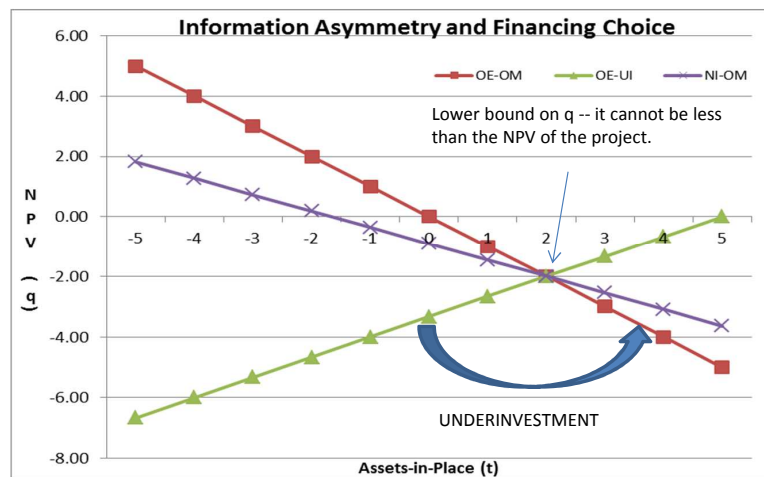
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Table I: Descriptive Statistics of Preferential Allotments of Equity in India

Firm- Level Variables	All firms Firms	Group- Affiliated firmsFirms	Stand-Alone firmsFirms	Difference (*t*-value)	Low Price Path	High Price Path	Difference (*t*-value)	Owner-Manager	Non Owner-Manager	Difference (*t*-value)
N	164	107	57		102	62		91	73	
Panel A: Firm Characteristics										
Market Capcap. (In in Rupees Crore)	1956.35	2554.89	853	1701.89(3.00)***	1758.69	2275.16	-516.47(-0.77)	2200	1646	554.66(0.77)
Illiquidity x 10^{-4} (% Returnreturn/Rupee Volumevolume)	6.18	3.52	11.10	-7.58(-3.70)***	6.72	5.32	1.41(0.66)	7.33	5.19	2.14(1.03)
Volatility (%)	4.01	4.05	3.94	0.106(0.38)	4.18	3.74	0.44 (1.63)	4.07	3.97	0.099(0.36)
Interest coverage ratio	6.03	2.10	15.13	-13.02(-3.19)***	7.26	3.99	3.26(0.22)	10.69	2.51	8.17(2.07)**
Debt-Equity equity ratio	0.93	1.01	0.78	0.22(0.48)	0.68	1.33	-0.648(-1.37)	0.47	1.13	-0.66(-1.46)
Panel B: Issue Characteristics										
Issue size to Ownerowner-Manager manager equity (%)	60.00	72.00	35.00	37.19(0.82)	77.90	31.45	46.44(1.07)	32.44	82.77	-50.00(-1.15)
Issue size to outstanding shares (%)	16.00	15.60	16.82	-1.21(-0.43)	17.25	14.01	3.24(1.18)	15.04	16.84	-1.80(-0.66)
Panel C: Investor Characteristics										
Owner-Manager's manager's subscription (%)	45.00	43.00	50.80	-7.80(0.19)	59.70	40.30	19.40(-2.07)			
Private Equity equity subscription (%)	44.70	49.50	35.20	14.30(2.10)**	65.00	35.00	30.00(0.30)			
Bank subscription (%)	10.30	7.50	14.00	-6.50(-0.71)	66.67	35.33	33.34(1.34)			
Panel D: Ownership Characteristics										
Owner-Manager's manager's equity (%)	42.39	40.68	46.03	-5.35(-1.45)	42.83	41.70	1.13(0.32)	44.92	41.79	3.12(0.93)

