Private Placements and Wealth Constraints of Owner-Managers

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Abstract

We present an asymmetric information model of private placements of equity to owner-managers and institutional investors. The investment-financing decision depends on the interaction between asymmetric information held by owner-managers and their wealth constraints. Our model shows that such private placements can mitigate, if not entirely eliminate, the underinvestment problem. Using a sample of 1064 preferential allotments issued in the Indian capital markets during 2001-2017, we find that announcement period returns are (1) positive, (2) higher for pure owner-manager preferential allotments, (3) unrelated to pre-announcement insider ownership, (4) negatively related to market capitalization, (5) negatively related to volatility of returns and (6) dependent on regulatory constraints that determine the issue price.

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1 Introduction

Preferential allotment of equity shares is a commonly used financing mechanism in the Indian capital markets. This arrangement typically occurs in the form of issues to a firm's owner-managers, but such allotments can also be made to institutional players, banks and other financial institutions.

In principle, a preferential allotment is a form of private placement of equity. However, since the corporate governance context in India differs significantly from that in developed countries, it merits special attention. In emerging markets like India, many businesses are family-controlled and there is a significant overlap between a firm's management and its owners.[1] Business families in India typically retain substantial stakes in the companies under their control and often provide capital for new projects/companies. As a consequence, preferential allotments are frequently made to owner-managers; thus, they are initiated by owners and also subscribed to by them, a situation that is rife with conflicts of interest. For instance, owner-managers can issue equity shares to themselves during times of market undervaluation or much worse, deliberately manipulate their share prices downward in order to issue shares to themselves at low prices. Although the potential for such managerial self-dealing has been generally recognized, the degree to which it can occur in family-controlled firms is much more significant, which has largely been ignored, in the private placement literature, so far.

Despite the negative externality of managerial self-dealing, regulatory authorities have largely encouraged the growth of the preferential allotment market, mainly because business families are important sources of new capital in emerging economies. Hence, other than placing a restriction on the permissible issue price in a preferential allotment, there is generally no regulation prohibiting preferential allotments to owner-managers. In fact, the market for preferential allotments has grown significantly over the last few decades.

The regulatory kid-glove treatment afforded to preferential allotments seems to be driven by weighing the trade-off in favor of a continuous supply of financial resources against the negative externality of owner-managerial self-dealing. We analyze this tradeoff in depth by presenting an asymmetric information model to explain the prevalence of preferential allotments. Our

[1]Family businesses tend to retain managerial control in India, because the judicial process is fraught with delay, and the enforcement of legal rights is lax, as in many other emerging markets. Merging the roles of ownership and management is a key device to avoid the agency problem created by separation of ownership and management.

paper contrasts with Myers and Majluf (1984) and subsequent papers in the literature, which rule out the possibility of managers subscribing to their own firm's equity issues. This assumption is reasonable in markets where (the lack of) managerial wealth and (or) managerial risk aversion constrain managers from participating in equity issues (an exception being management buy-outs). However, in countries like India, 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 in their business group, which allows them to participate in subsequent equity offerings.

Our model, therefore, analyses financing decisions made by managers and has broad relevance in many countries, particularly in the emerging economies. By allowing owner-managers to face varying wealth constraints, we include the Myers and Majluf (1984) model, which explicitly precludes the possibility of managers participating in equity issues, as a corner case of extreme wealth constraints faced by the owner-manager. Our model is applicable to any market where owner-managers have the choice of issuing equity to themselves in the presence of regulatory constraints. In summary, by including a third alternative of issuing equity to owner-managers in the form of preferential allotments (and rights offerings), in addition to the conventional choice between using internal resources and seeking outside financing, we generalize the Myers and Majluf (1984) model.

Our model is built around two key features: (i) information asymmetry between outsiders and insiders regarding the hidden value in a firm and (ii) wealth constraints faced by owner-managers. We show that the optimal investment-financing decision of firms then depends on the interaction between information asymmetry and wealth constraints faced by owner-managers, after accounting for regulatory constraints imposed on the issue price in a preferential allotment. In the case of negative signals about hidden value, owner-managers issue equity to outsiders, just as in the Myers-Majluf model. However, unlike the Myers-Majluf model in which the firms underinvests for sufficiently strong signals of value, owner-managers in our model opt for a preferential allotment of equity to themselves. This finding is intuitively along expected lines; when the signal is good, owner-managers can internalize the hidden value by issuing shares to themselves. However, this result get overturned when owner-managers face severe wealth constraints - they would rather underinvest, just as in the Myers Majluf model. Thus wealth constraints play the role of making underinvestment more likely. Things are more nuanced for weak and intermediate signals of hidden value. For interme-

diate levels of the signal, a preferential allotment is always optimal, independent of owner-manager's wealth constraints. Finally, in case of weak signals, the owner-manager's choice between a preferential allotment, a rights offering and an outside equity issue depends on the interaction between the severity of the owner-manager's wealth constraints and the regulatory constraints on the issue price in a preferential allotment. Thus, the key contribution of our model is that it *simultaneously* determines the investment/under investment choice, and conditional on investing, the funding choice between outside equity issues, rights offerings, private placements to owner-managers (and/or institutional players) in the context of wealth constraints and regulatory constraints on the issue price. These results can be seen as a generalization of the Myers and Majluf model to the situation where insiders are allowed to finance the firm but are also subject to regulatory constraints.

An important implication arising out of our model is that, if owner-managers do not face severe wealth 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. Owner-managers have incentives to manipulate share prices to lower levels prior to issuing shares to themselves. Therefore, financial market regulators permit insider equity financing only after imposing regulations on the issue price (of the private placement) to counter these incentives. Thus, any empirical examination of our model will necessarily have to account for the nuances of the regulatory constraints imposed on private placements. Keeping this issue in mind, our model explicitly incorporates typical regulatory pricing rules in developing clear and testable implications.

We confirm the predictions of the model by conducting an empirical analysis of 1,064 preferential allotments issued in the Indian capital markets during 2001-2018. We find that announcement period returns for preferential allotments are (1) positive, (2) higher for pure owner-manager preferential allotments, (3) negatively related to market capitalization, (4) negatively related to volatility, (5) unrelated to pre-announcement insider ownership and (6) dependent on regulatory constraints that determine the issue price. Our findings are robust to the effects of manipulation of pre-placement stock prices, which would depress the placement price to the advantage of owner-managers but to the detriment of other shareholders.

Our work is related to the work of Hertzel and Smith (1993) who also deal with the role of information asymmetry in explaining private placements.

Their model mainly addresses the certification role played by institutional investors in private placements, whereas our model is designed for private placements to owner-managers and/or institutional investors. Certification, clearly, has no role to play in preferential allotments made solely to owner-managers; thus our model addresses asymmetric information issues in the context of a larger group of potential investors that includes owner-managers, and our analysis is relevant for emerging markets where family-owned and family-financed businesses play a significant role in the economy. In contrast to the Hertzel and Smith (1993) *Certification Hypothesis*, the predictions in 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." Our empirical analysis distinguishes between the Certification Hypothesis and the Undervaluation Hypotheses, thereby allowing us the infer the empirical validation and relevance of our model.[2]

Our paper is also related to the extant empirical literature on private placements. Firstly, Wruck (1989) suggests that private placements are used to attract active shareholders who provide monitoring benefits (*Monitoring Hypothesis*), thereby leading to positive announcement returns.[3]. 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.

The empirical evidence presented in this study is largely supportive of the Undervaluation Hypothesis of our model. Our findings are robust in the sense that they persist after controlling for price manipulation (which, per se, can cause positive announcement returns when the market realizes that managers might have manipulated price downward before the announcement). Our analysis also sheds light on the Monitoring, Certification and Entrenchment

[2]Gomes and Phillips (2012) show that asymmetric information plays a major role in the choice of security type within public and private markets and in the choice of market in which to issue securities.

[3]Wruck and Wu (2009) find that the pre-placement relationship with investors matters in private placements. They find that new relationships can be used to improve corporate governance, leading to positive abnormal returns

Hypotheses that have been proposed in the existing literature on private placements. Overall, the results show more support for the Undervaluation 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 emerging markets. 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 in the U.S. and Europe, the focus of many of the prior studies. Overall, our empirical evidence corroborates the Myers and Majluf (1984) framework, after accounting for the competing motivations of private placements.

The paper is organized into five sections. A brief background on the regulation of preferential allotments in India is presented in Section 2. Section 3 presents our theoretical model and the corresponding empirical implications and testable predictions that follow from the model. Section 4 describes the data and certain methodological issues, and also presents the results of the empirical analysis. Section 5 concludes.

2 Preferential Allotments 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 provides essential background that helps to present the salient features of our theoretical model. The Indian capital market is regulated by SEBI. In India, preferential allotments of listed companies - often referred to as *preferential issues* or *preferential allotments* - are quite popular. It should be emphasized that not all preferential allotments are made to owner-managers (or promoters, as they are known in local parlance).[4] (Henceforth, we will use the terms preferential allotment and private placement interchangeably.) Preferential allotments are also made to institutional players,including private equity firms, banks and other financial institutions. However, all preferential allotments are subject to SEBI's pricing regulations, which are described below.

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

2.1 Pricing of Preferential Issues

The pricing of preferential equity issues in India is governed by the following regulations, with the relevant phrases italicized:[5] "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 (a volume weighted average price) 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 Extra Ordinary General Meeting (EGM) of shareholders is held to seek their approval for the preferential allotment.

Figure 1 illustrates the SEBI pricing rule. For the purposes of illustration, the price histories of two firms, Reliance Infra and HEG, have been 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. Since SEBI rules force the firm to issue new equity at a price greater than (or equal to) the higher of these two prices, the issue price is determined by 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. In general, if prices are declining, the (lower bound on the) issue price is determined by the historical six-month average price, and if prices are increasing, the (lower bound on the) issue price is determined by the more recent two-week average price. This arrangement ostensibly protects minority shareholders from managerial self-dealing (by manipulating the share price just prior to the preferential issue). Since declining price trends could arise due to manipulation, SEBI imposes the constraint that the issue price should be equal to the historical six-month average (under declining price trends). The logic behind this regulatory constraint is that it would be difficult for anyone to manipulate prices continuously over a six-month window. 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' welfare.[6]

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

[6]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 insiders for short-term gains based on privileged information. SEBI's norms require the issuer to provide the following in-

This figure is 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 x-axis and the corresponding daily prices for those days on the y-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-month 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.

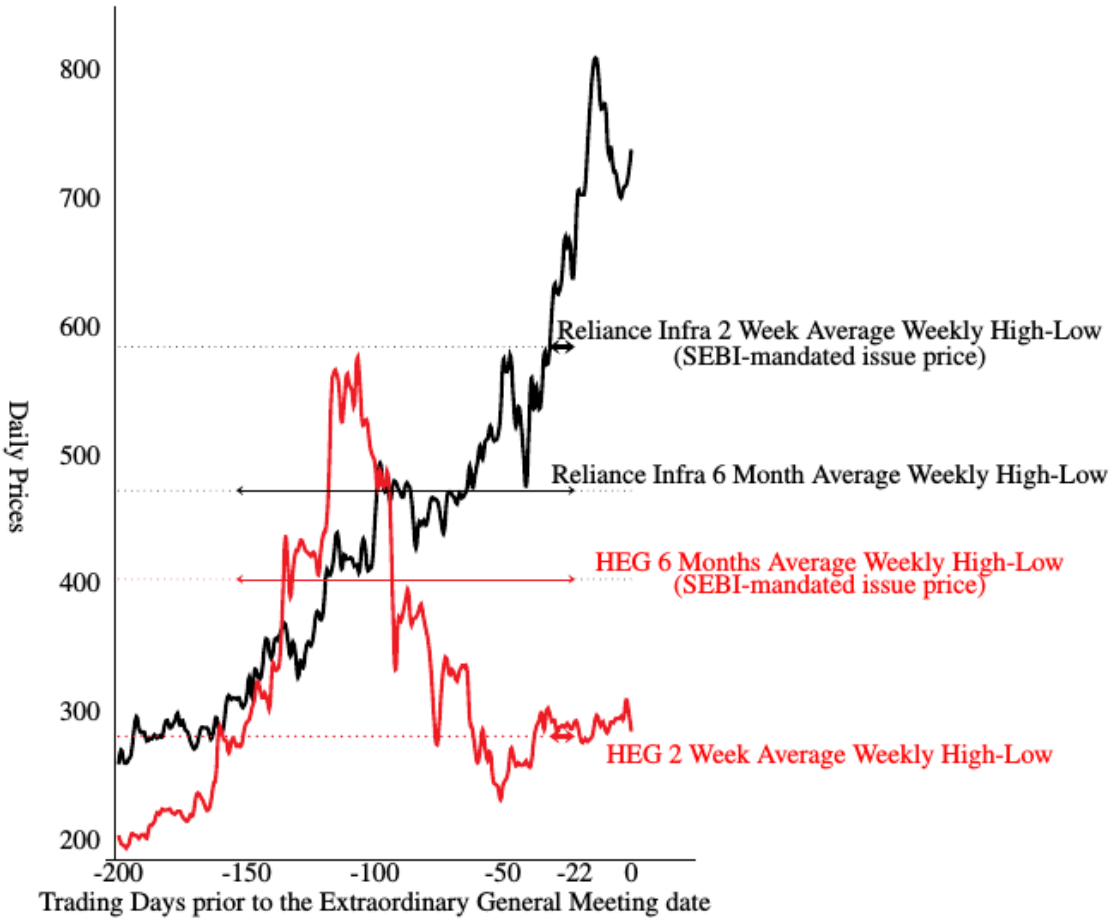

Figure 1: **SEBI regulations on the issue price in a preferential allotment**

formation to the stock exchange: (i) the objective of the preferential allotment, (ii) the intention of the promoters and other related parties to subscribe for the offer, (iii) the

3 Model and Testable Implications

We develop a variation of the Myers and Majluf (1984) model for analyzing preferential allotments. 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. By assumption, 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), or in the form of a rights offering (we refer to this alternative as RO), or in the form of a preferential allotment (PA). These preferential allotments can be made to: (i) owner-managers (pure owner-manager preferential allotments), (ii) a set of large sophisticated institutional investors (pure institutional investor preferential allotments), or (iii) a combination of owner-managers and institutional investors (joint preferential allotments). Institutional investors could be mutual funds, private equity funds, banks, insurance companies, etc.[7] The firm also has the choice of rejecting the positive NPV project, thereby underinvesting (we refer to this situation as UI for "Underinvestment"). Similar to the Myers and Majluf setup, we only consider equity capital as a new financing choice, under the assumption that the capital structure choice has already been made.

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.

shareholding pattern before and after the offer, (iv) the proposed time within which the allotment will be completed, and (v) the identification of the new shareholders and the percentage of post-preferential issue capital that would 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.

[7]Preferential allotments 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 preferential allotment placement and 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).

Figure 2 provides an overview of the model structure, which is described in detail below.

3.1 Assets-in-Place (AIP)

At date τ = -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 of each outcome. The up-state payoff s is itself a random variable; at date τ = -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 $s = l$).

3.2 Hidden Value (HV)

The market believes that there could be hidden value (or a lack of it) in the firm, in addition to the publicly-known 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 τ = -1, and hence, there is no information asymmetry on that date. At date $\tau = 0^-$, owner-managers privately observe a signal of t, which helps them to make a call on their investment-financing decision.

3.3 Investment Opportunity (IO

At date τ = -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. The 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, the implication is that $I < \frac{1}{2}(x + y)$.

Two caveats are in order. First, it is important that we clarify our modeling choices about the structure of information. We could have modeled 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 provides the realistic flavor of postponing uncertainty resolution about cash flows arising from the asset-in-place (AIP) and the positive NPV project until the last possible date. More importantly, this framing allows us to stylistically capture the essence of the SEBI pricing rule, which depends on the price path dynamics, as we will discuss below.

