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Transparent bookbuilding, certification and initial public offerings ☆

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ABSTRACT

India has the unique distinction of being the only country that releases information on the IPO bookbuilding process live to investors. Against this backdrop, we investigate the role this mechanism plays in generating investor interest during the bookbuilding process and the subsequent performance of IPOs in the immediate aftermarket. We show that, to retail investors, institutional bids in the early days of the bookbuilding process offer a coherent signal about the quality of the IPO. IPOs with high levels of institutional demand in the early days of the book also see high levels of bids from retail investors in the later days of the book. Large subscriptions have a strong positive effect on initial returns. Known certification mechanisms, such as the reputation of the sponsor, VC affiliation and IPO grading, are of limited importance in the Indian IPO market.

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1. Introduction

Though bookbuilding has emerged as one of the dominant methods of pricing and selling initial public offerings (IPOs) around the world, there is still considerable debate about the strengths, weaknesses, and future of this process. Jagannathan and Sherman (2005) highlight the problem of exclusivity and the lack of transparency in the current bookbuilding practice.[1] Wilhelm (2005) forecasts that advances in communication technology and auction theory will reshape the future of the bookbuilding process. In this paper, we contribute to this current debate by documenting the case of an emerging market, India, where the IPO bookbuilding process has indeed been reshaped. We study the benefits of this modified bookbuilding process for investors, especially retail investors, and its consequent impact on the underpricing of IPOs.

IPOs are characterized by high levels of information asymmetry. Firms that plan to go public often use various certification mechanisms, such as high-quality underwriters and venture capital (VC) affiliations, to reduce information asymmetry and signal their quality to potential investors. Past research has studied the impact of these certification mechanisms on the pricing of IPOs, mostly in developed markets.[2] It is only recently that the focus has shifted to developing markets such as India. In a recent paper, Deb and Marisetty (2010) document an interesting certification mechanism in Indian IPOs, namely IPO grading. They report that its introduction has resulted in a reduction in underpricing and that higher IPO grades lead to increased demand from retail investors.[3] However, Jacob and Agarwalla (2012) find no evidence of an improvement in IPO pricing as a result of the introduction of grading, and suggest that IPO grading has failed as a certification mechanism for Indian IPOs. This conclusion has been reiterated by the Indian stock market regulator SEBI, which has recently acknowledged that IPO grading has "not served the purpose that it was supposed to."[4] The results of our study may provide an explanation for this failure. We show that the announcement of an IPO grade is followed by a transparent bookbuilding process. IPO certification (or the lack of it) emanating from strong (or weak) institutional investor demand in the early days of the bookbuilding process renders IPO grades irrelevant for retail investors.

The IPO process in India has evolved over the last two decades and, as compared to the U.S. situation, it differs in at least three ways [for a detailed analysis of the institutional setting and regulatory framework, see Bubna and Prabhala (2011)]. First, since May 2007, the Indian regulations have required all IPOs to be graded by at least one credit rating agency. IPO grading was mandated primarily to protect retail investors from unscrupulous issuers. Second, 35% of the shares sold in Indian IPOs are reserved for retail investors.[5] This makes retail investors an important investor class for the issuing firms. Third, since 2006, the Indian IPO bookbuilding process has been extraordinarily transparent, in that the timing and subscription pattern for the different investor groups is observable on the stock exchange′s website, with 'live' updates every thirty

[1] Jagannathan and Sherman (2005) advocate applying certain transparency features of standard auctions (such as the timing of bids) to the bookbuilding process. They refer to this as a hybrid solution or modified bookbuilding. Jagannathan and Sherman also recommend that retail investors should be encouraged to participate in the bookbuilding process without the discouragement of institutional investors.

[2] For example, for U.S. IPOs, Beatty and Ritter (1986) and Carter, Dark, and Singh (1998), among others, show that IPOs with highly reputable underwriters show lower initial returns. Barry, Muscarella, Peavy, and Vetsuypens (1990) and Megginson and Weiss (1991) show that venture capitalist (VC)-backed IPOs exhibit lower initial returns.

[3] There have been some other recent studies on Indian IPOs. Bubna and Prabhala (2011) examine bidding, allocation, and underpricing in Indian IPOs in two situations: when underwriters had allocation powers and when such discretion was removed. Their results support bookbuilding theories in which discretionary allocation powers for underwriters assist with pre-market price discovery. Neupane and Poshakwale (2012) focus on the returns retail investors make in Indian IPOs. They find that retail investors can earn high first-day returns in IPOs with above-average demand from institutional investors. Brooks, Mathew, and Yang (in press) show that when-issued trading plays an important role in price discovery in the Indian IPO market.

[4] 'IPO grading has not served the purpose', The Indian Express (May 29, 2013). Available at www.indianexpress.com/news/ipo-grading-has-not-served-the-purpose-sebi/1122038.

[5] A few other countries, such as Italy and Germany, have a similar arrangement (Vismara, Paleari, and Ritter, 2012; Gounopoulos and Hoebelt, 2013).

minutes.[6] This unique insight allows investors to track the subscription patterns of different types of investors during the bookbuilding exercise.

The focus of our paper is on the transparency of the Indian bookbuilding process. We argue that an early and strong institutional demand can be interpreted as an IPO certification, especially by relatively uninformed retail investors.[7] We can think of at least two motives for institutional investors to reveal their demand in high-quality IPOs in the early days of the bookbuilding process. First, by revealing their bids early, institutional investors help to attract media and general attention to an IPO, which in turn helps to attract retail investors. Second, in the spirit of Chemmanur and Krishnan (2012), a strong demand from institutional investors in the early days of the bookbuilding process will make retail investors more optimistic about the future prospects of the IPO and entice them to participate (Paleari and Vismara, 2007). This optimism from retail investors will increase the heterogeneity in investors' beliefs and may lead to higher valuations, not only at the time of the IPO but also in the immediate aftermarket. Higher aftermarket prices could bring higher flipping profits for the selling institutional investors (Chemmanur, He, and Hu, 2009).