This table reports the summary statistics relating to 164 firms that issued preferential allotments (private placements) of equity in India during the years 2001-2009. The statistics for the full sample are reported in the first column. The other columns report statistics based on three sets of sub-samples. The first set of sub-samples divides the sample based on whether a firm is affiliated to a business group (Group- Affiliated firmsFirms) or not (Stand-Alone firmsFirms). The second set of sub-samples divides the sample based on whether the issue was made following after a low price path or a high price path. High Price Path (Low Price Path) represents the sub-sample of firms for which the average of the high and low daily closing prices in the two-week period prior to the announcement date is was higher (lower) than the average of the weekly high and low average price in the six months prior to the announcement date. The third set of sub-samples divides the total sample based on whether the owner-manager subscribed to the issue or not. The statistics for each set of sub-samples are followed by their respective mean differences along with *t*-values in parentheses. *Market Capcap* represents the average market capitalization at the time of the issue. The amount is reported in crore of Indian Rupees. One US dollar is approximately 45 Indian rupees Rupees and one crore is equal to 10 million. *Illiquidity* is the average ratio of the daily absolute return to rupee Rupee volume for a the period between from 10 days to 240 days to 10 days before the announcement date. *Volatility* is the (non-annualized) standard deviation of daily returns for a the period between 10 days tofrom 240 days to 10 days before the announcement date. *Interest coverage ratio* is the ratio of earnings before interest and taxes to interest expenses. *Debt-Equity equity ratio* is the ratio of total borrowing to net worth. All these variables are winsorized at the 1% level. ***, **, and * represent significance at the 1%, 5%, and 10% levels respectively.

Table II: Announcement Effects of Preferential Allotments of Equity in India

	Panel A: Overall Announcement Effects					
	All					
CAR (-1,+1) (%)	0.87(1.73)					
CAR (-5,+5) (%)	3.48(3.77)***					
CAR (-10,+10) (%)	6.18(4.19)***					

	Panel B: Announcement Effects Based on the Formula Price					
	Low Price Path	High Price Path	Difference(t-value)			
CAR (-1,+1) (%)	1.53(2.39)**	-0.20(-0.25)	-1.73(-1.69)			
CAR (-5,+5) (%)	4.54(3.59)***	1.79(1.40)	-2.75(-1.53)			
CAR (-10,+10) (%)	9.06(4.58)***	1.58(0.77)	-7.47(-2.62)**			

	Panel C: Announcement Effects based on the level Level of Volatility					
	Below Median	Above Median	Difference(t-value)			
CAR (-1,+1) (%)	0.29(0.49)	1.88(2.2)**	1.60(1.50)			
CAR (-5,+5) (%)	2.70(2.33)**	4.20(2.98)***	1.50(0.83)			
CAR (-10,+10) (%)	6.70(2.2)**	6.08(3.86)***	-0.61(-0.23)			

	Panel D: Announcement Effects based On on Ownership levelLevel					
	Below Median	Above Median	Difference(t-value)			
CAR (-1,+1) (%)	1.08(1.53)	0.63(0.87)	-0.45(-0.44)			
CAR (-5,+5) (%)	2.81(2.48)**	4.23(2.83)***	1.42(0.76)			
CAR (-10,+10) (%)	5.45(2.71)***	7.0(3.21)***	1.55(0.52)			

	Panel E: Announcement Effects based on the Interest Coverage Ratio					
	Below Median	Above Median	Difference(t-value)			
CAR (-1,+1) (%)	0.80(0.69)	1.10(1.90)	0.30(1.50)			
CAR (-5,+5) (%)	2.74(2.98)***	3.92(2.33)**	1.18(0.64)			
CAR (-10,+10) (%)	7.03(2.20)**	5.11(3.86)***	-1.92(-0.66)			

	Panel F: Announcement Effects based on the Issuer Type					
	Stand-Alone Firms	Group Firms	Difference(t-value)			
CAR (-1,+1) (%)	1.90(2.2)**	0.30(0.49)	-1.60(-1.50)			
CAR (-5,+5) (%)	4.31(2.33)**	3.02(2.98)***	-1.29(-0.61)			
CAR (-10,+10) (%)	10.87(3.86)***	3.61(2.20)**	-7.27(-2.23)**			

	Panel G: Announcement Effects based on the Investor Type					
	Owner-Managers(OM)	Private Equity Firms(PE)	Banks(B)	(PE-OM)	(B-OM)	(B-PE)
CAR (-1,+1) (%)	0.93(1.31)	0.49(0.65)	1.61(1.13)	-0.44(-0.43)	0.68(0.43)	1.12(0.70)
CAR (-5,+5) (%)	4.20(3.29)***	2.10(1.37)	3.24(1.35)	-2.10(-1.05)	-0.96(-0.35)	1.14(0.40)
CAR (-10,+10) (%)	7.82(3.71)***	4.50(2.10)**	1.25(0.33)	-3.30(-1.11)	-6.58(-1.50)	-3.25(-0.74)