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 a positive stock price 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. Without loss of generality, we set the deterministic part to be equal to 0 for convenience.

To summarize, at date $\tau = -1$, market participants are symmetrically informed about asset values. 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). All uncertainty in the model is resolved at date $\tau = 1$ and the firm is liquidated.

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, (ii) issue equity using the rights offering alternative (RO) and invest in the positive NPV opportunity, (iii) issue equity to themselves and/or to a set of large sophisticated institutional investors, using the preferential allotment mechanism (PA) and invest in the positive NPV opportunity, or (iv) reject the project and underinvest (UI).

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

This figure shows the schedule of events. At date τ = -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. Firm value is made up of value due to assets-in-place (AIP), consisting of a deterministic part normalized to 0 and an uncertain part described by equal-probability binary cash flows s,0, $s \in (h, l)$, a hidden value (HV), described by equal-probability binary cash flows of t, 0, $t \in (-H, H)$, and the NPV of the project if it is taken up.

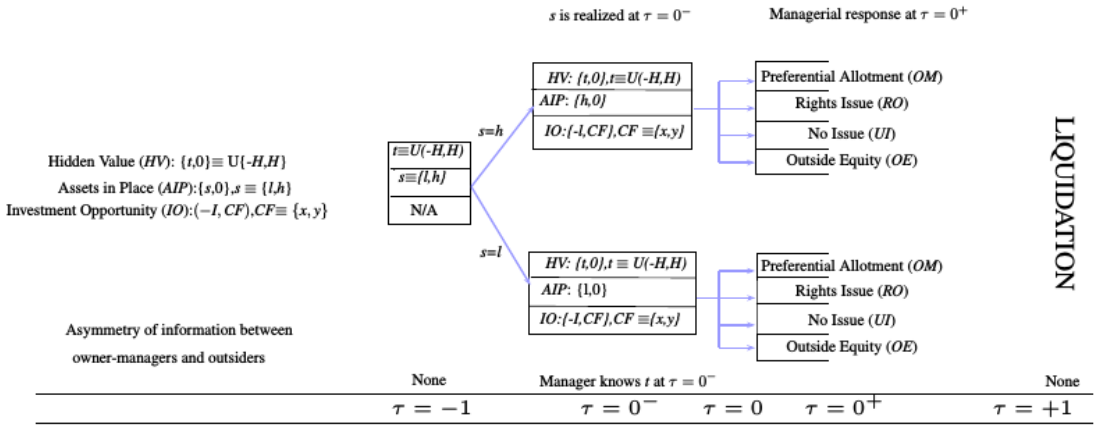

Figure 2: **Schematic Description of the Model**

3.4 Summary of Key Assumptions

We now present the main assumptions of the model:

(i) Firm value is made up of value due to assets-in-place (AIP), consisting of a deterministic part normalized to 0 and an uncertain part described by an equal-probability binary random variable $(s, 0)$, and a hidden value (HV), which is described by an equal-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 and/or large sophisticated institutional investors.

(ii) 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 (a proxy for the

most recent two-week average price) and the average firm value using date -1 and date 0 prices (this average serves as a proxy for the historical six-month average price). This assumption captures the essence of the SEBI regulations on the issue price in a preferential allotment.

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

(iv) There is information asymmetry only about the existing assets of the firm 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.

(v) Debt financing is ruled out.

(vi) 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 stock in excess of the investment in the project.

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

(viii) There are no taxes and transaction costs in the model.

(ix) There are no agency problems among the 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), who maximize the value of total holdings at $\tau = 1$, 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 and not about the investment opportunity. Employing this simpler setup allows us to focus on the key implications of this model, 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.

3.5 Premium paid in a preferential allotment

Before proceeding further, note that firm value at each point in time depends on the information available to the market at that point 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.[8] Furthermore, at date $\tau = 0^-$, the expected value of the assets-in-place (AIP) is equal to $s/2$. The value of the firm is given by the sum of the value of asset-in-place and the NPV of project. In other words, $V_{0^-}(s = h) = \frac{h}{2} + \frac{x+y}{2} - I$ and $V_{0^-}(s = l) = \frac{l}{2} + \frac{x+y}{2} - I$, and it follows that, 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 $V_{0^-}(s = h) > V_{-1} > V_{0^-}(s = l)$.

Starting from date τ = -1, prices can either go up ($s = h$) or down ($s = l$). We refer to these price trajectories as the "high price path" and the "low price path", respectively. 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. 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, as applied in the context of our model specification, require that the issue price should be at least as high as the current price. Conversely, on the low price path, SEBI regulations would imply that the issue price should be at least as high as 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.

Lemma 1 *The regulatory constraint on the issue price in a preferential allotment imposes a premium given by* $\frac{h-s}{4}, s = l, h$.

Proof: See Appendix (Proof of Proposition 1)

In essence, the lemma points out that the SEBI-mandated pricing rule is not binding for high price path preferential allotments. However, in low price path preferential allotments, owner-managers (and/or institutional investors) must pay a premium in the issue price (over and above the market value)

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

equal to $\frac{h-l}{4}$.

3.6 Wealth constraints of owner-managers

To generalize the model to consider the impact of joint participation of owner-managers and large sophisticated institutional investors, we introduce a parameter (γ) that reflects the percentage participation of the owner-manager in preferential allotments. The parameter γ is equal to $\frac{R}{I}$; R denotes the financial resources invested by the owner-manager in the preferential allotment and I denotes the total amount raised in the preferential allotment (and also the investment required for the positive NPV project). The remaining investment is provided by large sophisticated institutional investors. We refer to the parameter, γ, as the wealth-constraint parameter. It is possible that the decision to invest a partial amount (R) in the preferential allotment could also be driven by factors unrelated to wealth constraints. However, we abstract from such possibilities. In our model, it would be sub-optimal for the owner-manager to not fully subscribe to the preferential allotment when he sees a good signal of the hidden value. Therefore, a partial investment in a preferential allotment would arise only if the owner-manager faces severe wealth constraints.

In summary, our model generalizes to three situations: (i) pure owner-manager financed preferential allotments ($\gamma = 1$), (ii) joint preferential allotments financed partly by by owner-managers and partly by institutional investors ($0 < \gamma < 1$) and (iii) pure institutional investor financed preferential allotments ($\gamma = 0$). If wealth constraints necessitate a joint participation in a preferential allotment, we argue that owner-managers would prefer a joint participation with a set of large sophisticated institutional investors rather than outside equity investors, as in a rights offering or similar variations (that reflect different proportions of owner-manager and outsider equity investors). The reason for this preference is the potential dilution concerns caused by information asymmetry about the hidden value. We argue that it would be difficult to convince a large set of diffuse equity investors about potential hidden value. On the other hand, negotiating and convincing a single set of large sophisticated institutional investors about potential hidden value is relatively feasible, thereby providing an opportunity to mitigate or even avoid dilution effects. In other words, when faced with wealth constraints, owner-managers would consider two choices: jointly finance preferential allotment in combination with institutional investors (rather than outside equity investors) or underinvest.

We classify wealth constraints as mild if $\alpha \leq \gamma \leq 1$, i.e., the participation of

the owner manager (γ) in the preferential allotment is greater than or equal to the pre-allotment ownership (α) in the firm. We refer to the alternative situation with $0 \leq \gamma < \alpha$, as one with severe wealth constraints. The investment financing decision in the two situations is discussed below in the proposition.

3.7 Investment-financing decision

Proposition 1 *The investment-financing decisions of owner-managers depends on their private signals about the hidden value (t).*

- *(i) Under mild wealth constraints, i.e, $\alpha \leq \gamma \leq 1$, there is no underinvestment in this 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 owner-manager chooses the outside equity alternative (OE), for all $t : 0 < t \leq \hat{t}(s)$, the owner-manager prefers the rights offering alternative (RO), and for all $t \geq \hat{t}(s)$, the owner-manager chooses the preferential allotment alternative (PA).*

- *(ii) Under severe wealth constraints, i.e., $0 \leq \gamma < \alpha$, underinvestment may arise in the economy. The owner-managers' investment-financing decision can be summarized by two threshold cutoffs, $\hat{t}(s) = \frac{h-s}{4}$ and $\bar{t}(s) = \left[\frac{h-s}{4} + 2\left(\frac{NPV}{I}\right)\left(\frac{1}{1-\frac{\gamma}{\alpha}}\right)\left(\frac{h+3s}{8} + \frac{x+y}{2}\right)\right]$. For all $t < \hat{t}(s)$, the owner-manager chooses the outside equity alternative (OE), for all $t : \hat{t}(s) \leq t \leq \bar{t}(s)$, the owner-manager chooses the preferential allotment (PA), and for all $t > \bar{t}(s)$, the owner-manager underinvests.*

Proof: See Appendix (Proof of Proposition 1).

As stated above, the owner-managers' financing choice depends on t, the signal of hidden value that they privately observe at $\tau = 0^-$. Three key tradeoffs determine the owner-manager's investment-financing decision: (i) the strength of her private information signal about the hidden value, (ii) the degree of her wealth constraints, and (iii) the price path of the stock in the recent past (i.e., whether the price path is a "high" price path with $s = h$ or a "low" price path with $s = l$); the SEBI-mandated issue price rule kicks in for the low price path. Proposition 1 articulates these tradeoffs and the table below provides a schematic summary.

The table below presents the optimal financing choices of owner-managers among the following: (i) issue of equity to outsiders (OE), (ii) rights offerings (RO), (iii) preferential allotments (PA); (iv) underinvestment (UI) is also in the feasible choice set. The trade-offs that drive this decision are: (i) the strength of the private information signal ($t > 0$) of Hidden Value (Asymmetric Information Signal), which is categorized into three levels: weak, intermediate and strong,(ii) owner-managers' wealth-constraints, which can be either mild ($\gamma \geq \alpha$) or severe ($\gamma < \alpha$), and (iii) the recent price path of the stock (the SEBI-mandated issue price rule kicks in for low price path preferential allotments ($s = l$). Note, in this table we consider only positive signals (for $t < 0$, outside equity is always the preferred financing choice).

Owner-manager's investment-financing decision

Wealth Constraints\	Strength of private information signal		
Issue Price Constraints	Weak signal	Intermediate signal	Strong signal
Mild Wealth Constraints			
High Price path (s = h); issue premium = 0	PA	PA	PA
Low Price path (s = l); issue premium > 0	RO	PA	PA
Severe Wealth Constraints			
High Price path (s = h); issue premium = 0	PA	PA	UI
Low Price path (s = l); issue premium > 0	OE	PA	UI

Figure 3: **Schematic Summary of the Results**

The above table indicates that for strong signals of Hidden Value, preferential allotments are used under mild wealth constraints, but underinvestment is the preferred choice when wealth constraints are severe. For intermediate signals, the choice is always preferential allotments, and for weak signals, the role of SEBI-mandated issue price rule becomes important. To fully understand the interactions between asymmetric information, wealth constraints and regulatory constraints on the issue price, we first consider two extreme scenarios below.

3.7.1 Pure owner-manager preferential allotments, i.e., $\gamma = 1$

We refer to preferential allotments that are fully subscribed by owner-managers ($\gamma = 1$) as pure owner-manager preferential allotments (In this case, owner-managers are not financially constrained and can fully finance the investment). This case would fall under the category of mild wealth constraints. If $s = h$, i.e., if the price path dynamics is along the "high price path", the

cutoff $\hat{t}(h) = 0$. This implies that owner-managers issue equity to outsiders (OE) only if they observe a negative signal ($t < 0$); otherwise they issue equity to themselves (PA) through the preferential allotment mechanism (if $t > 0$). Note that the rights offering alternative (RO) is never taken up in this case.

In contrast, when $s = l$, i.e., when the price path dynamics follow the "low price path", $\hat{t}(s) \equiv \hat{t}(l) = \frac{h-l}{4}$, which 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 (OE). If the signal is substantially good ($t \geq \hat{t}(l)$), owner-managers prefer to issue equity to themselves (PA). For weakly positive signals ($0 \leq t < \hat{t}(l)$), the intermediate alternative of a rights offering (RO) is 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. When $s = h$, SEBI regulations require the preferential issue to be priced at least as high as the most recent valuation. This requirement ensures that the issue is "fairly priced". On the other hand, when $s = l$, the preferential issue has to be 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, than otherwise. In contrast to the $s = h$ case, owner-managers issue equity to themselves (PA) only for sufficiently positive signals of t above a strictly positive threshold cutoff value ($\hat{t}(l)$). In the intermediate signal range, the rights offering is the preferred alternative.

3.7.2 Pure institutional investor preferential allotment, i.e., $\gamma = 0$

First, $\gamma = 0$ corresponds to the severe wealth constraint scenario. The owner-manager does not participate in the preferential allotment. However, she would still prefer to avoid underinvestment in order to gain the benefits of a positive NPV project. When she observes a good signal of the hidden value, she would prefer a preferential allotment subscribed by institutional investors rather than the outside equity alternative to avoid dilution costs (note that the rights offering alternative is infeasible given the wealth constraint of the owner-manager). Thus the investment-financing decision reduces to one among two choices: (i) invest in the project using money raised in a pure

institutional investor preferential allotment, or (ii) underinvest.

If $s = h$, i.e., if the price path dynamics is along the "high price path", the lower cutoff of t for employing a pure institutional preferential allotment is $\hat{t}(h) = 0$. This implies that owner-managers issue equity to outsiders (OE), only if they observe a negative signal ($t < 0$); otherwise, if $t : 0 \leq t \leq \bar{t}(s)$, they issue equity to institutional investors (PA) through the preferential allotment mechanism; and for all $t > \bar{t}(s)$, the owner-managerS underinvest.

In contrast, when $s = l$, i.e., when the price path dynamics follow the "low price path", $\hat{t}(s) \equiv \hat{t}(l) = \frac{h-l}{4}$ is strictly greater than 0. If the signal is such that ($t < \frac{h-l}{4}$), owner-managers prefer to issue equity to outsiders (OE). If the signal is substantially good ($t : \frac{h-l}{4} \leq t \leq \bar{t}(s)$) they issue equity to institutional investors (PA) through the preferential allotment mechanism; and for all $t > \bar{t}(s)$, the owner-manager underinvests. Again, 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. Note that the rights offering alternative (RO) is infeasible because the owner-manager does not have sufficient resources.

3.7.3 Joint preferential allotment, i.e., $0 < \gamma < 1$

We now consider scenarios other than the two polar cases discussed above. These scenarios would reflect partial financing from both the owner-manger and the institutional investor. We find that the continuum of γ values can be categorized into two parts: (i) $0 < \gamma < \alpha$; this region represents severe wealth constraints and (ii) $\alpha \leq \gamma < 1$; this region represents scenarios with mild wealth constraints. The partitioning level of α that demarcates the two regions reflects the neutral scenario in which the owner-manager maintains the pre-allotment ownership level in the post-allotment period, i.e., the owner-manager's investment in the preferential allotment is proportional to her pre-allotment ownership level.

When the owner-manager faces mild wealth constraints (i.e., when $\alpha \leq \gamma < 1$), the cutoffs in t that define the preferential allotment region are invariant to γ. In fact, the investment-financing decision is identical to $\gamma = 1$ case discussed above (pure owner-manager financed preferential allotment). However, in the case of severe wealth constraints ($0 \leq \gamma < \alpha$), the investment-financing decision depends on γ because the right cutoff of t depends on γ. The pure institutional investor preferential allotment is a special case of this scenario with $\gamma = 0$.