Using the day-by-day bookbuilding data for a sample of Indian IPOs, we find that transparent books benefit retail investors. These investors observe the initial demand from the more informed institutional investors before making their bids on the penultimate or last day of the bookbuilding process. IPOs in which institutional investors show a high level of interest (through a higher subscription level) in the early stages of the bookbuilding process also see a high level of retail subscription in the later stages. A high level of retail subscriptions has a strong positive effect on initial returns. Our regression results show that, to retail investors, early institutional bids are more informative than the IPO grade. Institutional investors show a stronger demand in high-grade IPOs whereas, for the retail investors, the only certification mechanism that is relevant is the institutional demand in the early days of the bookbuilding process. Other documented certification mechanisms, such as VC affiliation and underwriter reputation, do not matter in Indian IPOs.

The contribution of our paper to the IPO literature is twofold. First, we show that India, an emerging economy, has implemented a highly transparent, modified form of the bookbuilding process, and that such transparency is beneficial to investors. Second, we extend the current literature on new IPO certification mechanisms by showing that, to the retail investors in India, the transparency of the book provides a stronger signal than the IPO grade.

The rest of the paper is structured as follows. In Section 2, we discuss the IPO bookbuilding process in India. Section 3 presents our testable hypotheses. In Section 4, we describe our data and methodology, while in Section 5 we present our results. Section 6 concludes.

2. Preparing a firm for an IPO in India

When planning IPOs in India, firms undergo the usual preparations, such as hiring advisers, and drafting the prospectus and application to the stock exchange. As discussed above, two interesting aspects of the Indian IPO process stand out: the compulsory grading of IPO firms and the transparency of the bookbuilding process. Deb and Marisetty (2010) provide details of the IPO grading regulation in India. Below, we discuss the Indian IPO bookbuilding process in greater detail.

The IPO firm's underwriter first files a draft offer document with the regulator. This is called the Draft Red Herring Prospectus. A Draft Red Herring Prospectus contains all the vital information on the firm except for the price band and the number of shares to be sold. The firm simultaneously files a listing application with the stock exchanges (the Bombay Stock Exchange, BSE, or the National Stock Exchange, NSE, or both).[8] The underwriter and the firm then go on road shows that are mostly attended by institutional investors. It is during the course of these road shows that the underwriter

[6] We are aware of only one other country with a slightly similar arrangement: in South Korea, information on the demand from institutional investors and the weighted average of their bids is disclosed in the follow-on prospectus (Joh and Kim, 2011).

[7] Along with the issuing firms and their underwriters, institutional investors too are aware of the importance of the participation of Indian retail investors for an IPO to be successful.

[8] The two main exchanges in India are the NSE and the BSE. There are 20 regional stock exchanges but the trading activity in them is very low. The BSE became a fully demutualized corporate entity on August 19, 2005. It is one of the oldest exchanges

will make a decision about the pricing band. After the band has been finalized, the underwriter files the final Red Herring Prospectus (RHP) with the regulator. This prospectus contains the price band and details on how the bookbuilding exercise would be conducted, clearly outlining the responsibilities of the various players involved like the Book Running Lead Manager (BRLM), the firm, the selling shareholders, underwriters, applicants (bidders), registrars, and banks. The RHP often contains illustrative examples on the process of book building and price discovery.

The Indian regulatory setup divides investors into three categories, and the allocation tranches of these categories are pre-defined. Institutional investors (known as qualified institutional buyers or QIBs) are allocated no more than 50% of the offered shares. Non-institutional investors (NIIs), defined as individuals investing more than Indian Rupee (INR) 100,000 in the issue, are allocated 15% of the offered shares. Retail investors, who can invest up to a maximum of INR 100,000 have to be allocated no less than 35% of the offered shares.[9] In our study, we focus on the bidding behavior of institutional and retail investors (and ignore NIIs)[10] as they form the two extremes of the spectrum of financial literacy.

In the last decade, there have been a number of regulatory changes in the Indian IPO process. In 2003, bookbuilding was made compulsory for certain firms. In 2005, underwriters' discretionary allocation power was removed and the bookbuilding process was made transparent.[11] While the regulator asked for the bookbuilding process to be made transparent in 2005, it was only on April 1, 2006 that this rule came into practice. In 2007, IPO grading was introduced in India.[12] Grades are expected to provide potential investors with an independent, reliable, and consistent assessment of the fundamentals of the IPO firm. They usually reflect an assessment of the IPO firm's business prospects, financial position, management quality, and corporate governance.

Since 2006, the bookbuilding process in India has been extraordinarily open. For every IPO, the stock exchange shows a 'live' book with updates every half hour, mandated by regulation. The stock exchange website shows how many shares have been applied for against each of the investor categories and the percentage of the issue that has been subscribed to. Bids placed by investors can be modified during the bookbuilding period but cannot be withdrawn.[13] At the close of each bookbuilding day, the website shows the cumulative bids for all categories of investors at their respective prices. Hence, the timing and subscription patterns for the different investor groups are observable during the bookbuilding period. This attribute of the Indian IPO market allows investors to use online real-time information to decide on their subscriptions while the book is being built. Such an arrangement stands in contrast to the bookbuilding exercise in the U.S. and European markets, where such detailed information about the book is almost never made public. The defining characteristic of the Indian IPO bookbuilding process is therefore its transparency.

As an example of the bidding information available during the bookbuilding process, we discuss the case of Omnitech InfoSolutions Ltd., which conducted its IPO on August 14, 2007. The firm provides IT solutions and technology services. Omnitech issued 3.33 million shares, priced at INR 105 each. The bookbuilding for the issue started on the July 19, 2007 and ended on July 25, 2007. By the end of the bookbuilding process, the issue was heavily oversubscribed by both institutional and retail investors. Table 1 provides details of the day-by-day build-up of demand from the institutional (QIBs) and retail investors. The table shows that, by 17:00 IST on Day 1, the QIB tranche was already oversubscribed

(*footnote continued*)
in the world, having been established in 1875 as the "Native Shares and Stock Brokers Association." The NSE was incorporated in 1992 as a fully demutualized entity, although trading in the equity segment started only in 1994.