This table reports the cumulative average abnormal return (*CAR*) around the announcement date for 164 private placements that occurred in India during 2001-2009. Abnormal returns are based on the market model (on the BSE100 Index) over the period (-31,-240)[-240,-21]?. *CAR's* are calculated for three windows, namely, (-1, to +1), (-5, to +5), and (-10, to +10)[square brackets?]. Panel A presents the statistics for the full sample. Panel B reports the *CAR's* based on whether the preferential allotment follows occurs after a low price path or a high price path. *High Price Path (Low Price Path)* represents the sub-sample of firms for which the average of the high and low daily closing prices in the two-week period prior to the announcement date is higher (lower) than the average of the weekly high and low average prices in the six months prior to the announcement date. Panel C reports results based on whether volatility, as measured by the standard deviation of daily returns over the period (-10, -240)[-240, -10]?, is above or below the sample median volatility. Panel D reports results based on whether the *owner-managers' ownership* prior to the announcement is above or below the sample median ownership level. Panel E reports results based on whether a firm's *interest coverage ratio* is above or below the sample median interest coverage ratio. Interest coverage ratio is the ratio of earnings before interest and taxes to interest expenses. Panel F reports results based on whether a firm is affiliated to a business group (Group- Affiliated firmsFirms) or not (Stand- Alone firmsFirms). Panel G reports results based on whether the investor is the owner-manager, or a bank or a private equity firm. Each panel has shows the corresponding mean differences along with their *t*-values.

Table III: Determinants of Announcements Effects of Preferential Allotments of Equity in India

Variable Name	Regression 1	Regression 2	Regression 3	
Dependent Variable: CAR(-10,+10)				
	All firms	All firms	All firms	Low Form Pric
N	162	162	162	
Intercept	19.81(3.21)***	17.94(2.50)***	17.95(2.49)***	
Panel A: Firm Characteristics				
ln(Market market Capcap)	-2.11(-2.26)**	-1.66(-1.61)	-1.42(-1.34)	
Group dummy	-2.34(-0.75)	-3.08(-0.97)	-3.61(-1.10)	
Volatility(%)	18.50(2.83)***	18.36(2.76)***	18.08(2.71)***	
Interest coverage ratio	0.009(0.41)	0.010(2.48)***	0.001(2.35)**	
Panel B: Issue Characteristics				
Issue size to Ownerowner-Manager manager equity (%)		0.001(0.23)	0.002(0.46)	
Issue size to outstanding shares (%)		0.080(0.96)	0.083(0.98)	
Instrument type dummy		1.301(0.38)	0.660(0.19)	
High Price price Path path dummy		-5.65(-1.95)**	-5.78(-1.99)**	
Panel C: Investor Characteristics				
Owner-Manager manager dummy			−	
Private Equity equity dummy			-1.87(-0.51)	
Banks dummy			-4.81(-1.01)	
Panel D: Ownership Characteristics				
Owner-Manager's manager's Equity equity				
Year dummies	Yes	Yes	Yes	
Industry dummies	Yes	Yes	Yes	
Adj. R-squared(%)	13.01	14.49	13.95	
p-value > F	0.000	0.000	0.000	

This table reports regression results for 162 private placements in India during 2001-2009. The dependent variable is the cumulative abnormal return for the -10 to +10 days window (*CAR (-10, +10)*) around the announcement date. Abnormal returns are based on the market model (on the BSE100 Index) over the period (*-31,-240*)[-240, -31]?. *High Price price Path path (Low Price price Pathpath)* represents firms for which the average of the high and low daily closing prices in the two-week period prior to the announcement date is higher (lower) than the average of the weekly high and low average prices in the six months prior to the announcement date. *Ln(Market market cap)* represents the natural log of the market capitalization of the firm. *Group dummy* takes the value 1 (0) if the firm is affiliated to an Indian business group (Stand stand-Alone alone firm). *Volatility* is measured as the standard deviation of daily returns over the period (*-10,-240*)[-240, -10]. *Interest coverage ratio* is measured as the ratio of earnings before interest and taxes to interest expenses. *Issue size to Ownerowner-Manager's manager's equity* is the ratio of the number of shares issued through preferential allotment divided by the number of owner-manager shares. *Issue size to outstanding shares* refers to the number of shares issued through preferential allotment to the number of outstanding shares. *Instrument type dummy* takes the value 1 (0) if the issue is made as plain equity (equity with warrants or convertibles). *Private Equity equity dummy* takes the value 1 if the investor is a private equity firm, else otherwise it is 0. *Bank dummy* takes the value 1 if the buyer of the equity is a bank, else otherwise it is 0. *Owner-Manager's manager's equity* represents the percentage of equity held by the owner-managers of the firm. *Year dummies* are for years (one less[I dont know what this means do you mean that one year is used as