To summarize, equity issues are priced on the basis of public information; the

resultant wedge in the issue price and the private full-information value seen by owner-managers drives the the opportunity costs/gains owner-managers face when choosing between different financing alternatives. This wedge is the source of the dilution effect feared by owner-managers when they consider the outside equity alternative. However, by issuing shares to themselves in a preferential allotment is converted into , the dilution effect (suffered with outside equity) is converted into a reverse dilution effect. In other words, owner-managers face an opportunity gain occurs when t is positive.[9]

When the owner-manager faces only mild wealth constraints, the investment-financing decision follows this basic rule: (i) If $s = h$, outside equity is used when $t < 0$ and joint or pure preferential allotment when $t \geq 0$, (ii) If $s = l$, rights offerings come into the picture for intermediate levels of t ($0 \leq \frac{h-l}{4}$) because of additional financing costs imposed by the SEBI-rule, and a preferential allotment for $t > \frac{h-l}{4}$.

When the owner-manager faces severe wealth constraints, the investment-financing decision gets modified because of two reasons. First, a rights offering is infeasible given severe wealth constraints of owner-managers. More importantly, under severe wealth constraints, the owner-manager has to share the benefits of the reverse dilution effect with institutional investors. This situation is akin to the one in the Myers-Majluf world. If the private signal of the hidden value is extremely favorable, the owner-manager would rather underinvest than give up too much of the benefit to the institutional investor. Thus, outside equity is preferred for bad signals of hidden value, preferential allotments are preferred for intermediate signals, and underinvesting is preferred for extremely good signal of hidden value. The SEBI-imposed issue pricing rule will further narrow down the range of t over which preferential allotments would be employed.

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 often have deep pockets and face less severe wealth constraints than do public corporations run by professional managers. Our model unambiguously shows that the underinvestment problem can be resolved by allowing preferential allotments to owner-managers, exclusively or in combination with institutional players. While this conclusion is intuitively reasonable, our model exploits the institutional peculiarities of an emerging market environment such as India

[9]Cronquist and Nilsson (2005) test the role of information asymmetry on the choice of rights offerings and preferential allotments. They find that preferential allotments are chosen by the issuers when information asymmetry in relatively higher.

to derive empirically testable implications associated with reactions to announcements of preferential allotments. This rigorous framework allows us to examine the importance of information asymmetry in explaining the announcement effects of preferential allotments. When wealth constraints are severe, the situation is similar to that in Myers and Majluf (1984), because in their model, owner-managers are assumed to be risk averse, which is mirrored by wealth constraints in our model.

3.8 Testable Empirical Implications

We next explore the properties of the critical thresholds that determine the set of t values for which the owner-manager employs the preferential allotment alternative.

Corollary 1.

i. The announcement period reaction associated with a preferential allotment, $\Delta P(s)$, is greater than 0:

$$\Delta P(s)|_{\gamma \geq \alpha} = \frac{1}{16}(h-s) + \frac{H}{4} > 0, s = l, h \tag{1}$$

$$\Delta P(s)|_{\gamma < \alpha} = \frac{h-s}{8} + \left(\frac{1}{1-\frac{\gamma}{\alpha}}\right)\frac{NPV}{2I}\left(\frac{h+3s}{8} + \frac{x+y}{2}\right) > 0, s = l, h \tag{2}$$

ii. The announcement period reaction under severe wealth constraints is less than or equal to the announcement period reaction under mild wealth constraints:

$$\Delta P|_{\gamma < \alpha} = \frac{h-l}{8} + \frac{NPV}{4}\left(\frac{1}{1-\frac{\gamma}{\alpha}}\right)(\frac{5h+3l}{8} + x + y) \tag{3}$$

$$\Delta P|_{\gamma \geq \alpha} = \frac{H}{4} + \frac{h-l}{32} \tag{4}$$

$$\Delta P|_{\gamma < \alpha} \leq \Delta P|_{\gamma \geq \alpha} \tag{5}$$

iii. The above inequality is strict if

$$\gamma < \bar{\gamma} = \alpha\left[1 - \frac{2\frac{NPV}{I}(\frac{h+3s}{8} + \frac{x+y}{2})}{H - \frac{h-s}{4}}\right]. \tag{6}$$

iv. The announcement period reaction ($\Delta P(s)$) depends on the price-path dynamics: $\Delta P(s = h) < \Delta P(s = l)$.

v. The difference of the difference in the announcement period reaction between the high price path ($s = h$) and the low price path ($s = l$) under severe wealth constraints is greater than or equal to that under mild wealth constraints, as given below:

$$[\Delta P(s = h) - \Delta P(s = l)]|_{\gamma<\alpha} \geq [\Delta P(s = h) - \Delta P(s = l)]|_{\gamma\geq\alpha} \quad (7)$$

Proof: See Appendix.

Corollary 1 (i) discusses the model's implications for the announcement period effects of preferential allotments. Upon the announcement of a preferential allotment, the market infers that the owner-managers must have seen a private signal, $t \geq \hat{t}(s)$. Since the hidden value is given by the (equally likely) outcomes $(t, 0)$, 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 under mild wealth constraints, is equal to $E[\frac{t}{2}|\hat{t}(s) \leq t \leq H]$, 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 (i) provides the announcement period returns for preferential allotments under mild wealth constraints after substituting for $\hat{t}(s)$. Note that the announcement period return is positive for preferential allotments. In a similar vein, one can compute the announcement period reaction for preferential allotments under severe wealth constraints. In this case, the region of t associated with preferential allotments is $t \in [\hat{t}(s), \bar{t}(s)]$.

Corollary 1(ii) follows after taking the expectation of $\Delta P(s)$, as defined in Equation (1), over the equally likely outcomes of $s = l$ and $s = h$, i.e., $\Delta P|_{\gamma<\alpha} = \frac{1}{2}\Delta P(s = l)|_{\gamma<\alpha} + \frac{1}{2}\Delta P(s = h)|_{\gamma<\alpha}$. In a similar vein, $\Delta P|_{\gamma\geq\alpha}$ is evaluated using Equation (2). Intuitively, this result arises because, under severe wealth constraints, preferential allotments are made only for intermediate signals of the hidden value and underinvestment is the preferred choice for signals in the right tail. On the other hand, under mild wealth constraints, there is no underinvestment and preferential allotments are employed for intermediate signal values as well as for the signal values in the right tail. Since the announcement period reactions reflect revelation of the hidden value, the announcement period reaction would be lower when owner-managers face severe wealth constraints.

Finally, Corollary (iii) follows after recognizing that under severe wealth constraints, the right cutoff of signal ($\bar{t}(s)$) that triggers underinvestment may

be greater than H and, therefore, there may be no underinvestment even under severe wealth constraints. When such a situation arises, $\bar{t}(s)$ will be capped at H and the announcement period reaction would be the same as under mild wealth constraints. The condition in Corollary 1 (iii) states that only if γ is strictly lower than an upper bound ($\bar{\gamma}$), i.e, the wealth constraints are sufficiently severe, $\bar{t}(s)$ will be strictly less than H, and underinvestment will arise and preferential allotments would be used for intermediate signals of the hidden value; consequently, the announcement period reaction would be strictly lower under severe wealth constraints than under mild wealth constraints only if $\gamma < \bar{\gamma}$.[10]

The constraint on $\bar{\gamma}$ in Equation (6) merits some discussion. First, note that $\bar{\gamma}$ is strictly less than α because the term in the square brackets on the right hand side of (6) is 1 minus a positive quantity. Further, the second term in the square brackets can attain a value greater than 1 (e.g., if the ratio NPV/I is high).[11] In this situation $\bar{\gamma}$ would become negative. Since γ can be never be less than 0, a negative value of $\bar{\gamma}$ implies that there is no γ value that will result in $\bar{t}(s) < H$. In other words, $\bar{t}(s) \geq H$. Now, the support of t is over $(-H, H)$ and therefore, $\bar{t}(s)$ will be constrained to be equal to H. Thus, the expression for $\bar{t}(s)$ in Proposition 1 can modified as $\bar{t}(s) = \min\left[\frac{h-s}{4} + 2\frac{NPV}{I}\frac{1}{1-\frac{\gamma}{\alpha}}(\frac{h+3s}{8} + \frac{x+y}{2}), H\right]$ to account for this situation.

Next, we relate the announcement period reaction to the price path dynamics. We show that the announcement period return for preferential allotments associated with a low price path is greater than that of allotments associated with a high price path. This result arises because the former are made only when the private information is good enough to recover financing costs imposed by the SEBI rule. The result in Corollary 1 (iv) is about the sign of the difference in announcement period reactions of preferential allotments following a high price path and preferential allotments following a low price path.

Corollary 1(v) discusses how this difference in the announcement period re-

[10]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, *ala* Myers and Majluf (1984). This implication is a well-documented empirical phenomenon across the world. The model also implies that rights offerings will be associated with positive announcement period effects, albeit less strong ones than in the case of preferential allotments.

[11]We can see from Equation (6) that this situation would arise when $2\frac{NPV}{I}(\frac{h+3s}{8} + \frac{x+y}{2}) > H - \frac{h-s}{4}$, i.e., when $\frac{h-s}{4} + 2\frac{NPV}{I}(\frac{h+3s}{8} + \frac{x+y}{2}) > H$.

action between the high price path and the low price path preferential allotment depends on γ. The results in Corollary 1(iv) and Corollary 1(v) are related in the sense that both are concerned with the announcement period reactions of low and high price path preferential allotments. While both results lead to empirically testable predictions, the result in Corollary 1(iv) can independently arise simply due to a momentum effect, which is strongly correlated with the price part dynamics (a high price path naturally implies positive momentum; similarly, and a low price price indicates negative momentum). Thus, the momentum effect may confound the empirical examination of Corollary 1(iv). However, the momentum effect would be mitigated in measures of the difference of difference. Thus, Corollary 1(v) offers a better chance of detecting the impact of the price path dynamics on the announcement period reaction.

Equality in the result in Corollary 1(v) follows after recognizing that that $\bar{t}(s) = H$ if $\gamma \geq \bar{\gamma}$ and the case of severe wealth constraints is equivalent to the case with mild wealth constraints. If, on the other hand, $\gamma < \bar{\gamma}$, it can be shown that the difference in difference of the announcement period return is greater in the case with severe wealth constraints.

4 Empirical Analysis

In this section, we present tests of the empirical implications developed in the previous subsection.

4.1 Data and Methodology

First, we discuss the regulatory framework along with its history followed by the current process of allotting preferential shares and the statutory requirements therein. This is followed by a synopsis of all the data available in the Prowess Database, followed by a discussion of how we constructed the current 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.

4.1.1 Process of Preferential Allotment

The process of allotting preferential (PPL) shares follows from the SEBI mandate that ensures fair pricing of the PPL. There was no guideline until 1994 on the matter. However, post that, things have been tightened and

currently, SEBI mandates all firms to follow a set process for PPL allotment. Currently, only those owners who have not sold shares in the 6 months before the relevant date are eligible to get PPL. The pricing norms are as follows:

- Higher of the
    a. average of the High and Low closing prices during 6 months before the relevant date and
    b. average of the High and the Low closing prices during 2 weeks before the relevant date
- Post Aug 2004, (High and Low?) closing prices are replaced with daily VWAP

where, Relevant date is 30 days before the AGM date when PPL is considered. Also, a lock-in clause is introduced, where the PPL allottees cannot trade these shares for 3 years. The complete timeline of evolution of the SEBI framework for PPL allotment is highlighted in the Online Appendix.

The allotment of PPL happens through a sequence of public events. First, firm informs the exchange that it intends to allot PPL through a notice calling a board meeting. This is the first time the public at large gets to know of the intent of PPL by the firm. In effect, this is the "Announcement Date". Next, the issue is discussed at the board meeting on the scheduled day as informed to the exchange. Should the resolution carry through in this board meeting, it is put to vote either in an Annual/Extraordinary General Body Meeting (A/EGM) or through Postal Ballot. Should the resolution carry in this, the exchange is immediately notified. It is from this date that relevant date (=AGM date – 30 days) for the SEBI-mandated price band computation is determined. Post this, another board meeting is called to discuss this and issue the PPL. A chronological enumeration of the process in presented in detail in the Online Appendix. It explains what dates are captured in the Prowess Database and what isn't.

The Prowess Database captures only the board meeting dates and announcement dates of such board meeting along with brief discussion items. Unfortunately, it does not capture the A/EGM or the result of Postal Ballot date. Hence, we construct 3 different scenarios using Announcement Date+10, Announcement Date+20 and Announcement Date+30 days as proxy Relevant Date. In summary, we capture the following 3 dates.

- Announcement Date, when the information is first available
- Board Meeting Date

- Issue Date

Further, we consider only issues where Pre-Board Meeting Date (Announcement date according to us and not the announcement date according to Prowess) is available. Next, we identify the number of securities issued from Prowess. This would match with actual changes in shares held by different categories of owners by construction. Based on the changes in shares held by different categories of owners, we can determine who the issuance was allotted to.

4.1.2 Sample Data

The sample data available and those derived therein are described as below.

1. Ownership classification:
    a. The Online Appendix gives a full categorization of ownership information as recorded by Prowess. For the purpose of our analyses, we consider only the following class of players ¡TBD after checking if it's grey ones or white ones¿
2. All relevant data:
    a. All reference data including group affiliation data from Prowess.
    b. All ownership data including pledging information from Prowess.
    c. All financial data including EBITDA, Debt Equity ratio etc. from Prowess
    d. All trading data like daily prices, volumes etc. for each of the firm in our sample from Prowess.
    e. All market index and aggregate trading data from BSE and NSE websites.
3. All derived data:
    a. We create several derived data like volatility, illiquidity measures from the raw data described in (2) above.

4.1.3 Sample Filtering Criteria

In this section, we briefly discuss the sample selection process. There were a total of 2,972 issues of PPL and PPL-QIP between Apr 2001 and Mar 2018. Of these, we were able to get the board meeting dates for 2,315 issues. Further filtering only for those issues where we were able to match the

overall shareholding pattern the size reduced to 1,753. Next, we filter out those issuances that were by banks and governmental firms. Also, we consider only fresh issuance of shares as against redistribution (change in shares outstanding greater than 1%). With this, the sample size reduced to 1,064. Table 2 gives a detailed filter of the sample selection. The Online Appendix provides more details about the sample selection process. Chart 1 gives the distribution of these issues by year for our sample (1,064 issues).

4.1.4 Summary Statistics

We describe the summary statistics in this section. Table 3 gives the overall summary statistics, and sample statistics by investor type and group affiliation, respectively.

4.2 Undervaluation Hypothesis

We formulate the following empirically testable predictions based on our model and the extant literature. Hypotheses P1-P4 are based on the empirical implications arising from the model and we refer to these collectively as the Undervaluation Hypothesis.

P1. The announcement period price reaction to preferential allotments should be positive.

P2. The announcement price reaction of pure institutional investor preferential allotments ($\gamma = 0$) should be lower than that of pure owner-manager preferential allotments ($\gamma = 1$).

P3. The announcement period reaction to preferential allotments should be (a) negatively related to the market capitalization of the firm, (b) positively related to volatility of returns (if it proxies for information asymmetry), (c) negatively related to the volatility of returns (if it proxies for the uncertainty in the private information of owner-managers of the firm), and (d) unrelated to the owner-managers' pre-announcement shareholdings.

P4. The difference in announcement period reaction to preferential allotments under a high price path and a low price path should be greater for pure institutional investor preferential allotments ($\gamma = 0$) than for pure owner-manager preferential allotments ($\gamma = 1$).