[9] Since November 2010, retail investors in India are classified as those investing up to INR 200,000.

[10] Unlike retail investors, NIIs are high-net-worth individuals and cannot be considered a proxy for uninformed investors.

[11] The impact of the withdrawal of discretionary allocation power has been studied by Bubna and Prabhala (2011), who assert that giving allocation powers to underwriters assists with pre-market price discovery.

[12] Prior to the introduction of mandatory grading, the regulator introduced the optional grading of IPOs in April 2006.

[13] This regulatory setup and the fact that institutional investors are repeat players in the IPO market provide little incentive for institutional investors to inflate demand. The identity of the bidders is known to the registrars, which may further deter the manipulative behavior from QIBs. However, it is possible that QIBs might inflate their demand in the initial days of the book to attract the attention of retail investors, and then reduce their bid price in later bids.

Table 1
An example of the day-by-day building of the IPO book.

This table shows the day-by-day build-up of investor demand in the Omnitech InfoSolutions Ltd., IPO. The daily data were captured at 17:00 Indian Standard Time (IST). Of the 3.33 million shares on offer, QIBs were allocated 1.583 million (50% of the total shares offered), retail investors were allocated 1.108 million shares (35% of the shares). The remaining shares were allocated to non-institutional investors. Subscription rate refers to the number of times a particular tranche is subscribed to. A value greater than 1 signifies 'oversubscription' whereas a value lower than 1 signifies 'undersubscription.' For each category of investors (QIBs and retail investors), final-over-penultimate is the ratio between the final subscription rate and the subscription rate at the end of the penultimate day of bookbuilding.

	QIB Subscription rate	Retail Subscription rate
Day 1 – Jul 19, 2007 17:00 IST	1.4226	0.1780
Day 2 – Jul 20, 2007 17:00 IST	1.4226	0.2813
Day 3 – Jul 23, 2007 17:00 IST	2.8451	1.1692
Day 4 – Jul 24, 2007 17:00 IST	7.8480	2.8663
Day 5 – Jul 25, 2007 17:00 IST	61.7547	50.9535
Final-over-penultimate	7.87	17.78

(by 1.42 times), whereas less than 20% of the retail tranche had been subscribed to. By the end of the penultimate day, QIBs had oversubscribed its tranche by nearly 8 times, whereas the retail tranche was oversubscribed by 2.87 times. The largest demand from retail investors was concentrated on the last day, when their subscription rate rose by almost 18 times, from 2.87 to 51. On the first day of trading, Omnitech's share price closed at INR 163.40, showing a first-day return of nearly 55%. This is nearly four times the median underpricing during our sample period.

3. Testable hypotheses

Given the unique nature of the Indian regulatory setup, in which many regulations have been imposed to protect the interests of the retail investors with low levels of financial literacy (Deb and Marisetty, 2010), we first test the validity of documented certification mechanisms, namely underwriter's reputation and VC affiliation, in terms of their relationships with underpricing.[14] We then test our hypotheses on two new mechanisms: IPO grading and the transparency of the bookbuilding process.

We examine the hypothesis that the reputation of the sponsor acts as a certification mechanism and affects IPO underpricing. Carter and Manaster (1990) and Carter, Dark, and Singh (1998) demonstrate that more-reputable investment banks associate themselves with low-risk offerings with low levels of underpricing. However, Loughran and Ritter (2004) find that, during the dotcom bubble, the prestige of the underwriter went hand-in-hand with leaving more money on the table. IPOs with highly reputable underwriters were relatively more underpriced. Given the contradictory evidence on the relationship between underwriter's reputation and underpricing, our prediction of the relationship between the two is ambiguous.

Our second hypothesis relates to certification by VCs. Since the latter half of the 1990s, India has experienced sound economic growth. This has attracted an increased level of VC investment in Indian firms. Recent figures show that, during 2004–2008, private equity investments in India grew by more than five times (Jain and Manna, 2009). Although VC backing provides a credible signal to the market about the quality of an IPO firm, the evidence on the relationship between VC presence and IPO underpricing is mixed. Lee and Wahal (2004) demonstrate that the presence of VCs increases underpricing, refuting the earlier evidence of Barry, Muscarella, Peavy, and Vetsuypens (1990) and Megginson and Weiss (1991). In the context of our research design, we argue that the presence of VCs is likely to act as a signal to uninformed

[14] There are also other certification mechanisms for firms going public, such as patents (Vismara, forthcoming), or affiliation with universities (Bonardo, Paleari, and Vismara, 2010), public research organizations (Meoli, Paleari, and Vismara, 2013) or top quality auditors Beatty (1989).

investors about the likely growth prospects and/or quality of a firm. This is likely to result in large subscriptions by these investors. Derrien (2005) shows that the presence of uninformed investors (noise traders) results in higher first-day returns. Therefore, we expect VC-backed IPOs to show higher levels of underpricing than unbacked IPOs.

As discussed above, one of the primary objectives of the grading exercise is to reduce information asymmetry between issuers and investors. A high grade should signal a better-quality IPO. If grading is indeed a result of the analysis of the fundamentals of a firm, then grades should be conveying the same information to uninformed investors as costly research conveys to institutional ones. Rating agencies are expected to give grades based on most of the parameters that institutional investors use in their costly research. Taking an analogy from the debt markets, better credit ratings do result in more investment by institutional investors. Hence, we hypothesize that IPOs with higher grades should see greater demand from institutional investors (QIBs).