the reference?]) between 2001 to 2009. *Industry dummies* are based on 3three-digit industry codes. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Table IV: Summary Statistics of Cumulative Abnormal Returns and Volume in Pre-Announcement Period

Panel A: Prior Period's Abnormal Returns and Volume							
Event Windows	Mean	t-value	Median	Event Windows	Mean	t-value	Median
CAR (-22,-32)	5.13	1.35	2.66**	CAV (-22,-32)	2783781	1.40	172445
CAR (-22,-154)	37.39	10.18***	32.24	CAV (-22,-154)	2366700	2.25**	1323750
CAR (-22,-250)	52.01	14.02***	47.17	CAV (-22,-250)	2468467	2.66	1108527

Panel B: Correlation Analysis						
	CAR(-22,-32)	CAR(-22,-154)	CAR(-22,-250)	CAV(-22,-32)	CAV(-22,-154)	CAV(-22,-250)
CAR(-22,-32)	1					
CAR(-22,-154)	0.3365	1				
CAR(-22,-250)	0.2924	0.7451	1			
CAV(-22,-32)	0.2369	0.1288	0.093	1		
CAV(-22,-154)	0.0425	0.0742	0.1019	0.6623	1	
CAV(-22,-250)	0.0072	0.0419	0.0962	0.5152	0.9721	1

This table reports the Cumulative Abnormal Return (*CAR*) and Cumulative Abnormal Volume (*CAV*) for a sample that comprises of 164 firms that raised equity in India through preferential allotments during 2001-2009. Panel A reports the *CAR* and *CAV* for three specific windows before the announcement date of the preferential allotments. In order to calculate the abnormal return, we estimate the expected return using the market model between the 240 to and 31 days before the announcement date. We use the BSE100 index as the benchmark for the Indian market return. Abnormal volume is the difference between the actual volume and the expected volume of a given stock. Volume is measured as the number of shares traded on a given day. Expected volume is calculated by regressing the daily stock volume on the daily market volume using four years' of daily data starting from day -300 and going backwards. We use the top 1000 stocks of the Bombay Stock Exchange for to calculating calculate the daily average market volume. The same procedure is applied, however, for different windows for *CAR(-22,-32),CAR(-22,-154), CAR(-22,-250), CAV(-22,-32), CAV(-22,-154)* and *CAV(-22,-250)*. We report the *t*-values and the median in the next two columns. Panel B reports the correlations of the CAR's and CAV's for the three specific windows. ***, **, and * represent significance at the 1%, 5%, and 10% levels respectively.

Table V: Determinants of Announcement Effects of Preferential Allotments of Equity in India in the Presence of Manipulation