Prediction P1 follows directly from Corollary 1(i). Prediction P2 is an articulation of Corollary 1(ii) and Corollary 1(iii). Note that a negative value of $\bar{\gamma}$

implies that the inequality in (6) can never be satisfied since γ can never be less than 0. In other words, for a negative $\bar{\gamma}$, γ for any preferential allotment would always be greater, and, as discussed in Corollary 1(ii) and Corollary 1(iii), the announcement period reactions of preferential allotments under severe wealth constraints would be the same as the announcement period reaction of preferential allotments under mild wealth constraints. On the other hand, when $\bar{\gamma}$ is positive, all the preferential allotments with $\gamma < \bar{\gamma}$, $\bar{t}(s)$ would be less than H; in such cases, preferential allotments would arise only for intermediate signal values and the announcement period reaction of preferential allotments under severe wealth constraints would be lower than that under mild wealth constraints.

This prediction can be examined by comparing the cross-sectional averages of the announcement period reactions of preferential allotments under severe wealth constraints ($\gamma < \alpha$) with that of preferential allotments under mild wealth constraints ($\gamma \geq \alpha$). There is only one caveat, however. Since $\bar{\gamma}$ varies across firms (due to differences in model parameter values), the cross-sectional average under either wealth constraint (mild or severe) would reflect both type of firms: firms with $\gamma < \bar{\gamma}$ as well as firms with $\gamma \geq \bar{\gamma}$. It would be difficult to conclude whether Equation (5) would hold as a strict inequality or as an equality when we examine cross-section averages of preferential allotment. One way to get out of this conundrum is to recognize that the announcement period reaction of preferential allotments with severe wealth constraints is increasing in γ (as can be seen in Equation (2). Thus, the chances of observing cross-sectional differences in announcement period reactions is maximized when we compare preferential allotments in the two polar cases of $\gamma = 0$ and $\gamma = 1$. Prediction 2 is therefore framed in terms of these two polar cases of wealth constraints.

Prediction P3a is based on the argument that large-cap firms are followed by more analysts, and therefore, information asymmetry is lower in large-cap firms. Thus, we can expect lower hidden value in large-cap firms, and consequently lower market reaction upon announcement of a preferential allotment.

If volatility of returns is considered to be proxy for information asymmetry (or the amount of information), we should expect to see a positive relation between announcement period returns and volatility (Prediction P3b). On the other hand, if volatility proxies for greater risk, i.e., uncertainty about the likelihood of the hidden value being finally realized, the market reaction to a preferential allotment issue would be lower (Prediction P3c). Prediction P3d follows from Equation (1).

Prediction P4 follows from Corollary 1(v). A direct test of the difference between announcement period returns between the high price path and the low price path (as implied in Corollary 1(iv)) is likely to be confounded by the momentum factor, which would be strongly correlated with price path. Therefore, we indirectly test this effect by focusing on the difference in announcement period reaction across the high price path and the low price path and examining how it varies with other parameters in the model. Corollary 1(v) shows that the difference is negative under mild wealth constraints ($\gamma \geq \alpha$) and is lower than under severe wealth constraints. We use the same argument employed in Prediction P2 to frame the hypothesis in Prediction P4 in terms of the announcement period reactions in the two polar cases: pure owner manager preferential allotments ($\gamma = 1$) and pure institutional investor preferential allotments ($\gamma = 0$).

4.3 Competing Hypotheses

Some of the above predictions can also arise from competing hypotheses while other predictions are unique to our model; thus, a comprehensive empirical analysis would help us distinguish between competing explanations. For instance, Prediction P1 states that the announcement period returns in preferential allotments to owner-managers should be positive. Exactly the converse of Prediction P1 is implied by the Entrenchment Hypothesis, which suggests that preferential allotments should be associated with negative announcement period returns because of managerial self-dealing.

Prediction P2 differs from the implication of the Monitoring Hypothesis, which argues that since institutional players are active shareholders, the announcement period reaction should be higher. Similarly, the Certification Hypothesis argues that private equity players often possess superior information about the prospects of a firm and their participation is a signal of value. Thus the Certification Hypothesis also argues that the announcement period reaction of preferential allotments to institutional investors should be higher. The Entrenchment Hypothesis would also argue that owner-managers expropriate shareholder wealth and therefore preferential allotments to institutional (outsiders) should have higher announcement period returns.

The Undervaluation Hypothesis states that announcement period returns should be negatively related to volatility (Prediction P3c). This hypothesis is also implied by the Certification Hypothesis and the Monitoring Hypothesis. As information asymmetry (volatility is a proxy) increases, certification and monitoring costs increase, thereby implying an adverse impact on announcement period returns. The Entrenchment Hypothesis has no predictions for

the relation between announcement period returns and volatility.

Prediction P3d states that announcement period reaction should be unrelated to owner-manager shareholdings. On the other hand, the Certification Hypothesis and the Monitoring Hypothesis suggest that announcement period returns should be positively related to owner-manager shareholdings because the owner has more skin in the game. The Entrenchment Hypothesis suggests that greater insider ownership is associated with greater managerial self-dealing and announcement period reaction should therefore be decreasing in insider ownership.

Prediction P3a and P4 are unique to the Undervaluation Hypothesis. The competing hypotheses have implications related to the remaining hypothesis (in some cases in same direction as the Undervaluation Hypotheses and in other cases the opposite). More precisely, (i) Predictions P1 - P4 can be classified under the Undervaluation Hypothesis , (ii) Predictions P2, P3c, and the converse of Prediction P3d can be classified under the Certification Hypothesis, (iii) the converse of Prediction P2, Prediction P3c, and the converse of Prediction P3d can be classified under the Monitoring Hypotheses, and (iv) the converse of Prediction P1 and converse of Prediction P3c can be classified under the Entrenchment Hypotheses. Given the overlapping nature of these hypotheses, a comprehensive analysis of the Undervaluation Analysis and the competing hypotheses is required to help us understand the relative validity of alternative hypotheses in explaining preferential allotments.

4.4 Multivariate Regression Results

The multivariate regression results are reported in Table 4. The dependent variable in all these regressions is the announcement period return. We run separate regression in which each of the following four windows of cumulative abnormal returns (CAR) around the announcement dates of preferential allotments serve as the dependent variable: [*CAR(-1, +1)*, *CAR(-5, +5)*, *CAR (-10, +10)* and *CAR (-21, +21)*]. In addition, we estimated the CARs with an adjustment for the market return only - in effect assuming that all the slope coefficients were one. These alternative estimations yielded qualitatively similar results, which are not reported here in the interest of brevity. We study these four windows to take into account (il)liquidity arising 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)*, *CAR (-10, +10)* and the *CAR(-21,+21)* results. The explanatory variables are arranged by category - firm characteristics, issue characteristics, investor characteristics and owner-manager stake.

There is a significant positive coefficient on the owner-manager issuance dummy term in all the regressions, except in the case of the 21-day window in which the coefficient is of the same sign but of weaker statistical significance. This result confirms that pure owner-manager preferential allotments have a higher announcement returns than institutional based preferential allotments, consistent with Prediction P2 of the Undervaluation Hypothesis. The overall sample announcement period return effect could be computed as the sum of the intercept term and the coefficients on the owner-manager issuance dummy and the institution issue dummy. The 21-day window regression results suggest that the overall announcement return effect is positive, confirming Prediction P1.

The coefficient of the log of market capitalization is significantly negative, confirming Prediction P3a, which implies that small-cap firms (with greater information asymmetry about hidden value) should experience a higher return upon announcement of a preferential issue because more information is revealed when small-cap firms announce preferential allotments. The negative coefficient on annualized volatility term rejects Prediction P3b but confirms Prediction P3c, which argues that volatility is a proxy for the uncertainty in private information of owner-managers about the hidden value in the firm, and therefore, announcement period returns should be negatively related to volatility. Prediction P3d is also confirmed in that they coefficient on owner-manager's equity holding (prior to the preferential allotment) is statistically insignificant.

The coefficient on the price path dummy is significantly positive, but as mentioned earlier, this effect could be an artifact of momentum. The coefficient on the interaction term between price path dummy and owner-manager issuance dummy is negative in all the four regressions, but statistically significant only in the 1-day and 5-day window regressions. The negative sign is consistent with Prediction P4.

The strong positive coefficient on EBITDA, which has been included as control variable is along expected lines. The magnitude of hidden value is likely to be correlated with EBITDA and the positive sign of the coefficient indicates that the market factors this information in the announcement period reaction.

Table 1 summarizes the results established so far. In Panel A, we assess the validity of the Undervaluation Hypothesis, the Certification Hypothesis, the Monitoring Hypothesis and the Entrenchment Hypothesis by comparing the predictions of the hypotheses with the actual empirical findings. There are two columns under each hypothesis – a predictions column and a confirmation

column whose entries show a if the prediction is confirmed in the data, otherwise an X if the findings are inconsistent with the prediction. Overall, when we inspect the confirmation column, we can see that the Undervaluation Hypothesis fares quite well with maximum number of s. The Certification Hypothesis and the Monitoring Hypothesis show mixed results with some predictions confirmed and others rejected. The Entrenchment Hypothesis can be rejected for this sample of data.

Table 1: This table summarizes the predictions of the alternative explanations of private placements, namely, the Undervaluation Hypothesis, the Certification Hypothesis, the Monitoring Hypothesis, the Entrenchment Hypothesis, the Manipulation Hypothesis, the Tunneling Hypothesis and the Efficient Internal Capital markets Hypothesis. It also presents information on whether the predicted relations are confirmed ($\surd$) in the data or not confirmed (X) in the data. In case a hypothesis has no prediction on a variable, we use the notation "—" to indicate that this cell is not applicable. The table is useful to assess and contrast the Undervaluation Hypothesis and alternative explanations of preferential allotments.

*Pred.≡ Predicted relation, Conf.≡ Empirical findings confirm the prediction ($\surd$) or not (X)? ** $\gamma = 0 \equiv$ pure institutional allotment, $\gamma = 1 \equiv$ pure owner-manager allotment.

Panel A: Undervaluation, Certification, Monitoring and Entrenchment Hypotheses

Empirical Test	Undervaluation Hypothesis		Certification Hypothesis		Monitoring Hypothesis		Entrenchment Hypothesis	
	Pred.*	Conf.*	Pred.	Conf.	Pred.	Conf.	Pred.	Conf.
P1. Ann. Period Returns	+ve	$\surd$	+ve	$\surd$	+ve	$\surd$	-ve	X
P2. Ann. Ret: ($\gamma = 0$ vs. $\gamma = 1$)**	lower	$\surd$	higher	X	higher	X	higher	X
P3a. Ann. Period Ret vs. Mkt-cap	-ve	$\surd$	—	—	—	—	—	—
P3b/3c. Ann. Period Ret vs. Volatility	+ve/-ve	$\surd$ (-ve)	-ve	$\surd$	-ve	$\surd$	—	X
P3d. Ann. Period Ret vs. Ownership	none	$\surd$	-ve	X	-ve	X	-ve	X
P4. Ann. Period Ret vs. Price path interaction with owner-issuance	-ve	$\surd$	—	—	—	—	—	—

Panel B: Business Group Related Hypotheses

Empirical Test of Announcement Period Returns	Pred.	Conf.
P5a. Group vs. Stand-Alone (Tunneling Hypothesis)	-ve	X
P5b. Group vs. Stand-Alone (Efficient Internal Capital Markets Hypothesis)	+ve	$\surd$, X

Panel C: Manipulation Revelation Hypothesis

Empirical Test	Predicted	Confirmed
P6a. Ann. Period Returns vs. Illiquidity	+ve	X
P6b. Ann. Period Returns vs. Variance Ratio	-ve	X
P6c. Ann. Period Returns vs. CAV(-250, 50)	+ve	X

To elaborate further, Predictions P3a and P4, which are unique to the Undervaluation Hypothesis, are both confirmed in the empirical findings. Predictions P2 and P3d are useful in distinguishing between the Undervaluation Hypothesis and the competing hypotheses because their predictions are opposite of each other. The prediction of the Undervaluation Hypothesis for announcement period returns of owner-managers versus institutional is exactly opposite that of the predictions of the competing hypotheses. The Undervaluation Hypothesis says that owner-manager preferential allotments should have a higher announcement period return as compared to institutional preferential allotments (Prediction P2) whereas the competing hypotheses claim the exact opposite. The empirical findings for P2 confirm the prediction of the Undervaluation Hypothesis and reject the predictions of the competing hypotheses. A similar situation arises for Prediction P3d, which relates announcement period returns to pre-announcement insider ownership. The results are consistent with the Undervaluation Hypothesis, but they are inconsistent with the competing hypotheses. The remaining predictions, P1 and P2 are associated with similar predictions of the Undervaluation Hypothesis and the competing hypotheses, and thus, are unhelpful in distinguishing between the hypotheses. However, it is important to note that the empirical findings are consistent with the predictions of the Undervaluation Hypothesis.

4.5 Business Group Related Hypotheses

In addition to the hypotheses based on our model, we also test the following hypothesis that arises in the context of business groups:

P5a. *Preferential allotments issued by business group-affiliated firms should experience lower announcement period reaction as compared to stand-alone firms.*

P5b. *Preferential allotments issued by business group-affiliated firms should experience higher announcement period returns as compared to stand-alone firms due to more efficient internal capital markets.*

Baek et al. (2006) find that group firms are able to expropriate shareholder wealth by issuing shares at steep discounts in preferential allotments. As noted earlier, business groups in India often engage in preferential allotments. Furthermore, evidence from business group literature indicates that group holding companies indulge in tunneling resources (Bertrand, Mehta and and Mullainathan, 2002) from group firms. Given this propensity, it is likely that preferential allotments by business groups will be viewed less favorably than

those made by stand-alone firms. Both these pieces of evidence suggest that announcement period returns should be lower for business group preferential allotments (Prediction P5a]. On the other hand, a rationale for existence of conglomerates and business groups in emerging markets that centralized decision making leads to more efficient internal capital markets, as argued in Stein (1997). Prediction P5.b takes this stance.

The results can be seen in Table 4. The group affiliation dummy coefficient is positive in all regressions but statistically significant only for the 1-day and 5-day windows. This result does not support Prediction P5a which states that abnormal returns are lower for group firms than for stand-alone firms due to managerial entrenchment (Entrenchment Hypothesis posited in Baek et al. (2006)). On the other hand, these results support the Efficient Internal Capital Markets Hypothesis, P5b (Stein, 1997), which claims that business groups ensure more efficient resource allocation.

4.6 Manipulation Revelation Hypothesis

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.[12] 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 simply due to a fear of manipulation by the latter. We refer to this effect as the *Manipulation 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 explicit information asymmetry about the hidden value of the assets, because owner-managers can gain just by buying their stocks at depressed prices. A key implication of the Manipulation Revelation Hypothesis is that announcement period returns are increasing in the proxies for manipulation.

Thus, we can empirically establish whether the data support the Manipulation Revelation Hypothesis or the Undervaluation Hypothesis (after accounting for manipulation possibilities). Below, we state the predictions of

[12]In the online appendix, we present a version of the asymmetric information model that takes into account manipulation possibilities. We find that manipulation has no material impact on announcement period returns in the model.

the Manipulation Revelation Hypothesis. Predictions P6a, P6b and P6c are useful because they present testable propositions that are unique to the Manipulation Revelation Hypothesis.

P6a. *The announcement period reaction should be positively related to the illiquidity of the firm's stock.*

P6b. *The announcement period price reaction should be positively related to the abnormal volume experienced during the six-month period prior to the announcement date.*

P6c. *The announcement period price reaction should be positively related to the short-term volatility proxies during the six-month period prior to the announcement date(negatively with variance ratio/positively with Garman Klass volatility estimator) .*

Prediction P6a follows because illiquidity reduces the costs of manipulating asset prices (market prices move much more in 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 will have greater incentives to manipulate prices, since they will have a greater "bang for the buck" for the resources they employ in manipulation. As a result, the abnormal returns will be higher because the market will infer the worst upon the announcement of a preferential allotment to owner-managers. As stated in Prediction P6a, the announcement period reaction should be increasing in the illiquidity of the stock.