Further, in line with Deb and Marisetty (2010), we hypothesize that, the higher is the grade awarded to a firm, the lower should be its underpricing. Moreover, international rating agencies are expected to be more sensitive towards their reputational capital. As a consequence, we further hypothesize that IPOs graded by international rating agencies such as CRISIL (owned by S&P), ICRA (whose largest shareholder is Moody's) or Fitch will exhibit less underpricing. In contrast, IPOs graded by local rating agencies, such as CARE and Brickwork, should exhibit a greater amount of underpricing.

As information on bids during the bookbuilding exercise is available in 'real time' and relatively cost-free, retail investors are expected to wait until the 'more informed' institutional investors reveal their preferences (in terms of early bids) towards an IPO. As discussed earlier, institutional investors have incentives to reveal their demand in the early days of the bookbuilding process in order to attract retail investors. Therefore, we hypothesize that retail investors will observe institutional investor demand early before making their bids for IPO shares.

4. Data

The use of the bookbuilding procedure to price IPO shares in India started in 1999 and, as in developed countries around the world, has emerged as the dominant pricing mechanism. Our sample includes the entire population of 354 bookbuilt IPOs on the BSE and the NSE from 1999 to 2011 (June). Of these 354 IPOs, 258 are from the period after bookbuilding had become transparent, and 150 carry grades.[15]

The data for this study come from several sources. We downloaded IPO prospectuses from the website of SEBI, the Indian stock market regulator. Each prospectus provided details of the number of shares issued, the issue price, the age of the firm, the underwriter, the grade awarded to the firm, the name of the grading agency, and the percentage of equity retained by the promoters in the IPO. We checked for VC affiliation by going through all the prospectuses. Information on the bookbuilding exercise for each IPO was downloaded from the BSE and NSE websites. These websites provide information on the start and close of each bookbuilding exercise, and the day-by-day demand in different investor categories. We use the PRIME database rankings of investment banks as our proxy for underwriter's reputation. This database ranks investment banks according to their market share. The top ten investment banks according to the PRIME rankings are considered to have a reputational advantage.

Using proprietary data obtained from a leading IPO registrar, we study the hourly subscription patterns of QIB and retail investors for 15 firms. These firms are fairly representative of those IPOs that generate strong interest among investors. This data provides us with information on the number of retail and institutional investors that arrive in each hour of the bookbuilding process, the number of shares they bid for, and the amount collected from them.[16]

[15] Our study extends the empirical evidence on the role of grading in IPOs, previously studied by Deb and Marisetty (2010) on a sample of 115 ungraded and 48 graded IPOs on the BSE between April 2006 and March 2009.

[16] Confidentiality restrictions prevent us from revealing the identities of the IPO registrar, as well as the firms for which we obtained proprietary data.

4.1. Estimation models and variables used

We first estimate the effects of different certification mechanisms on the subscription patterns of institutional and retail investors. Specifically, we add IPO grading and book transparency to the traditional certification mechanisms of underwriter's reputation and VC affiliation. We capture the impact of book transparency by calculating the ratio of the subscriptions of retail and institutional investors on the penultimate day of the bookbuilding to the total number of shares available for allocation to them. We also introduce a set of common control variables, namely age of the IPO firm, issue size, industry, and year dummies (e.g., Bonardo, Paleari, and Vismara, 2011). We estimate the following two equations:

$$\begin{aligned} QIB\_subscription = {} & \alpha + \beta_1 IBREP + \beta_2 VC\_backing + \beta_3 IPO\_grade \\ & + \beta_4 International\_agency + \beta_5 Subscription\_Penultimate(\text{Retail}) \\ & + \beta_6 Equity\_retention + \beta_7 Age + \beta_8 Issuesize + \beta_9 industry + \beta_{10} IPOyear + \varepsilon. \end{aligned} \quad (1)$$

$$\begin{aligned} Retail\_subscription = {} & \alpha + \beta_1 IBREP + \beta_2 VC\_backing + \beta_3 IPO\_grade \\ & + \beta_4 International\_agency + \beta_5 Subscription\_Penultimate(QIB) \\ & + \beta_6 Equity\_retention + \beta_7 Age + \beta_8 Issuesize + \beta_9 industry + \beta_{10} IPOyear + \varepsilon. \end{aligned} \quad (2)$$

In Eq. (1), *QIB_Subscription* is measured as the ratio of the total shares subscribed to by institutional investors (QIBs) to the total number of shares in the QIB tranche and thus available for allocation. *IBREP* is a measure of the reputation of the book-running investment bank (sponsor). *VC_backing* is a dummy variable that takes a value of 1 if an IPO is VC backed and 0 otherwise. *IPO_grade* is the grade awarded to the IPO firm by a grading agency or 0 for non-graded IPOs. *International_agency* is a dummy variable taking a value of 1 if the IPO was graded by an international grading agency and 0 otherwise. *Subscription_Penultimate* (*Retail*) is the ratio of the total shares subscribed to at the end of the penultimate day of bookbuilding to the total number of shares available to retail investors. This variable is used to study the impact of the transparency of the bookbuilding process. If its coefficient is positive and significant, then it will indicate that, as a result of transparent books, institutional investors learn from the bidding behavior of retail investors. *Equity_retention* is the percentage of equity retained by the owners of the IPO firm.

In Eq. (2), *Retail_Subscription* is measured as the ratio of the total shares subscribed to by retail investors to the total number of shares available in the retail tranche. The independent variables are the same as in Eq. (1) except for *Subscription_Penultimate* (*QIB*), which is the ratio of the subscriptions by institutional investors at the end of the penultimate day of the bookbuilding process to the total number of shares available to them. If the coefficient of this variable is positive and significant, then it will indicate that retail investors learn from the bidding behavior of institutional investors.