	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5
Dependent Variable: *CAR(-10,+10)*					
N	162	162	162	162	162
Intercept	27.02(2.71)***	25.05(2.46)***	22.63(1.95)**	27.51(2.73)***	27.10(2.70)***
Panel A: Firm Characteristics					
ln(Market market cap)	-0.12(-0.10)	-0.37(-0.29)	-0.35(-0.27)	-0.12(-0.10)	-0.10(-0.08)
Group dummy	-6.67(-1.20)	-6.74(-1.26)	-5.94(-0.95)	-6.82(-1.23)	-6.71(-1.20)
Volatility	10.72(2.62)***	12.28(2.87)***	11.90(2.80)***	10.55(2.59)***	10.71(2.61)***
Interest coverage ratio	0.001(1.98)**	0.001(1.91)**	0.001(1.90)**	0.001(1.98)**	0.001(1.98)**
Panel B: Issue Characteristics					
Issue size to Ownerowner-Manager manager equity	0.003(0.56)	0.003(0.74)	0.002(0.42)	0.002(0.55)	0.002(0.55)
Issue size to outstanding shares	0.056(0.68)	0.027(0.34)	0.020(0.24)	0.057(0.70)	0.056(0.68)
Instrument type dummy	0.29(0.18)	0.48(1.25)	0.64(1.01)	0.37(1.20)	0.27(1.17)
High Price price Path path dummy	-6.11(-2.15)**	-6.75(-2.40)**	-7.83(-2.62)***	-6.41(-2.20)**	-6.27(-2.17)**
Panel C: Purchaser Characteristics					
Owner-Manager manager dummy	-	-	-	-	-
Private equity dummy	-0.15(-0.05)	-0.78(-0.25)	-0.52(-0.16)	-1.16(-0.05)	-0.001(0.00)
Banks dummy	-5.48(-1.19)	-5.28(-1.17)	-4.01(-0.86)	-5.43(-1.18)	-5.40(-1.17)
Panel D: Manipulation Environment					
Lnln(Illiquidityilliquidity)	-1.36(-2.14)**	-1.37(-2.19)**	-0.88(-1.99)**	-1.39(-2.81)***	-1.35(-2.13)**
Panel E: Prior Period's Abnormal Returns and Volume					
CAR(-22,-32)		0.21(2.30)**			
CAR(-22,-154)			0.006(1.73)*		
CAV(-22,-32)				0.000(0.49)	
CAV(-22,-154)					0.000(0.33)
Year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Adj. R-squared (%)	14.93	17.51	16.14	14.45	14.38
p-value>F	0.000	0.000	0.000	0.000	0.000

This table reports regression results for 162 private placements in India during 2001-2009. The dependent variable is the cumulative abnormal return for the -10 to +10 days window (*CAR (-10, +10)*) around the announcement date. Abnormal returns are based on the market model (on the BSE100 Index) over the period (*-31,-240*)[-240,-21]?. *High Price price Path path (Low Price price Pathpath)* represents firms for which the average of the high and low daily closing prices in the two-week period prior to the announcement date is higher (lower) than the average of the weekly high and low average prices in the six months prior to the announcement date. *Ln(Market market cap)* represents the natural log of the market capitalization of the firm. *Group dummy* takes the value 1 (0) if the firm is affiliated to an Indian business group (Stand stand-aAlone firm). *Volatility* is measured as the standard deviation of daily returns over the period (*-10,-240*)[-240,-10]?. *Interest coverage ratio* is measured as the ratio of earnings before interest and taxes to interest expenses. *Issue size to Ownerowner-Manager's manager's equity* is the ratio of the number of shares issued through preferential allotment divided by the number of owner-manager shares. *Issue size to outstanding shares* refers to the number of shares issued through preferential allotment to the number of outstanding shares. *Instrument type dummy* takes the value 1 (0) if the issue is made as plain equity (equity with warrants or convertibles). *Private Equity equity dummy* takes the value 1 if the investor is a private equity firm, else it isand 0 otherwise. *Bank dummy* takes the value 1 if the buyer of the equity is a bank, else it isand 0 otherwise. *Owner-Manager's manager's equity* represents the percentage of equity held by the owner-managers of the firm. *Ln(Illiquidityilliquidity)* is the natural logarithm value of the average ratio of daily absolute return to rupee Rupee volume over the period *-10,-240*))[-240,-10]?. *CAR(-22,-32)*,*CAR(-22,-154)*, *CAV(-22,-32)*, and *CAV(-22,-154)*[lower number should come first?] are the cumulative abnormal returns and cumulative abnormal volumes for the two-week and six-month windows prior to the announcement date. *Year dummies* are for the years (one less[see previous table]) between 2001 to 2009. *Industry dummies* are based on 3three-digit industry codes. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.
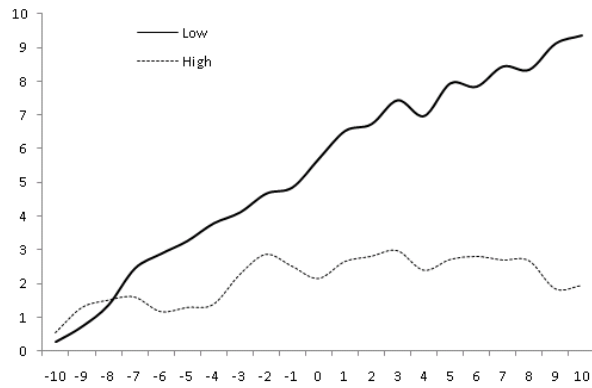
Figure 7: Cumulative average abnormal returns (CAARs) based on price path dynamics. The sample comprises of 164 firms that raised equity through preferential allotment during 2001-2009. In order to calculate the abnormal return, we estimate the expected return using the market model between from -240 to -31 days before the announcement date. We use the BSE100 index as the benchmark for the Indian market return. The figure reports the number of days before and after the announcement date on the x-axis and the percentage of cumulative average abnormal return (CAAR) on the y-axis. The figure has two graphs to represent CAARs for "low" versus "high" issue prices. "High" price Price ("Low" Price) refers to those firms where for which the last two weeks' average high and low[do you mean average of the high and low prices?] daily closing prices is was higher (lower) than the last six months' weekly high and low average price.
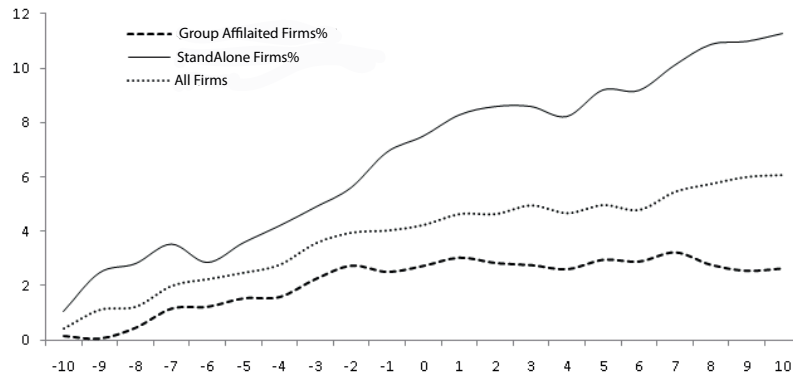