Prediction P6b and Prediction P6c are based on the same logic, except that they use different proxies for manipulation. The first empirical proxy for manipulation is the abnormal volume in the six-month period prior to the announcement date. If the announcement of the preferential allotment is perceived by the market as confirmation of pre-announcement market manipulation by the firm's owners, the announcement period reaction should be positively related to abnormal volume in the pre-announcement period.

Price manipulation is likely to cause an increase in short-term volatility. Prediction P6c uses two measures of the short-term volatility as proxies of price manipulation, namely, variance ratio (ratio of monthly variance to daily scaled variance) and Garman-Klass intraday volatility. A low variance ratio indicates that daily variances are too high either due to noise trading or speculation. Manipulation would be associated with a lower variance ratio. Thus, if manipulation is driving the announcement period returns, we should expect to see a negative relation between announcement period returns and the variance ratio. The Garman-Klass measure is a direct measure of volatility

and the expected sign is positive.

Table 5 presents the same analysis as in Table 4 after controlling for price manipulation proxies. 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 (Prediction P6a). We use the Amihud measure of illiquidity [Amihud (2002)]. If the manipulation revelation effect is an important factor, we should see a positive relationship between announcement period returns and illiquidity.

To test Prediction P6b, we use information contained in the volume run up before the announcement period as a proxy 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 expected relation is positive, i.e., manipulation will lead to higher announcement period returns. We that coefficient on CAV is statistically insignificant in three windows. Only for the 21-day regression, the coefficient is statistically significant, but it holds a negative sign which contradicts Prediction P8.

The additional proxies we employ to detect manipulation are the variance ratio and the Garman-Klass volatility estimator during the pre-announcement period. The variance ratio, which measures the ratio of monthly variance to daily scaled variance, tends to be lower when manipulation occurs because manipulation-based trades push prices beyond their normal boundaries, causing excessive daily volatility. The expected sign of the coefficient of variance ratio is negative. As can be seen in Table 5, the coefficient of variance ratio is statistically insignificant in some regressions. In other regression in which, it is statistically significant, it holds exactly the opposite sign to that predicted by Prediction P6c. In addition, the coefficient on Graman-Klass volatility estimator is also statistically significant in one regression of the CAR (-5,+5) window, and insignificant in other columns.

Thus, our overall evidence strongly rejects the Manipulation Revelation Hypothesis, as stated in P6a-c. More importantly, all the variables that were significantly related to announcement period returns (Table 4) continue to retain their significance in Table 5. These findings assure us that the conclusions drawn from Table 5 are robust to empirical specifications that account for manipulation.

4.6.1 A summary of the Empirical Analysis

Reviewing Table 1, we can see from Panel A that finding related to Predictions P1-P4 are largely supportive of the Undervaluation Hypothesis presented in the model. As can be seen in Panel B, our results also support the Efficient Internal Capital Markets Hypothesis, P5b (Stein, 1997), which claims that business groups ensure more efficient resource allocation. Finally, with regard to testable predictions on manipulation (Predictions P6a, P6b and P6c) and we find no evidence in support of manipulative behavior during the period prior to the announcement. Thus, all our key findings related to the Undervaluation Hypothesis are robust in the sense that they persist after we control for manipulation.

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. We find that the announcement period returns for preferential allotments are (1) positive, (2) higher for pure owner-manager preferential allotments, (3) negatively related to market capitalization, (4) negatively related to volatility, (5) unrelated to pre-announcement insider ownership and (6) affected by the interaction between the price path and owner-manager's allocation in the preferential allotment. Overall, the evidence regarding

5 Conclusion

The empirical literature on private placements of equity suggests that managerial entrenchment is perhaps an 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 preferential allotments to owner-managers, particularly in emerging markets, suggests that there is more to the story than just managerial self-preservation.

In this paper, we propose an extension of the Myers and Majluf (1984) model to show that the optimal investment-financing decision of firms depends on the interaction between information asymmetry and wealth constraints faced by owner-managers. If owner managers face mild wealth constraints, we show that preferential allotments to owner-managers can partially resolve, if not eliminate the underinvestment problem. This result seems intuitive - there is no information asymmetry problem when insiders finance the equity issue, and underinvestment is unlikely. Since owner-managers are critical sources of capital in emerging markets, the benefits of resolving the underinvestment problem may outweigh qualms about managerial self-dealing (in the form of

a price manipulation), especially given the buffer provided by the regulatory constraints on the issue price in preferential allotments. Further, when owner-managers are resource constrained, institutional players can help bridge the gap in funding and help resolve the underinvestment problem. These results, taken together, suggest a positive role for private placements in emerging markets in resolving the underinvestment problem, in contrast to the negative implications of managerial entrenchment associated with private placements in the U.S.

We find empirical 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. In this paper, we have treated the SEBI issue price restriction as an exogenous imposed constraint. 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.

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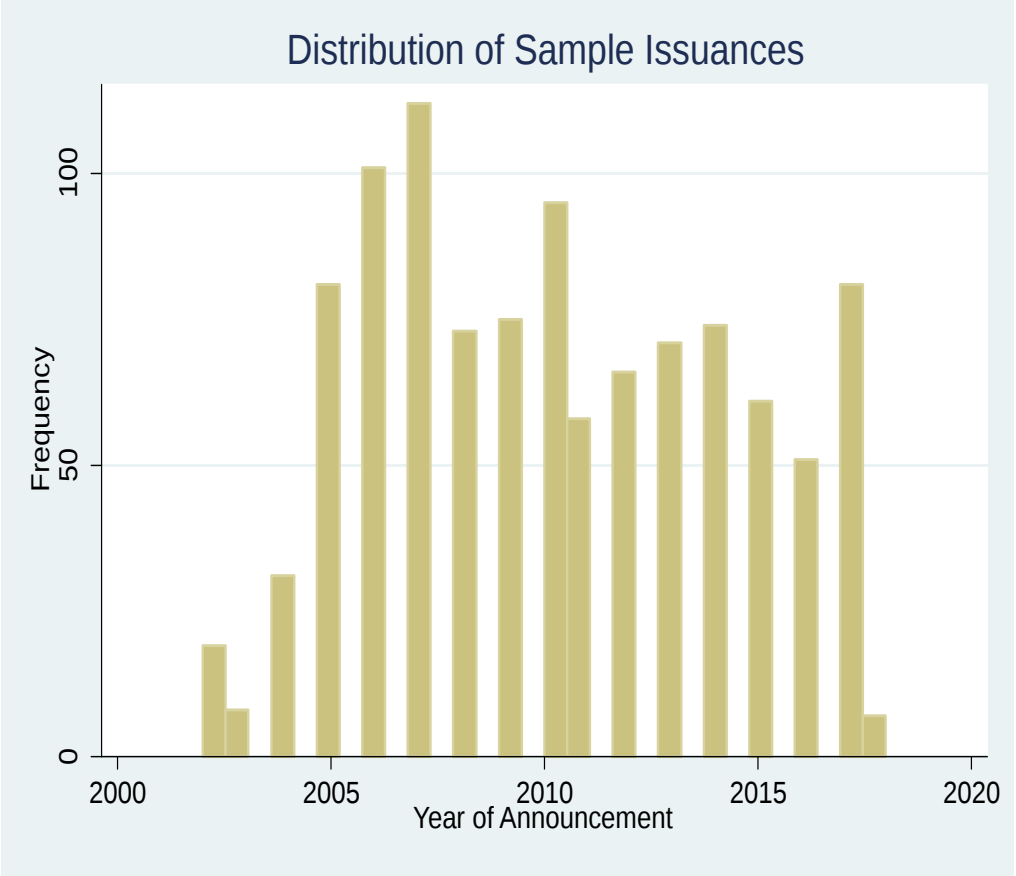


Figure 4: **Preferential Allotment Frequency (2002-2017)**

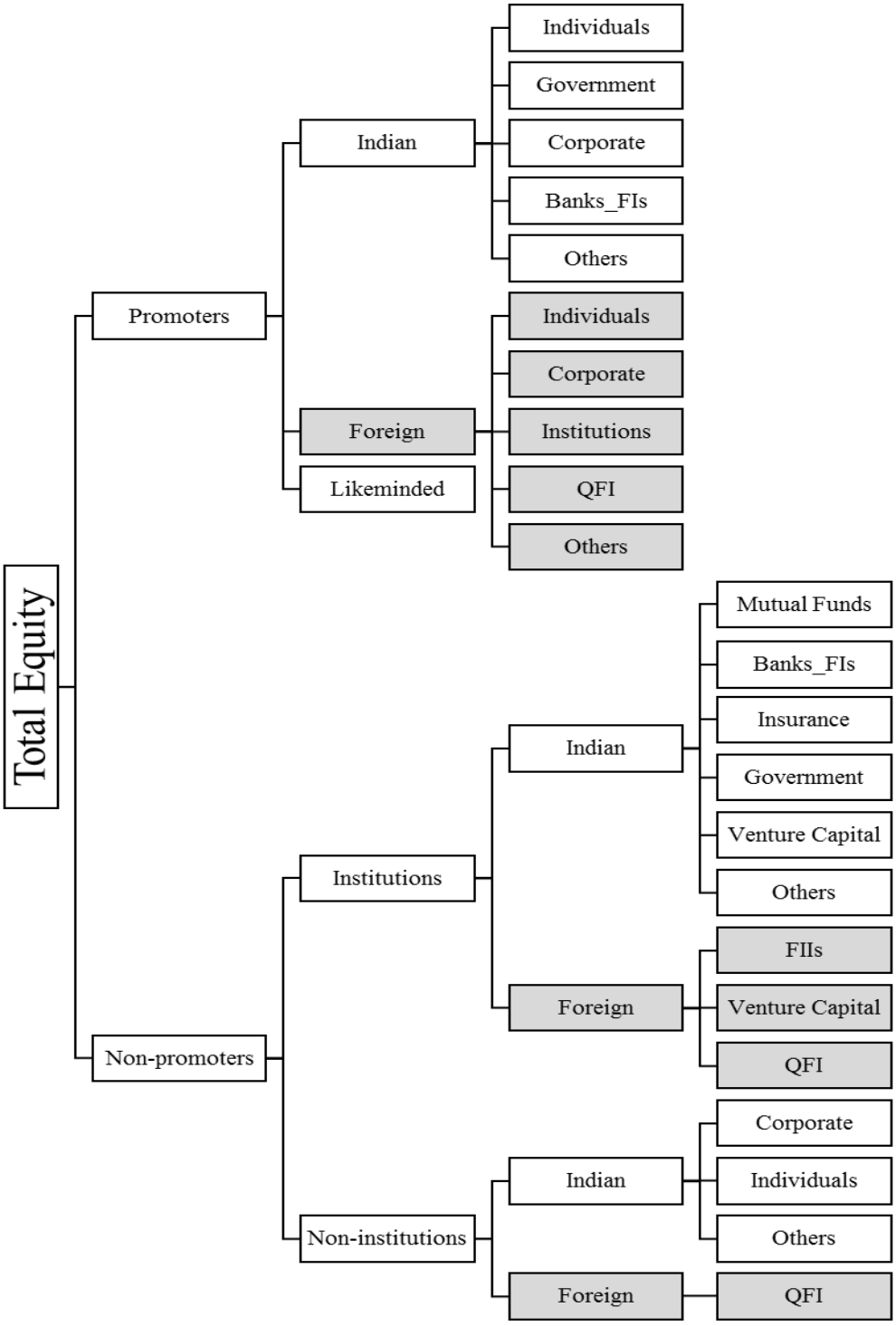


Figure 5: **Equity Ownership Composition**

Table 2: Sample Selection. This table presents details of our sample selection using CMIE Prowess data. PPL refers to preferential allotment of securities. Relevant board meeting is the board meeting that is called to discuss PPL issuance prior to recommending them for shareholder approval in the Annual General Meeting (AGM). Companies inform stock exchanges (who publicly disclose them immediately on their website) about the relevant board meeting a few days before the actual meeting is held. We assume 2 days if intimation to exchanges is missing. We use the exchange intimation date as the announcement date as it is the earliest date that the market is aware of an imminent PPL issuance. Shareholding, financial and business group affiliation data are also from CMIE Prowess. Issuance date is the date when shareholders approve PPL issuance in an AGM. We use 20 days post announcement as the issuance date as CMIE Prowess does not capture AGM dates. High price path firms are firms whose volume-weighted average price in the two weeks preceding issuance date is higher than the volume-weighted average price in the 26 weeks preceding issuance date.

* Shares issued under PPL matches with changes in shares outstanding reported in that quarter (may not match because of other confounding issues)
+ PPL = preferential allotment; QIP = qualified institutional investors; ** Based on whether shares issued to owner-managers exclusively

s Total equity issuances under PPL and PPL-QIP (Jan-2001 to Mar-2018)	2,972
Issuances for which we have relevant Board Meeting date information	2,315
Issuances with clean announcement dates	*1,968*
Issuances with assumed announcement dates (=2 days prior to relevant Board Meeting)	*347*
Issuances with matched overall share-holding pattern data*	1,784
Issuances with matched owner-group wise share-holding pattern data (needed to ensure which owner category - promoter, non-promoter, custodian - were allocated shares)	1,753
Issuances by non-government (Central/State), non-banking firms	1,660
Issuances with firm-level financial and trading data	1,282
Issuances with mostly fresh issue of shares as opposed to redistribution of shares among owners and ¿1% of existing shares outstanding	**1,064**
Issuances involving only one type (PPL/PPL-QIP+) on issue day	*1,057*
Issuances involving more than one type on issue day	*7*
Issuance to qualified institutional investors	*93*
Issuance to other investors	*971*
Issuances by business group firms	*385*
Issuances by stand-alone firms	*679*
*Issuances to owner-managers***	*241*
Issuances to others	*823*
Issuances by low price path firms	*356*
Issuances by high price path firms	*708*

Table 3: This table presents summary statistics of key variables in our sample data. All the variables are from CMIE Prowess database. Market capitalization and closing price are based on previous six months' averages. Monthly return represents monthly average of close-to-close returns over the previous year. Volatility is daily close-to-close return standard deviation over a year multiplied by square root of 252. Garman-Klass volatility is daily intra-day volatility using open, close, high and low prices multiplied by square root of 252. Amihud illiquidity measure is computed as the average ratio of return over value traded over the previous month. Variance ratio represents the ratio of monthly volatility over scaled daily volatility (daily volatility x square root of 21). Owner-managers represent promoters and related entities including subsidiaries as defined under the Indian securities regulations. Shares pledged refers to shares that have been used as collateral for private loans taken out by owners. PPL refers to preferential allotment of securities. Relevant board meeting is the board meeting that is called to discuss PPL issuance prior to recommending them for shareholder approval in the Annual General Meeting (AGM). Companies inform stock exchanges (who publicly disclose them immediately on their website) about the relevant board meeting a few days before the actual meeting is held. We assume 2 days if intimation to exchanges is missing. We use the exchange intimation date as the announcement date as it is the earliest date that the market is aware of an imminent PPL issuance. Shareholding, financial and group affiliation data are also from CMIE Prowess. Issuance date is the date when shareholders approve PPL issuance in an AGM. We use 20 days post announcement as the issuance date as CMIE Prowess does not capture AGM dates. High price path firms are firms whose volume-weighted average price in the two weeks preceding issuance date is higher than the volume-weighted average price in the 26 weeks preceding issuance date.