In the second part of our analysis, we study the impact of certification mechanisms on the underpricing of IPOs. We estimate the following equation:

$$\begin{aligned} Underpricing = {} & \alpha + \beta_1 IBREP + \beta_2 VC\_backing + \beta_3 IPO\_grade + \beta_4 International\_agency \\ & + \beta_5 Subscription + \beta_6 Equity\_retention + \beta_7 Age + \beta_8 Issuesize \\ & + \beta_9 Market\_momentum + \beta_{10} industry + \beta_{11} IPOyear + \varepsilon. \end{aligned} \quad (3)$$

Here, *Subscription* is the ratio of the total number of shares subscribed to by each category of investors to the total number of shares available to them. This ratio is calculated for QIBs, for retail investors, and for both of them together. *Market_momentum* measures the movement of the S&P CNX Nifty index during the bookbuilding period. All other variables are the same as in Eqs. (1) and (2). We use the traditional measure of adjusted underpricing as the difference between the offer price and the first-day closing price.

To test the relative importance of early bids from QIBs and IPO grades as certification mechanisms for retail investors, we also run tests on the sample of 150 graded IPOs. However, these tests may suffer from selection bias in the sense that grading, which has been compulsory since May 2007, may have changed the nature of the firms going public. To address this possibility, we use an instrumental variable, *propensity to be graded*. We employ the Heckman procedure to create the instrument. We run

a probit regression on the whole sample of 354 IPOs to predict the probability of their being graded. This regression is then used to create the selectivity instrument, which is included among the baseline regressors in our regression models.

Table 2 gives the definitions of the variables considered in our study while the Appendix presents the correlation matrix of these variables.

5. Results

Table 3 provides information on the level of IPO activity, the extent of bookbuilding, and underpricing in India during 1999–2011 (June). Like many markets around the world, a large number of Indian IPOs came to the market during the height of the dotcom bubble. The subsequent market crash had a big impact on the Indian IPO market. There were almost no IPOs in 2001–2002. IPO activity picked up again from 2003 and rose consistently until the onset of the financial crisis in 2007. From a peak of 86 IPOs in 2007, the number of IPOs fell to 16 in 2008 and 20 in 2009. However, in 2010 the number of IPOs increased threefold to 61. The first two quarters of 2011 saw just 18 IPOs come to the market. In the initial years after the bookbuilding exercise was introduced in India, only 10% of firms chose to use the procedure to price their shares. With time, more firms began to use it and, by 2005, nearly 70% of IPOs were using bookbuilding. This increased to 86% in 2006 and 2007, and, since 2008, all IPOs in India have been bookbuilt.

Table 2
Description of the variables used in the study.

Variable	Description
Subscription	For each category of investors (QIBs and retail investors), subscription is measured as the total shares subscribed to as a proportion of the total number of shares available to them. This is measured after the book has been built: $SUBSCRIBED_{FINAL}/AVAILABLE$
Subscription penultimate	For each category of investors (QIBs and retail investors), this ratio is measured as the total shares subscribed to at the end of the penultimate day of bookbuilding over the total number of shares available to them. This is measured after the book has been built: $SUBSCRIBED_{PENULTIMATE}/AVAILABLE$
Last-day retail subscription	This variable indicates the last-day build-up of retail demand in terms of the number of shares subscribed to by the retail investors on the last day of bookbuilding as a proportion of the total number of shares available to them: $SUBSCRIBED_{LAST\_DAY}/AVAILABLE$
Final-over-penultimate	This variable is measured as the ratio between the final subscription rate and the subscription rate at the end of the penultimate day of bookbuilding: $SUBSCRIBED_{FINAL}$ / $SUBSCRIBED_{PENULTIMATE\text{-}DAY}$
Final-over-first	This variable is measured as the ratio between the final subscription rate and the subscription rate at the end of the first day of bookbuilding: $SUBSCRIBED_{FINAL}/SUBSCRIBED_{FIRST\text{-}DAY}$
Underpricing	This is the measure of market-adjusted underpricing used in the literature: [(*Closing Price* − *Offer Price*)100/*Offer Price*] − *Market return*
IBREP	This variable is a proxy for the reputation of the book-running investment bank (sponsor). *IBREP* is set equal to 1 if the book-running investment bank is ranked in the top ten of the PRIME database, otherwise it is set equal to 0.
VC-backing	A dummy variable that takes a value of 1 if an IPO is VC-backed and 0 otherwise.
IPO-grade	The actual grade, 1 to 5, awarded to the firm by the rating agency.
International-agency	A dummy variable that takes a value of 1 if the IPO was graded by an international rating agency (CRISIL-S&P, ICRA-Moody's or FITCH).
Equity-retention	Percentage of equity retained by the owners of the firm.
Age	Number of years from the incorporation of the firm to the year of the IPO.
Issuesize	Size of the IPO offer, in Indian Rupees (INR).
Market Momentum	(*Closing value of S&P CNX Nifty on the day of listing – Closing value of S&P CNX Nifty on the day of book closure*)/(*Closing value of S&P CNX Nifty on the day of book closure*).

Table 3
The underpricing of bookbuilt IPOs.
This table shows the yearly IPO activity in India during the years 1999–2011 (June). Tests on the differences between graded and non-graded IPOs are significant at the 1% level (***), based on *t*-statistics (mean) and the Mann-Whitney *U*-test (median).

Year	Total number of IPOs	Population of bookbuilt IPOs	Average underpricing (%)	Median underpricing (%)
1999	51	5	55.3	18.3
2000	109	11	16.0	17.9
2001	6	1	−8.7	−8.7
2002	6	2	15.0	15.0
2003	18	7	69.7	46.0
2004	23	15	45.1	27.8
2005	78	55	33.9	29.6
2006	80	69	18.0	1.1
2007	86	74	34.3	20.1
2008	16	16	21.0	4.0
2009	20	20	9.2	3.9
2010	61	61	13.3	8.8
2011 (June)	18	18	3.9	−5.4
Non-graded firms		204	31.4	19.9
Graded firms		150	15.2***	5.8***
Total	572	354	24.6	13.6

The IPOs show an average underpricing of about 25%. After reaching a peak of 70% in year 2003, underpricing has been on the decline. Since 2008, underpricing levels in Indian IPOs have been exceptionally low, ranging from 9.2% in 2009 to about 4% in the first half of 2011.