Figure 8: Cumulative average abnormal returns (CAARs) based on firm affiliation. The sample comprises of 164 firms that raised equity through preferential allotment during 2001-2009. In order to calculate the abnormal return, we estimate the expected return using the market model between from -240 to -31 days before the announcement date. We use the BSE100 index as the benchmark for the Indian market return. The figure reports the number of days before and after the announcement date on the x-axis and the percentage of cumulative average abnormal return (CAAR) on the y-axis. The figure has three graphs to represent CAARs for preferential allotments made to all firms, Group group-aAffiliated firms (Indian business groups) and Stand stand-aAlone firms.
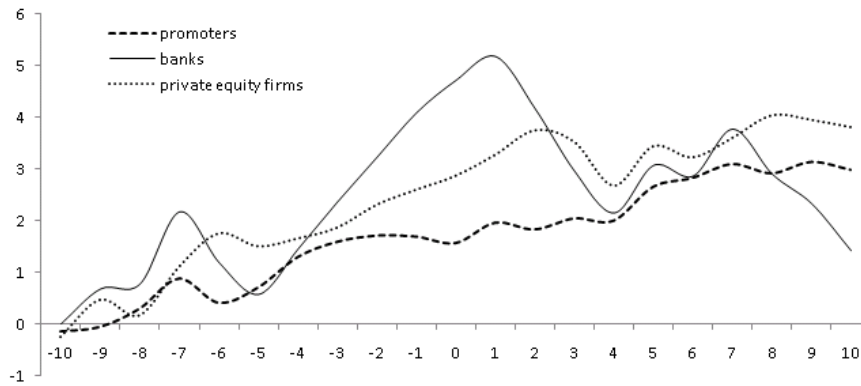
Figure 9: Cumulative average abnormal returns (CAARs) based on purchaser type. The sample comprises of 164 firms that raised equity through preferential allotment during 2001-2009. In order to calculate the abnormal return, we estimate the expected return using the market model between from -240 to -31 days before the announcement date. We use the BSE100 index as the benchmark for the Indian market return. The figure reports the number of days before and after the announcement date on the x-axis and the percentage of cumulative average abnormal return (CAAR) on the y-axis. The figure has three graphs to represent CAARs for three types of buyers of preferential equity, namely, promoters, banks, and private equity firms respectively.