Panel A: Overall Sample

	Mean	Median	Std	Min	Max
Market Cap in Rs M (6-monthly Average)	4,120.11	598.67	11,626.65	19.37	85,457.46
Close Price (6-monthly Average)	97.70	37.81	168.80	1.08	1,098.57
Monthly Return (12-monthly Average) in %	6.57%	4.95%	24.54%	(69.73%)	88.88%
Annualized Volatility (scaled using daily volatility over past year) in %	64.88%	62.21%	19.74%	29.03%	152.06%
Annualized Garman-Klass Volatility in %	17.69%	16.21%	8.83%	2.03%	53.66%
Variance Ratio (monthly variance over scaled daily variance)	14.70	4.33	26.93	0.00	153.7
EBITDA as percent of Income	16.61	12.05	29.47	-126.67	89.77
PAT as percent of Income	-7.86	2.83	72.76	-600.00	65.17
Total Assets in Rs M	8,178.84	1,396.30	23,505.67	18.50	185619.80
Net Fixed Assets in Rs M	2,034.73	338.50	5,831.38	0.10	44,730.40
Debt Equity Ratio in multiples	1.85	0.84	3.92	0.00	32.19
Average Daily Value Traded in Rs. M	22.72	1.32	76.35	0.00	581.91
Amihud Illiquidity Ratio over previous month	6.02	0.04	19.54	0.00	130.85
Shares held by Owner-Managers in %	45.56	47.51	18.11	0.32	80.35
Shares Pledged by Owner-Managers in %	10.92	0.00	24.93	0.00	100.00
Price Path Ratio	1.16	1.09	0.36	0.38	2.38
Preferential Allotment as % of Shares Outstanding (prev qtr)	26.59	14.05	38.24	1.37	249.44
Preferential Allotment as % of Owner-Manager Shares (prev qtr)	124.96	29.89	399.74	2.68	3080.80
Preferential Allotment to All Owner-Managers in %	37.13	3.66	43.85	-2.68	100.91
Preferential Allotment to All Institutional Investors in %	18.02	0.00	38.00	-50.58	131.83
Days from Announcement to First Board Meeting	2.41	2.00	1.55	1.00	11.00
Days from Announcement to Issue	26.93	31.00	46.34	1.00	286.00

Panel B: Sample Statistics by Investor Type

	Owner-Managers	Others	Difference
	Mean	Mean	Mean
Market Cap in Rs M (6-monthly Average)	3,412.09	4,327.43	-915.34
Close Price (6-monthly Average)	60.46	108.60	-48.14***
Monthly Return (12-monthly Average) in %	1.60%	8.02%	-0.06
Annualized Volatility (scaled using daily volatility over past year) in %	63.19%	65.38%	-0.02
Annualized Garman-Klass Volatility in %	16.99%	17.90%	-0.01
Variance Ratio (monthly variance over scaled daily variance)	12.89	15.24	-2.35
EBITDA as percent of Income	12.95	17.69	-4.74**
PAT as percent of Income	-8.71	-7.61	-1.10
Total Assets in Rs M	12,128.43	7,019.45	5,108.98**
Net Fixed Assets in Rs M	3,539.86	1,584.68	1,955.18***
Debt Equity Ratio in multiples	2.61	1.62	0.99**
Average Daily Value Traded in Rs. M	16.76	24.47	-7.71
Amihud Illiquidity Ratio over previous month	6.58	5.85	0.73
Shares held by Owner-Managers in %	45.40	45.61	-0.21
Shares Pledged by Owner-Managers in %	18.53	8.69	9.84***
Price Path Ratio	1.06	1.18	-0.12
Preferential Allotment as % of Shares Outstanding (prev qtr)	17.27	29.31	17.27
Preferential Allotment as % of Owner-Manager Shares (prev qtr)	81.32	137.85	81.32
Preferential Allotment to All Owner-Managers in %	100.00	18.71	81.29***
Preferential Allotment to All Institutional Investors in %	1.63	22.82	-21.19***
Days from Announcement to First Board Meeting	2.68	2.34	0.34**
Days from Announcement to Issue	27.38	26.80	0.58

This table presents summary statistics (as shown in Table 2) by investor type and business group affiliation. Investor type can be owner-managers (if they subscribe to the entire preferential issue) or non-owner managers (if owner-managers either partially participate or do not participate at all in the preferential issue). Business group affiliation is determined by CMIE Prowess based on whether the firm is part of a business group owning multiple firms. * , ** and *** represent significance with 90% , 95% and 99% confidence respectively. Asterisks in the first two columns indicate that the cell value is significantly different from zero. In the column titled 'Difference' they indicate that mean difference between the two columns is significantly different from zero.

Panel C: Sample Statistics by Group Affiliation

	Group Affiliated Firms	Stand Alone Firms	Difference
	Mean	Mean	
Market Cap in Rs M (6-monthly Average)	7,834.12	2,014.22	5,819.90***
Close Price (6-monthly Average)	122.18	83.81	38.37***
Monthly Return (12-monthly Average) in %	5.88%	6.95%	-0.01
Annualized Volatility (scaled using daily volatility over past year) in %	62.22%	66.39%	-0.04
Annualized Garman-Klass Volatility in %	17.12%	18.02%	-0.01
Variance Ratio (monthly variance over scaled daily variance)	13.26	15.52	-2.26
EBITDA as percent of Income	16.70	16.56	0.14
PAT as percent of Income	-3.35	-10.44	7.09*
Total Assets in Rs M	17,080.66	3,116.50	13,964.16***
Net Fixed Assets in Rs M	4,049.65	872.50	3,177.15***
Debt Equity Ratio in multiples	2.39	1.54	0.85***
Average Daily Value Traded in Rs. M	43.35	11.02	32.33***
Amihud Illiquidity Ratio over previous month	3.84	7.26	-3.42***
Shares held by Owner-Managers in %	48.14	44.10	4.04***
Shares Pledged by Owner-Managers in %	13.44	9.48	3.96**
Price Path Ratio	1.13	1.17	-0.04
Preferential Allotment as % of Shares Outstanding (prev qtr)	20.71	29.92	-9.21
Preferential Allotment as % of Owner-Manager Shares (prev qtr)	71.55	155.57	-84.02***
Preferential Allotment to All Owner-Managers in %	43.32	33.62	9.70***
Preferential Allotment to All Institutional Investors in %	24.38	14.41	9.97
Days from Announcement to First Board Meeting	2.39	2.43	-0.04
Days from Announcement to Issue	27.35	26.69	0.66

Table 4: Determinants of Announcement Period Returns

Dependent Variable	**CAR [-1,+1]**	**CAR [-5,+5]**	**CAR [-10,+10]**	**CAR [-21,+21]**
Intercept	0.039757	0.012528	0.07244	0.305706
	(1)	(0.18)	(0.78)	(2.24)
Firm Characteristics				
Age (in years)	-0.00013	0.000125	0.000275	0.000634
	(-0.79)	(0.35)	(0.62)	(1.02)
Log Market Capitalization	-0.00974***	-0.01568***	-0.02581***	-0.04359***
	(-3.03)	(-2.74)	(-3.39)	(-3.83)
EBITDA (%)	0.000307**	0.000618***	0.000721**	0.001281***
	(2.63)	(2.76)	(2.19)	(2.87)
Debt-Equity (Multiple)	-0.00063	-0.00064	-0.00194	-0.00196
	(-0.84)	(-0.62)	(-1.37)	(-0.92)
Annualized volatility (%)	-0.03391	-0.07909**	-0.11655**	-0.27794***
	(-1.54)	(-2.01)	(-2.02)	(-3.38)
Prior Period CARs (-252, -30)	0.00064	0.0803***	0.200959***	0.476746***
	(0.06)	(3.89)	(7.24)	(11.62)
Owner-Manager's Equity (%)	0.00025	0.000403	0.00077	0.000789
	(1.44)	(1.14)	(1.6)	(1.17)
Institutional Equity (%)	-3E-05	0.000127	0.001872**	0.003091***
	(-0.08)	(0.19)	(1.98)	(2.69)
Owner-Manager's Pledging of Equity (%)	0.00043**	2.01E-05	0.000292	0.000848*
	(2.5)	(0.06)	(0.76)	(1.68)
Group Affiliation Dummy	0.013118**	0.023569∗	0.019033	0.030683
	(2.02)	(1.89)	(1.21)	(1.45)
Allotment Size as % of Total Equity	-9.4E-05	-0.00022	-0.00022	-0.00042
	(-0.88)	(-1.14)	(-0.87)	(-0.95)
Qualified Institutional Placement Dummy	-0.00554	0.007815	0.007692	-0.03483
	(-0.62)	(0.55)	(0.38)	(-1.32)
Owner-Manager Issuance Dummy	0.031045**	0.083643***	0.077728**	0.089859**
	(2.58)	(3.73)	(2.42)	(2.09)
Institution Issuance Dummy	0.011304	0.052556	0.046814	0.052293
	(0.89)	(1.65)	(1.27)	(1.14)
Price Path Dummy (=1 if high price path)	0.006745	0.081392*	0.112858	0.058398
	(0.25)	(1.78)	(1.79)	(0.62)
Price Path Dummy* Owner-Manager Issuance Dummy	-0.02902	-0.05987**	-0.04096	-0.01822
	(-1.83)	(-2.1)	(-1.06)	(-0.35)
Price Path Dummy*Institutional Issuance Dummy	-0.02019	-0.04934	-0.02165	-0.01472
	(-1.35)	(-1.42)	(-0.52)	(-0.28)
Price Path Dummy* Log Market Capitalization	0.005275	0.002315	0.001564	0.004777
	(1.59)	(0.4)	(0.21)	(0.42)
Owner Manager Issuance Dummy* Pledging Percent by Owner-Managers	-0.00053	-0.00048	-0.00015	-0.00073
	(-2.23)	(-1.08)	(-0.28)	(-1.07)
Year Dummies	YES	YES	YES	YES
R-square	0.0764	0.1443	0.2194	0.3676
Number of Observation	813	813	813	813

All coefficients are in units of 10^{-2}. T-statistics are in parentheses.

This table presents CARs (cumulative abnormal returns) around announcement of preferential issuances in the Indian market. CARs are computed using returns of the stock over and above returns predicted by a simple market model. Market model is estimated by regressing daily stock returns over market index returns (BSE 500, an index of top 500 stocks in the Bombay Stock Exchange, is used as the index) using data between 252 and 30 days prior to announcement. Four time windows (1 day, 5 days, 10 days and 21 days), anchored around the announcement date, are used to compute CARs. Results are presented for the overall sample as well as for eight sub-groups. Prior shareholding of owner-managers is based on ownership in the quarter immediately preceding the announcement date. Market capitalization is based on 6-month average prior to the announcement date. Volatility is daily close-to-close return standard deviation over a year multiplied by square root of 252. Debt-equity ratio is based on the latest annual financial statement prior to the announcement date. Investor type can be owner-managers (if they subscribe to the entire preferential issue) or non-owner managers (if owner-managers either partially participate or do not participate at all in the preferential issue). Business group affiliation is determined by CMIE Prowess based on whether the firm is part of a business group owning multiple firms. Issuance date is the date when shareholders approve PPL issuance in an AGM. We use 20 days post announcement as the issuance date as CMIE Prowess does not capture AGM dates. High price path firms are firms whose volume-weighted average price in the two weeks preceding issuance date is higher than the volume-weighted average price in the 26 weeks preceding issuance date. * ,**and *** represent significance with 90% , 95% and 99% confidence respectively. Asterisks in the first two columns indicate that the cell value is significantly different from zero. In the column titled 'Difference', they indicate that mean difference between the two columns is significantly different from zero.

Table 5: Determinants of Announcement Period Returns (CARs) after Controlling for Manipulation Possibilities

Dependent Variable	CAR [-1,+1]	CAR [-5,+5]	CAR [-10,+10]	CAR [-21,+21]
Intercept	0.054183	0.005001	0.05237	0.266532
	(1.4)	(0.07)	(0.55)	(1.94)
Firm Characteristics				
Age (in years)	-0.00015	0.000105	0.000304	0.000698
	(-0.93)	(0.29)	(0.69)	(1.12)
Log Market Capitalization	-0.00908***	-0.0144**	-0.02522***	-0.04088***
	(-2.71)	(-2.37)	(-3.21)	(-3.55)
EBITDA (%)	0.000273**	0.00059**	0.000719**	0.001294***
	(2.36)	(2.61)	(2.14)	(2.87)
Debt-Equity (Multiple)	-0.00066	-0.00056	-0.0018	-0.00199
	(-0.86)	(-0.55)	(-1.23)	(-0.89)
Annualized volatility (%)	-0.02528	-0.0857**	-0.12848**	-0.28632***
	(-1.09)	(-2.09)	(-2.15)	(-3.34)
Prior Period CARs (-252, -30)	0.002314	0.080611***	0.202974***	0.481738***
	(0.2)	(3.82)	(7.21)	(11.73)
Owner-Manager's Equity (%)	0.000221	0.000338	0.00069	0.000688
	(1.28)	(0.93)	(1.41)	(1.01)
Institutional Equity (%)	-0.00011	0.000117	0.002019**	0.003252**
	(-0.27)	(0.17)	(2.16)	(2.87)
Owner-Manager's Pledging of Equity (%)	0.000422**	-1.5E-05	0.000194	0.000747
	(2.51)	(-0.05)	(0.54)	(1.51)
Group Affiliation Dummy	0.012744**	0.023046*	0.017887	0.029211
	(1.98)	(1.84)	(1.13)	(1.38)
Allotment Size as % of Total Equity	-0.00012	-0.00025	-0.00024	-0.00041
	(-1.13)	(-1.27)	(-0.9)	(-0.89)
Qualified Institutional Placement Dummy	-0.00504	0.009973	0.016701	-0.02094
	(-0.55)	(0.7)	0.8	(-0.79)
Owner-Manager Issuance Dummy	0.027985**	0.083571***	0.080916**	0.097461**
	(2.46)	(3.81_	(2.51)	(2.25)
Institution Issuance Dummy	0.009388	0.054001*	0.050711	0.056302
	(0.75)	(1.68)	(1.37)	(1.22)
Price Path Dummy (=1 if high price path)	0.007929	0.083031*	0.103625	0.052021
	(0.3)	(1.76)	(1.56)	(0.53)
Price Path Dummy* Owner-Manager Issuance Dummy	-0.02642*	-0.06093**	-0.04736	-0.02939
	(-1.72)	(-2.2)	(-1.23)	(-0.57)
Price Path Dummy* Institutional Issuance Dummy	-0.01871	-0.05198	-0.02876	-0.02267
	(-1.27)	(-1.49)	(-0.69)	(-0.43)
Price Path Dummy* Log Market Capitalization	0.004735	0.002117	0.003526	0.007034
	(1.42)	(0.35)	(0.46)	(0.6)
Owner Manager Issuance Dummy*Pledging % by Owner-Managers	-0.00045**	-0.00037	-1.7E-05	-0.00063
	(-2.03)	(-0.89)	(-0.03)	(-0.96)
Annualized Garman-Klass Volatility	-0.08381	0.018504	0.084202	0.082989
	(-1.62)	(0.19)	(0.66)	(0.52)
Amihud Illiquidity Ratio over previous month	0.000183	0.000396	0.000329	0.000673
	(0.76)	(0.66)	(0.54)	(0.8)
Variance Ratio	0.000181	0.000658**	0.000934	0.000672
	(1.37)	(2.11)	(2)	(0.96)
Prior Period CAVs (-252, -30)	1.60E-06	2.18E-06	-5.87E-06	-1.6E-05***
	(0.72)	(0.55)	(-1.09)	(-2.7)
Year Dummies	YES	YES	YES	YES
R-square	0.08	0.15	0.23	0.37
Number of Observation	813	813	813	813

All coefficients are in units of 10^{-2}. T-statistics are in parentheses.