Table 3 also shows that, on average, graded IPOs are underpriced to a lesser extent than ungraded IPOs. However, the level of underpricing has been decreasing since 2003 (except in 2007), long before the implementation of compulsory grading in May 2007. It is possible that the decrease in underpricing since 2007 is due to a general macro-economic trend, as has been seen since the subprime crisis in most IPO markets around the world.

Table 4 provides the descriptive statistics for the variables. The institutional investor tranche shows higher levels of oversubscription than the retail tranche. On average, the QIB tranche is oversubscribed by 22.5 times, as compared to a 10.6 times oversubscription of the retail tranche. Almost half of the IPOs in our sample (48%) are sponsored by reputable underwriters and nearly a third have VC backing. The average grade of an IPO is 2.69, indicating average fundamentals. Only a handful of IPOs in our sample received the highest grade of 5. Almost 6 out of 10 graded IPOs were rated by an international grading agency. On average, existing shareholders retain 60% of the equity of the firm after an IPO. Indian regulations specify a minimum dilution of 25% for IPOs with an issue size less than INR 40 billion and a minimum of 10% for larger issues. In our study, we have only 7 issues in the second category. Indian promoters therefore do not sell substantially much more equity than the minimum required under the regulations (40% vs. 25%). The average age of an Indian IPO firm is 15.4 years, while the average amount of money raised in an IPO is INR 4.4 billion (about US$ 75 million).

5.1. Subscription patterns

The transparency of the Indian bookbuilding process permits us to dissect the components of demand by investor type. Fig. 1 shows the subscription patterns of retail and institutional investors during the bookbuilding period, for 258 IPOs with transparent books.[17] It is interesting to note that

[17] We show cumulative daily bids by retail and institutional investors for the first, second, penultimate, and final days of the bookbuilding exercise. Regulations (No. 46 of Issue of Capital and Disclosure Requirements) stipulate that bookbuilding can last for 3–10 working days at the choice of the underwriter and issuer. The regulations further stipulate that in case there is a revision of the price band, books should remain open for a minimum period of 3 days post-revision, subject to the condition

Table 4
Descriptive statistics of the variables used in the study.
This table presents the descriptive statistics for 354 book-built IPOs. The IPO-grade and international-agency statistics apply to the 150 graded IPOs. Three firms were rated by two rating agencies. Each of them is considered an IPO graded by an international agency. Variables are defined in Table 2.

Variable	Mean	Median	Min	Max
Retail Subscription (times)	10.6	4.6	0.1	133.5
QIB Subscription (times)	22.5	7.2	0.1	185.1
Underpricing (%)	24.6	13.6	−52	326.7
IBREP (%)	48.0	–	0	1
VC_backing (%)	36.2	–	0	1
IPO_grade (1–5)	2.69	3	1	5
International_agency (%)	59.3	–	0	1
Equity_retention (%)	60.0	61.3	20	90
Age (years)	15.4	13	0	102
IssueSize (INR billion)	4.4	1.1	0.02	154.7
Market-Momentum (%)	0.6	2.0	−20.5	23.6

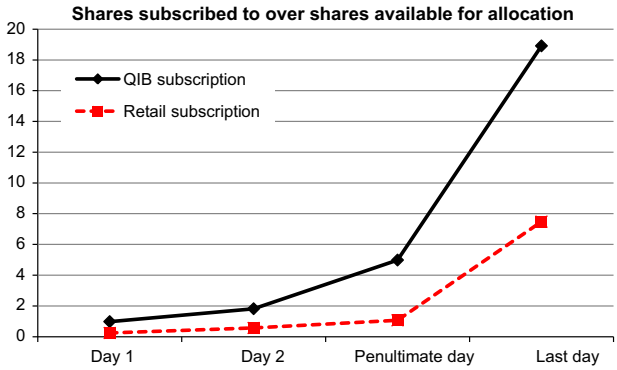

Fig. 1. Subscription patterns of institutional and retail investors. The figure shows the cumulative subscriptions by institutional and retail investors to the 258 IPOs from 2006, when transparent bookbuilding was introduced. The subscription levels of the retail and institutional (QIB) investors are measured as the ratio of the total shares subscribed to by them to the total shares available to them. A subscription level of less than 1 demonstrates undersubscription.

institutional investors (QIBs) submit their bids very early in the bookbuilding process. On average, the QIB tranche of the IPO shares is 98% subscribed by the end of the first day of the bookbuilding exercise. By the second day, the QIB tranche is oversubscribed by 1.8 times. In comparison, on average only 24% of the shares in the retail tranche are subscribed to on the first day. Retail subscription levels reach 100% only during the penultimate day of the bookbuilding exercise, by which time the QIBs are already oversubscribed by 5 times. Retail investors reveal their full demand only on the last day of the book. The final oversubscription rates are 7.5 times for retail investors and 18.9 times for institutional investors.[18] We argue that, as an outcome of the transparency of the Indian bookbuilding exercise, it is

(*footnote continued*)
that the overall bookbuilding time does not exceed 10 days. We ignore other days in Fig. 1 because most IPOs have their books open for 4 or 5 days, others for 7 days or even longer.

[18] On the last day of the book, a movement from 1X to 8X for retail investors cannot be directly compared to a movement from 5X to 19X for QIBs. Oversubscription in the retail tranche requires an exceptionally large number of retail applications because of the ceiling on the amount retail investors can invest. From 2000 to 2003, retail investors could apply for a maximum of 1,000 securities. From August 2003 until March 2005, they could invest up to INR 50,000. From March 2005 until October 2010, this limit was increased to INR 100,000. From November 2010, retail investors have been allowed to invest up to INR 200,000. There are no ceilings on QIB investments.