This table presents regression estimates for determinants of CARs (cumulative abnormal returns) using proxies for price manipulation in addition to all control variables used in Table 5. Amihud illiquidity measure is computed as the average ratio of return over value traded over the previous month. Variance ratio represents the ratio of monthly volatility over scaled daily volatility (daily volatility x square root of 21). Prior period CAVs (cumulative abnormal volume) represent CAVs over a 220 day window prior to the issuance date (252 days prior to 30 days prior). CAVs are computed similar to CARs using a market model with daily value traded of the stock and of the market (value traded in the entire Bombay Stock Exchange as reported in the exchange website). Results are reported for each of the CARs separately. All coefficients are in units of 10^{-2} except prior period CAV which is in units of 10^{-4}. T-statistics are in parentheses. $*$, $**$ and $***$ represent significance with 90% , 95% and 99% confidence respectively.

A Appendix 1

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 of 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.[13] 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,

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

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

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

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

[13]Note that $V_{0-}(s)$ should reflect the market's expectation of the hidden value (HV), conditional on the owner-managers' 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 (PA) are employed. Given that $t(s)$ arises from a uniform distribution over $(-H, H)$, the market's expectation of the hidden value (HV) is equal to $(Prob(t < 0)(E(t|OE) + (Prob(0 \leq t < \hat{t}(s))(E(t|RO) + (Prob(t \geq \hat{t}(s))(E(t|PA)$. 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 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 will be unwilling to pay anything more than $P_{0^-}(s)$. Since owner-managers will want to issue shares to outsiders at the highest possible price, the issue price will be set at $P_{0^-}(s)$, and Equation A.2 implies that,

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

after using the result in Equation 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:

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

Equation A.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 A.4 will be binding. Note that V_{-1} is given as follows (after using the result in Equation A.1):

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

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 A.4implies that the issue price is equal to $\frac{V_{0^-}(s=h)}{N} = \frac{[\frac{h}{2}+\frac{x+y}{2}-I]}{N}$. Equation A.4 implies that

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

If $s = l$, Equation A.4 implies that the issue price will be equal to the average price, which (after using the result in Equation A.5) is given by

$$\begin{aligned} P_{avg} &= \frac{V_{0^-}(s=l)+V_{-1}}{2N} \\ &= (\frac{1}{2N})(\frac{l}{2}+\frac{x+y}{2}-I)+\frac{1}{2N}(\frac{h+l}{4}+\frac{x+y}{2}-I) \\ &= \frac{[\frac{h+3l}{8}+\frac{x+y}{2}-I]}{N} \end{aligned} \tag{A.7}$$

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

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

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

$$f^{PA}(s) = \frac{I}{\frac{h+3s}{8}+\frac{x+y}{2}}, s = l, h \tag{A.9}$$

Note further that the SEBI-mandated issue price in a preferential allotment when $s = l$ is overvalued 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 A.7. Thus the SEBI regulation-induced additional premium paid by buyers in a preferential allotment is given by

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

A.1.4 Owner-managers' investment-financing decision

Owner-managers are endowed with the decision rights with regard to the preferential allotment decision. Thus, analyzing their wealth effects is critical

for understanding their decisions. The wealth effects depend on the owner-managers' information about the hidden value. Below we consider the wealth effects (of owner-managers) arising under the various financing alternatives. A comparison of the wealth effects under different financing alternatives helps us understand how the financing decision is related to information about the hidden value.

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 τ= +1. The owner-managers have to choose among three alternatives: (i) No Issue (*UI*): no shares are issued if the project is rejected, (ii) Outside Equity (*OE*): shares are issued to outsiders, and (iii) Preferential Allotment (*PA*): shares are issued to owner-managers.

Let $V^T(s, t)$ denote the long-run true value of the firm. It would be equal to the expected value of the assets-in-place (*AIP*), the expected cash flows on the investment opportunity and the expected hidden value (*HV*). In other words,

$$V^T(s,t) = \left(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}\right). \tag{A.11}$$

Case A (No Issue: *UI*)

Since the project is not undertaken, its NPV will not affect the long-run true value of the firm,and $V^T(s, t)$ in Equation (A.11) is reduced to $\left(\frac{s}{2} + \frac{t}{2}\right)$. Given that the owner-manager holds a fraction α of the firm, it follows that

$$W^{UI}(t,s) = \alpha\left(\frac{s}{2} + \frac{t}{2}\right) \tag{A.12}$$

Case B (Outside Equity: *OE*)

The owner-managers issue a fraction, f^{OE}, to outsiders. 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 of the long-run true value of the firm ($V^T(s, t)$). It follows that

$$W^{OE}(t,s) = \alpha(1 - f^{OE}(s))\left(\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}\right) \tag{A.13}$$

Case C (Rights Offering: *RO*)

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

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

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 to

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

Note that the fraction of the firm sold in te rights offering, and therefore, the issue price in the rights offering, are irrelevant because the net wealth gain of the owner-managers is independent of f^{RO}.

Case D (Preferential Allotment: *PA*)

Preferential allotments can be subscribed fully by owner-managers or fully by institutional investors or partially subscribed by both owner-managers and institutional investors. We consider the general case in which the financial constraints of owner-managers is captured by the parameter γ, which reflects the fraction of the investment I that is financed by the owner-manager (with the remaining fraction, $1 - \gamma$, being financed by an institutional investor). A pure owner-manager preferential allotment occurs when $\gamma = 1$, a pure institutional owner preferential allotments occurs when $\gamma = 0$, and a joint preferential allotment occurs when $0 < \gamma < 1$.

Let $f^{PA}(s)$ denote the fraction of the firm that has to be sold in the preferential allotment. 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, $\alpha(1 - f^{PA}(s))$, of the long-run true value of the firm ($V^T(s,t)$). In addition, they are also entitled to a fraction, $\gamma f^{PA}(s)$, 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 (γI) and this shows up as a negative cash flow:

$$W^{PA}(t,s) = \left[\alpha(1 - f^{PA}(s)) + \gamma f^{PA}(s)\right]\left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2}\right] - \gamma I \tag{A.16}$$

If $W^{PA|II}(s,t)$ represents the wealth effects of the preferential allotment for the institutional investor, individual rationality requires $W^{PA|II} \geq 0$, as shown below.

$$W^{PA|II}(s,t) = (1-\gamma)f^{PA}(s)V^{T}(s,t) - (1-\gamma)I \geq 0 \tag{A.17}$$

Using the expressions for $f^{PA}(s)$ and $V^{T}(s,t)$ in Equations (A.9) and (A.11), respectively, it follows that the individual rationality condition of institutional investors reduces to

$$t \geq \hat{t}(s) = \frac{h-s}{4}. \tag{A.18}$$

Owner-Managers' Incentivesw

We will consider the owner-manager's incentive to invest in the project as opposed to the choice of underinvesting in the. project. Once we derive the conditions for investing, we will consider the tradeoff between different financing alternatives. The owner manager's incentive to invest depends on the opportunity cost of under investing. The owner manager will invest only if $W^{PA} > W^{UI}$. Using the results in Equations (A.12) and (A.16), it follows that

$$(\gamma-\alpha)\frac{I}{(\frac{h+3s}{8}+\frac{x+y}{2})}.(\frac{s}{2}+\frac{x+2}{2}+\frac{t}{2}) \geq (\gamma-\alpha)I - \alpha NPV \tag{A.19}$$

There are three cases: (i) $\gamma = \alpha$, (ii) $\gamma > \alpha$, (iii) $\gamma < \alpha$

Case (i): $\gamma = \alpha$

In this case, Equation (A.19) reduces to $0 \geq -\alpha NPV$, which always holds.

Case (ii): $\gamma > \alpha$

In this case, Equation (A.19) reduces to

$$t \geq \frac{h-s}{4} - (\frac{2NPV}{I})(\frac{1}{1-\frac{\gamma}{\alpha}}).(\frac{h+3s}{8}+\frac{x+y}{2}). \tag{A.20}$$

Case (iii): $\gamma < \alpha$

In this case, Equation (A.19) reduces to

$$t \leq \frac{h-s}{4} + (\frac{2NPV}{I})(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3s}{8} + \frac{x+y}{2}) \tag{A.21}$$

Now we combine the constraints imposed on t in Equation (A.18) and Equation (A.20) to get the condition for a private placement under $\gamma \geq \alpha$.[14] Further, note that the second term in equation (A.20) is always negative, given that $NPV > 0$, $1 - \frac{\gamma}{\alpha} > 0$ and $\frac{h+3s}{8} + \frac{x+y}{2} > 0$. In other words, the right hand side of equation (A.20) is always strictly less than or equal to $(\frac{h-s}{4})$.It follows that the restriction on t for a preferential allotment is given by $t \in [\frac{h-s}{4}, H]$.
In a similar manner, combining equation (A.18) and equation (A.21), we get the restriction on the value of t for a joint preferential allotment under the case with $\gamma > \alpha$. It follows that $t \in [\frac{h-s}{4}, \frac{h-s}{4} + (\frac{2NPV}{I})(\frac{1}{1-\frac{\gamma}{\alpha}}).(\frac{h+3s}{8} + \frac{x+y}{2})]$.

The two cases can be collapsed into a single case with the restriction that $t \in [\hat{t}(s), \bar{t}(s)]$, where

$$\hat{t}(s) = \frac{h-s}{4} \tag{A.22}$$

$$\bar{t}(s) = \frac{h-s}{4} + \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8} + \frac{x+y}{2}) \tag{A.23}$$

Finally, since institutional investors are necessarily involved in the preferential allotment (except in the case when $\gamma = 1$), their individual rationality condition for participating in the preferential allotment, as given in Equation (A.18), matters. Even in the $\gamma = 1$ case, owner-managers employ the same cutoff for participating in the preferential allotment. The following table provide the values of t over which the preferential allotment will be offered under different situations.

[14]The constraint in the case with $\gamma = \alpha$ always holds for any value of t and therefore this case is combined with the $\gamma > \alpha$ case without loss of generality.

Table 6: Final

γ	s	$t \in [\hat{t}(s), \bar{t}(s)]$
$\gamma \geq \alpha$	$s = h$	$t \in [0, H]$
$\gamma \geq \alpha$	$s = l$	$t \in [\frac{h-l}{4}, H]$
$\gamma < \alpha$	$s = h$	$t \in [0, \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h}{2} + \frac{x+y}{2})]$
$\gamma < \alpha$	$s = l$	$t \in [\frac{h-l}{4}, \frac{h-l}{4} + \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8} + \frac{x+y}{2})]$

A.1.5 Proof of Corollary 1

The announcement effects of the preferential allotment should reflect the information revealed about the hidden value (HV). 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 $E[t]$, which itself depend on the conditional expectation of t, as given by $E[t|s, \gamma]$. The following table shows a 2X2 map of the conditional expectations required under different scenarios.

Table 7: Hidden Value

	s=l	s=h	
$\gamma < \alpha$	$E[t\|_{s=l,\gamma<\alpha}]$	$E[t\|_{s=h,\gamma<\alpha}]$	Eq. (**??**)
	Eq. (**??**)	Eq. (**??**)	
$\gamma \geq \alpha$	$E[t\|_{s=l,\gamma\geq\alpha}]$	$E[t\|_{s=h,\gamma\geq\alpha}]$	Eq. (**??**)
	Eq. (**??**)	Eq. (**??**)	
	Eq. (**??**)	Eq. (**??**)	

A.1.6 Conditional Expectation of Hidden Value

$$\begin{aligned} E[t|_{s=l,\gamma<\alpha}] &= \frac{1}{2}\frac{\hat{t}(l)+\bar{t}(l)}{2} + \frac{1}{2}.0 \\ &= \frac{1}{4}\frac{\hat{t}(l)+\bar{t}(l)}{2} \\ &= \frac{1}{4}[\frac{h-l}{4} + \frac{h-l}{4} + \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8} + \frac{x+y}{2})] \end{aligned} \tag{A.24}$$

$$\begin{aligned} E[t|_{s=h,\gamma<\alpha}] &= \frac{1}{2}\frac{0+\bar{t}(h)}{2} + \frac{1}{2}.0 \\ &= \frac{\bar{t}(h)}{4} \\ &= \frac{1}{4}[\frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h}{2} + \frac{x+y}{2})] \end{aligned} \tag{A.25}$$

$$\begin{aligned} E[t|_{s=l,\gamma\geq\alpha}] &= \frac{1}{2}[\frac{\frac{h-l}{4}+H}{2}] + \frac{1}{2}.0 \\ &= \frac{h-l}{16} + \frac{H}{4} \end{aligned} \tag{A.26}$$

$$\begin{aligned} E[t|_{s=h,\gamma\geq\alpha}] &= \frac{1}{2}[\frac{0+H}{2}] + \frac{1}{2}.0 \\ &= \frac{H}{4} \end{aligned} \tag{A.27}$$

Finally,

$$\begin{aligned} E[t|_{\gamma\geq\alpha}] &= Prob(s=h)E[t|_{t=h,\gamma\geq\alpha}] + Prob|_{s=l}E[t|_{t=l,\gamma\geq\alpha}] \\ &= \frac{1}{2}\frac{H}{4} + \frac{1}{2}(\frac{h-l}{16} + \frac{H}{4}) \\ &= \frac{H}{4} + \frac{h-l}{32} \end{aligned} \tag{A.28}$$

In a similar vein,

$$\begin{aligned}E[t|_{\gamma<\alpha}] &= Prob(s=h)E[t|_{t=h,\gamma\geq\alpha}] + Prob|_{s=l}E[t|_{t=l,\gamma<\alpha}] \\ &= \frac{1}{2}\frac{NPV}{2I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h}{2}+\frac{x+y}{2}) + \frac{1}{2}[\frac{h-l}{4} + \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8}+\frac{x+y}{2})] \\ &= \frac{h-l}{8} + \frac{NPV}{4}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{5h+3l}{8}+x+y) \qquad \text{(A.29)}\end{aligned}$$

Further,

$$\begin{aligned}E[t|_{s=h}] &= Prob(\gamma<\alpha)E[t|_{s=h,\gamma<\alpha}] + Prob(\gamma\geq\alpha)E[t|_{s=h,\gamma\geq\alpha}] \\ &= Prob(\gamma<\alpha)\frac{NPV}{2I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h}{2}+\frac{x+y}{2}) + Prob(\gamma\geq\alpha)\frac{H}{4} \geq 0 \qquad \text{(A.30)}\end{aligned}$$

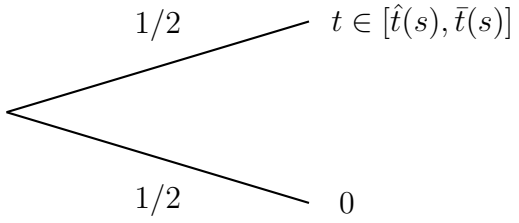
And,

$$\begin{aligned}E[t|_{s=l}] &= Prob(\gamma<\alpha)E[t|_{s=l,\gamma<\alpha}] + Prob(\gamma\geq\alpha)E[t|_{s=l,\gamma\geq\alpha}] \\ &= Prob(\gamma<\alpha)[\frac{h-l}{4} + \frac{NPV}{2I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8}+\frac{x+y}{2})] + Prob(\gamma\geq\alpha)[\frac{h-l}{16}+\frac{H}{4}] \geq 0 \qquad \text{(A.31)}\end{aligned}$$

We can combine the two cases $(\gamma < \alpha)$ and $(\gamma \geq \alpha)$ discussed in proposition 1 into the following rule for private placements, i.e, private placements will be made for all $t \in (\hat{t}(s), \bar{t}(s))$, where

$\hat{t}(s) = \frac{h-s}{4}$

$\bar{t}(s) = \frac{h-s}{4} + \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8}+\frac{x+y}{2})$



Therefore,

$$E[t|_{s,\gamma}] = \frac{1}{2}\frac{\hat{t}(s) + \bar{t}(s)}{2} + \frac{1}{2}.0$$
$$E[t|_{s,\gamma}] = \frac{\hat{t}(s) + \bar{t}(s)}{4} \tag{A.32}$$

Corollary 1(ii) follows from differentiating the expression for $\hat{t}(s)$. Corollary 1(iii) follows immediately from the differentiation of the announcement period return.

Using the above results, we can populate the following 2X2 table

Table 8: Hidden Value

	s=l	s=h	
$\gamma < \alpha$	$\frac{h-l}{4} + \frac{2NPV}{I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8} + \frac{x+y}{2})$	$\frac{NPV}{2I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h}{2} + \frac{x+y}{2})$	$\frac{h-l}{8} + \frac{NPV}{4}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{5h+3l}{8} + x + y)$
$\gamma \geq \alpha$	$\frac{h-l}{16} + \frac{H}{4}$	$\frac{H}{4}$	$\frac{H}{4} + \frac{h-l}{32}$
	$= Prob.(\gamma < \alpha).[\frac{h-l}{4} + \frac{NPV}{2I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h+3l}{8} + \frac{x+y}{2})] + Prob(\gamma \geq \alpha)[\frac{h-l}{16} + \frac{H}{4}] \geq 0$	$Prob.(\gamma < \alpha).\frac{NPV}{2I}(\frac{1}{1-\frac{\gamma}{\alpha}})(\frac{h}{2} + \frac{x+y}{2}) + Prob(\gamma \geq \alpha)\frac{H}{4} \geq 0$	

B ONLINE APPENDIX

In this online appendix, we provide two extensions of the model. First, we incorporate manipulation possibilities into the model. Second, we consider the implication of asymmetry of information about assets-in-place.

B.1 Modeling Manipulation Possibilities

From an economic growth perspective, preferential allotments to owner-managers are a positive institutional arrangement. However, the price at which these shares are issued to insiders is critical because owner-managers may have incentives to manipulate share prices (in order to issues shares to themselves at a discount to their true value). Mechanisms such as the SEBI-mandated issue price regulations try to 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 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' welfare. The fact that SEBI has put 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.

Below we sketch a simple formulation of manipulation in the context of our basic model, where owner-managers can bring down the price level per share (before announcing the preferential allotment) by an amount w.[15] 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 manipulate stock prices downward (i.e., increase w)

[15]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)]. 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. 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). In the setting of our model, the type of manipulation is not directly relevant; all that matters is that the manipulation causes the price to move the direction desired by the owner-managers, and away from its fundamental value.

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 from above due to such costs. Even within this upper limit, beyond which the costs of manipulation exceed the benefits, 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 through an exogenously specified optimization exercise. We discuss the details of such an optimization exercise in the next (sub)subsection below.

B.2 Manipulation Model

For ease of exposition, we focus on private placements to owner-managers and outside equity, but preclude rights offerings and institutional financing. The conclusions form this section are robust to including these alternatives. 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 A.13-**??** depend on f^{OE} and f^{PA}, as stated in Equations A.3 and **??**, respectively. These quantities change because of the dip in price by the amount w, as shown below.

$$f^{OE}(s) = \frac{I}{\frac{s}{2} + \frac{x+y}{2} - w} \tag{B.33}$$

$$f^{PA}(s) = \frac{I}{\frac{h+3s}{8} + \frac{x+y}{2} - w} \tag{B.34}$$

With the above modifications in $f^{PA}(s)$ and $f^{OE}(s)$, the cutoffs in a world

of manipulation are determined in exactly the same way as before, namely, by comparing Equations **??**-**??** 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 $w = w^*$ 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 will hurt owner-managers if they then observe a low realization of the hidden value (t) because it will trigger an outside equity issue at a less than favorable price. The low issue price 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 they then observed a high realization of t because this would trigger a preferential issue. Owner-managers would 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 will balance these tradeoffs (subject to the usual boundary conditions - in this case $w < l$ in order to ensure positive price levels). The optimization objective is given below.

$$Prob(s = l)\left[\int_{-H}^{\hat{t}^{OE-PA}(s=l)} W^{OE}(t, s = l; w)dt + \int_{\hat{t}^{OE-PA}(s=l)}^{H} W^{PA}(t, s = l; w)dt\right]$$
$$+Prob(s = h)\left[\int_{-H}^{0} W^{OE}(t, s = h; w)dt + \int_{0}^{H} W^{PA}(t, s = h; w)dt\right]$$

B.3 Information asymmetry in both assets-in-place and investment opportunities

[16]

We now consider the standard Myers and Majluf (1984) setup where information asymmetry applies to both the assets-in-place and 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 **??** stays unchanged, but Equations A.13 and **??** are modified to the equations below:

$$W^{OE}(t,s) = \alpha(1 - f^{OE}(s)) \left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2} + \frac{q}{2}\right] \tag{B.35}$$

$$W^{PA}(t,s) = \left[\alpha(1 - f^{PA}(s)) + f^{PA}(s)\right] \left[\frac{s}{2} + \frac{x+y}{2} + \frac{t}{2} + \frac{q}{2}\right] - I \tag{B.36}$$

Now, comparing Equation B.35 with Equation **??** 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):

$$q > \frac{f^{OE}(s)}{1 - f^{OE}(s)} t + \left[\frac{f^{OE}(s)}{1 - f^{OE}(s)} s - (x+y)\right] \tag{B.37}$$

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 an outside equity issue (OE) to underinvesting in the project (UI) and vice versa.

Comparing Equation **??** with Equation B.36, we can solve for the boundary that defines the regions of (q, t) in which the owner-managers prefer the preferential allotment choice (PA) to the underinvestment choice (UI). The boundary is given by

$$q > \frac{1}{\alpha + f^{PA}(s)(1-\alpha)} \left(-f^{PA}(s)(1-\alpha)t + \left[2I - f^{PA}(s)(1-\alpha)s\right]\right) - (x+y) \tag{B.38}$$

[16] In this section, we ignore the institutional investor alternative.

Again, the right hand side of Equation B.38 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 B.35 with Equation B.36 to determine the regions of (q, t) in which the preferential allotment alternative (PA) is preferred to outside equity (OE). It can be shown that the boundary is defined by

$$q > -t + \left[\frac{2I}{\alpha(f^{OE}(s) - f^{PA}(s)) + f^{PA}(s)} - (s + x + y)\right] \tag{B.39}$$

The right hand side of Inequality B.39 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 $s = h$.

Equations B.37, B.38 and B.39 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 have three lines defining the dominance regions of RO versus UI, RO versus PA, 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 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 PA, PA 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 regarding the NPV of the project. (The lower bound ensures that the manager considers only positive NPV projects.) Thus, the underinvestment situation will arise only in the area spanned by the curved arrow shown in the graph. In this region of (q,t), the manager prefers underinvest. 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.

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 $= 0.25$.)

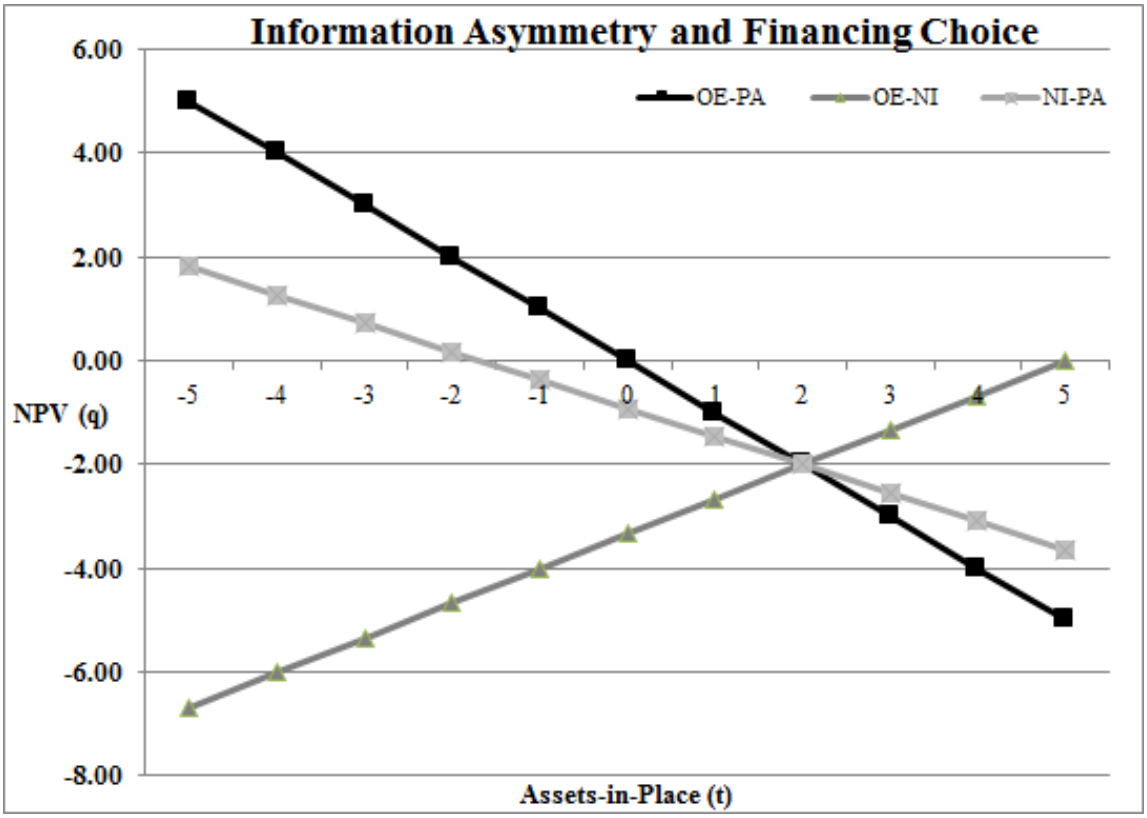


Figure 6: **Asymmetry of information and the firm's financing decision**

B.4 Timeline of SEBI Guidelines

- 1. Summary
  - a. Until Aug 1994, no guidelines on PPL issuances
    - 1. Promoters issued shares to themselves at very low prices
  - b. SEBI issues first guidelines in August 1994
  - c. Price set as average of 6 months prices
  - d. Allotment must happen within 3 months from AGM resolution
  - e. Lock in period = 5 years
  - f. GOI with RBI had guidelines for raising foreign equity through PPL in June 1994 (pricing was different from SEBI guidelines until rationalized in April 1995)
  - g. First amendment in 1997
  - h. Lock in period lowered to 3 years
  - i. Second amendment in 1998
  - j. Cap of not more than 20
  - k. Consolidated guidelines issued in 2000 (Chapter XIII of DIP guidelines)
  - l. Until September 2002, PPL were exempt from SEBI Takeover guidelines (i.e. change in management can happen through PPL without making open offers). After Sep 2002, anyone with 15% or more increase in shareholding will need to make an open offer under SEBI Takeover guidelines.
- 2. Eligibility for the preferential issue: Only those owners who have not sold shares in the 6 months before the relevant date are eligible to get PPL. (Previously, promoters used to sell shares in the open market after a bull run and then issue PPL at the 6 month average, which is lower).

- 3. Pricing of the preferential issue: Governed by the SEBI Disclosure and Investor Protection Guidelines (DIP) of 2000
  - a. Amended on July 10, 2007
  - b. For shares:
    - i. Higher of the two:
      - 1. Average of the High and Low closing prices during 6 months before the relevant date
      - 2. Average of the High and Low closing prices during 2 weeks before the relevant date
      - 3. (After Aug 2004), closing prices are replaced with daily VWAP
    - ii. Relevant date = 30 days before the AGM date when PPL is considered
  - c. For warrants:
    - i. Same as above except in the definition of relevant date
    - ii. Relevant date = either of 30 days before the AGM date when PPL issue of warrants was considered OR 30 days before the date when warrants are eligible for conversion
    - iii. AGM resolution must mention the choice of the option for relevant date and specify the relevant date which will be used for computing the price clearly.
    - iv. (until April 2009) 10% of the price determined using AGM date option (average of High and Low over 6 months OR 2 weeks before relevant date based on AGM (30 days before AGM resolution) must be paid on allotment.
      - 1. If promoter gets PPL shares, she pays 100% while if she gets warrants she pays 10% on allotment (later made to 25% from April 2009)
      - 2. This 10% is non-refundable if warrants are not exer-

cised

· 3. Warrants are valid for 18 months from issuance

* v. (After April 2009) 25% of the price has to be paid upfront.

* vi. (After Jan 2012), pricing based on 26 weeks and not 6 months before relevant date. d. Pricing is from the stock exchange that had the highest volume in the 6 months before relevant date

– e. For infrequently traded shares, firm needs to give a valuation certificate signed by a CA/merchant banker.

- 4. Lock-in provisions:

  – a. All issuances under PPL are subject to lock-in for 3 years from allotment (subject to a cap of 20

  – b. Lock in for shares obtained through conversion of warrants are 3 years from the date of allotment of the original warrants and not from the date of conversion.

  – c. Upon PPL issuance, the entire shareholding (including non-PPL shares owned) of allottees are locked in from the relevant date up to 6 months from PPL allotment.

- 5. Completion of allotment:

  – a. Allotment of shares under PPL authorized through AGM resolution must be completed within 15 days of AGM date. If not done within 15 days, a fresh resolution must be obtained (postal ballot is ok). Before April 8, 2004, this time period was 3 months from AGM.

    * i. 2001 – April 2004: 3 months from AGM

    * ii. April 2004 – 2017: 15 days from AGM

  – b. Entire value of PPL must be paid up by allottees at the time of allotment

- 6. Multiple issuances:

  - a. There could be multiple types of issues (PPL, PPL-QIP, Convertible warrants) announced in a single AGM. All of these issues will have the same announcement date but with same or different issue dates.

  - b. There could be multiple installments of the same issue spread over different days. That is, a single announcement can be followed by issue/allotment of shares on multiple days.

- 7. Re-distribution of shares between owners (leading to negative allocations): PPL issuances can be combined with re-distribution of shares between owner categories. That is, there could be a fresh issue of shares as well as a transfer of shares from an existing owner group to another owner group.

B.5 A typical PPL allotment process

- 1. Expression of Intent to allot PPL: The firm informs the exchange that it intends to issue PPL and a Board Meeting has been called to discuss the same. This is the first time when news about upcoming action hits the market. We call this action "Announcement of PPL issue" and the associated date the "Announcement Date".

- 2. Board Meeting: Subsequeappointed date as informed to the exchange, the Board of Directors meet to discuss the PPL issuance. We call this date as "Board Meeting Date" in our sample. SEBI mandates that for important events like PPL, the notification of the carry through motion has to happen within 30 minutes of the completion of the meeting . Should the resolution carry, it is put to vote through an Annual/Extraordinary General Body Mently, on an eting (A/EGM) or Postal Ballot.

- 3. Information on A/EGM or Postal Ballot to Exchange: Subsequent to the board meeting, where the resolution has carried through, the firm decides on when to call for an A/EGM or take the postal ballot route and informs the same to the exchange. This information is not captured in the Prowess Database.

- 4. Result of A/EGM or Postal Ballot: The result of the A/EGM or postal ballot is notified to the exchange either on the date of A/EGM or when the ballot counting is done as the case may be. This is the

date from which the relevant date (=AGM date – 30 days) for the SEBI-mandated price band computation is determined. However, it is not available in Prowess.

- 5. Call of Board Meeting post A/EGM or Postal Ballot: If the resolution carries in the A/EGM, the firm next informs the exchange of a call for Board Meeting to allot the PPL

- 6. Board Meeting: The board affirms the resolution of the A/EGM and allots the PPL to the said parties

- 7. Issuance of PPL: This is when the PPL is officially registered and included in exchanges information (ex-date for PPL) and is available in the Prowess Database. In a number of cases, it happens to be the same day as (6) above. We call this the "Issue Date" in our sample