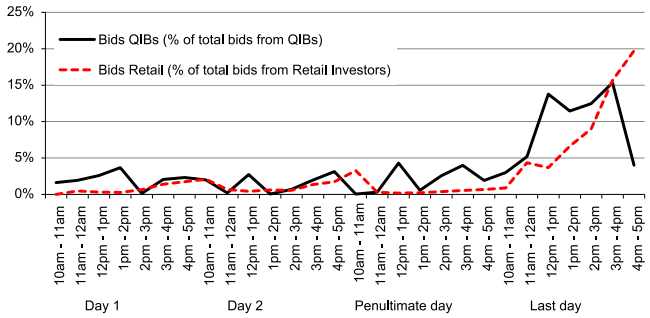

Fig. 2. Hourly subscription patterns of institutional and retail investors. The figure shows the number of shares bid for by QIB and retail investors, in each hour of the bookbuilding process. The data refer to 15 IPOs for which we were able to access proprietary information from an IPO registrar. Each point in the graph shows the number of bids made in that hour by the corresponding category of investors, as a percentage of their respective total number of bids after the book had been built. For example, 5% means that 5% of the total bids made by QIB or retail investors took place in that hour.

possible that retail investors observe institutional investors′ bids in the early days of the book and then make their investment decisions. A strong institutional response on the first or second day of the bookbuilding exercise can act either as a certification mechanism or as a sequential learning signal for retail investors. We therefore find some initial support for our hypothesis that retail investors observe institutional investors′ behavior before making their bids for IPO shares.

Fig. 2 shows the hourly subscription patterns of institutional and retail investors for 15 IPOs for which we have proprietary data. Each point in the graph shows the number of bids made in that hour by a category of investors, as a percentage of their respective total number of bids at the end of the bookbuilding exercise.[19] The figure shows that, during the first day of the bookbuilding process, QIB bids dominate those of retail investors. Retail demand is somewhat flat for the second and the penultimate day. It is only on the last day of the book that retail investors reveal their true demand for the IPO. Further, it is interesting to note that, on the last day, QIBs submit most of their bids in the morning, whereas retail investors come in the final hours of the book.

Table 5 presents the effects of various certification mechanisms on the subscription patterns of institutional and retail investors. Models 1 and 3 include all the IPOs from 1999 to 2011, whereas Models 2 and 4 focus on IPOs that happened post-2006, when the bookbuilding process became transparent. Model 1 shows that, for institutional investors, the underwriter′s reputation and the IPO grade convey important certification signals. IPOs with reputable underwriters, high grades (grades of 4 or 5), and those graded by international grading agencies see a higher rate of institutional subscriptions. For retail investors, these certification mechanisms are of limited use (Model 3).

Having demonstrated that higher grades have a positive effect on the QIB subscription patterns, we now investigate whether the transparency of the book sends a stronger signal to retail investors than does the grading of IPOs. For this purpose, we look at the day-by-day demand build-up of institutional and retail investors. We evaluate whether institutional investors make their investment decisions by observing the demand patterns of retail investors, and vice versa. We do this by including the variables *Subscription_Penultimate*(*Retail*) and *Subscription_Penultimate*(*QIB*) as regressors. Models 2 and 4 in Table 5 show the results. We find that early bids from retail investors do not affect institutional bids, whereas early institutional bids have a strong positive impact on retail bids. This shows that learning is unidirectional, from institutional to retail investors. This result also explains our earlier results from Models 1 and 3. Certification mechanisms such as underwriter′s reputation and grading do not play any role in influencing retail demand because retail investors only learn from institutional bids. As the institutional investors′ responses to an IPO already incorporate the effects of the underwriter′s reputation and grading, retail investors ignore these certification signals and only follow the certification signal emanating from an early institutional demand for IPO shares.

[19] The QIBs cannot modify the number of shares bid for, although they can reduce their bid price.

Table 5
Certification mechanisms and subscription patterns of institutional and retail investors.

This table compares the relative effectiveness of the different certification mechanisms. The subscription levels of the retail and institutional (QIB) investors are dependent variables and are measured as the total shares subscribed to by them as a proportion of the total shares available to them. Variables are defined in Table 2. We control for year and industry fixed effects using dummy variables. We do not have information on all the variables for 6 IPOs from the original population. This reduces the sample to 348 bookbuilt IPOs. Models 2 and 4 include post-2006 IPOs, 2006 being the year when transparent bookbuilding was introduced.

Heteroscedasticity consistent robust *t*-statistics are in parentheses. *** Indicates significance at the 1% level, ** at the 5% level, * at the 10% level.

	Model 1 QIB	Model 2 QIB	Model 3 Retail Investors	Model 4 Retail Investors
Constant	12.29(1.55*)	11.23(1.88*)	14.68(3.25***)	8.25(2.15***)
IBREP	17.22(4.22***)	16.01(3.73***)	1.09(0.55)	0.11(0.08)
VC_backing	0.10(0.05)	0.33(0.21)	0.15(0.12)	0.56(0.07)
Grade 1	−1.28(−1.00)	−0.68(0.53)	−0.31(−0.52)	0.34(0.22)
Grade 2	−0.81(−0.88)	−0.84(−0.88)	−0.12(−0.34)	−1.21(−0.93)
Grade 3	0.61(0.98)	1.15(1.37)	−0.22(−0.07)	−0.89(−0.10)
Grade 4 or 5	2.21(2.85***)	1.89(2.67***)	0.32(0.69)	1.22(1.20)
International_Agency	1.51(2.45**)	1.25(1.91*)	0.40(0.30)	1.18(1.48)
Equity_Retention	−0.21(−1.29)	−0.16(−0.58)	−0.42(−1.34)	−0.36(−0.66)
Subscription_Penultimate (QIB)	–	–	–	1.25(3.84***)
Subscription_Penultimate (Retail)	–	0.55(1.61)	–	–
Log_Age	−0.30(−0.11)	0.43(0.16)	−0.16(−0.12)	0.12(0.08)
Log_IssueSize	−0.15(−0.27)	−0.71(1.93*)	−0.49(−1.83*)	−1.46(−2.21**)
Industry dummies	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES
N	348	258	348	258
Adj. *R* square	0.110	0.188	0.033	0.267

To further check whether retail investors do indeed learn from institutional subscriptions, we measure retail demand at different points in time during the bookbuilding process. Along with the total retail subscription at the close of the book, we also measure the last-day subscription, the retail demand build-up from the penultimate to the last day of the book (final-over-penultimate), and the retail demand build-up from the first to the last day of the book (final-over-first). The results in Table 6 confirm that the retail subscription levels (overall and on the last day of the bookbuilding exercise) are largely determined by the early bids from institutional investors. Institutional subscriptions that have been made by the penultimate day of the bookbuilding exercise not only affect the level of last-day retail subscriptions but also the build-up of retail demand from the penultimate to the last day of the book. Once again, the results show that, in the presence of information on institutional subscriptions, grading becomes irrelevant for retail investors. Effectively, grading does not provide any additional information to retail investors other than what is already provided as a result of the transparency of the bookbuilding process.

5.2. IPO underpricing

Table 7 presents the results of our regression analyses on IPO underpricing. Model 1 tests the relationship between the underwriter's reputation (IBREP) and the first day's underpricing. The coefficient of IBREP is insignificant. This shows that, in the case of India, underwriter's reputation does not work as a certification mechanism to mitigate information asymmetry. Model 2 assesses the certification role of VCs in Indian IPOs. We find that the presence of a VC has no significant effect on the level of underpricing of an Indian IPO. Model 3 demonstrates the effect of grading on IPO underpricing. The results show that there is no significant impact. In Models 4–7, we include all the certification mechanisms considered in Models 1–3, along with the subscription levels of the retail and institutional investors. In Model 4, we consider the subscriptions from retail investors, measured as the total shares subscribed to by retail investors as a proportion of the total number of shares

Table 6
The relative effectiveness of the different certification mechanisms in explaining the subscription patterns of retail investors.

This table compares the relative effectiveness of the different certification mechanisms. The subscription levels of the retail investors are dependent variables and have been measured as (1) the total shares subscribed to by them as a proportion of the total shares available to them, Model 1 (Subscription); (2) the number of shares subscribed to on the last day of bookbuilding as a proportion of the total number of shares available to them, Model 2 (Last-day Subscription); (3) the ratio between the final subscription rate and the subscription rate at the end of the penultimate day of bookbuilding, Model 3 (Final-over-penultimate); (4) the ratio between the final subscription rate and the subscription rate at the end of the first day of bookbuilding, Model 4 (Final-over-first). Variables are defined in Table 2. In Models 1 and 2, Propensity-to-be-Graded is an instrumental variable created using the Heckman procedure to control for a potential self-selection bias in the decision to be graded. We control for year and industry fixed effects using dummy variables. Models 1 and 2 refer to the 150 graded IPOs, while models 3 and 4 consider the 258 IPOs since 2006, when transparent bookbuilding was introduced.

Heteroscedasticity consistent robust *t*-statistics are in parentheses. *** Indicates significance at the 1% level, ** at the 5% level, * at the 10% level.

	Model 1 Total subscription	Model 2 Last-day subscription	Model 3 Final-over-penultimate	Model 4 Final-over-first
Constant	3.83(4.87***)	3.25(4.58***)	1.39(2.04**)	2.31(2.56**)
IBREP	0.06(0.01)	0.22(0.09)	0.81(0.54)	1.36(0.64)
VC_backing	0.30(0.03)	0.04(0.03)	0.26(0.18)	0.43(0.24)
Grade 1			−0.31(0.21)	0.20(0.13)
Grade 2	−3.36(−0.95)	−2.88(−0.72)	−1.15(−0.83)	−0.12(−0.23)
Grade 3	−0.66(−0.06)	−0.87(−0.15)	0.99(1.10)	−0.64(−0.87)
Grade 4 or 5	0.95(0.14)	1.78(0.19)	1.48(1.46)	0.54(0.83)
International_Agency	1.39(1.88*)	0.87(0.24)	1.18(1.69*)	0.88(0.45)
Equity_Retention	−0.15(−0.25)	−0.21(−0.34)	−0.77(−1.54)	−0.27(−0.71)
Subscription_Penultimate (QIB)	0.93(6.92***)	0.91(6.34***)	1.05(2.66***)	0.67(1.74*)
Propensity-to-be Graded	0.42(0.13)	0.81(0.54)	–	–
Log_Age	0.10(0.06)	0.14(0.11)	0.41(0.15)	1.56(1.72*)
Log_IssueSize	−1.73(−2.57***)	−2.67(−3.25***)	−0.56(−1.83*)	−1.63(2.69***)
Industry dummies	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES
N	150	150	258	258
Adj. *R* square	0.365	0.324	0.255	0.115

available to them. Model 5 considers the subscriptions from institutional investors, and in Model 6 we consider the overall oversubscription rate for both institutional and retail investors together. The results confirm that underwriter's reputation, VC affiliation, and grading are not related to IPO underpricing. As documented by Bubna and Prabhala (2011), we also show that a high level of investor subscription has a strong positive effect on initial returns. As a robustness check, in Model 7 we consider IPOs that occurred post-2006, which was when transparent bookbuilding was introduced in India. The results remain unchanged.[20]

6. Conclusions

India has a modified bookbuilding process that is extraordinarily transparent. Investors are able to observe the process live on the Internet. We study the role this transparency plays in generating investor interest in IPO firms, and the impact of such investor interest on the subsequent performance of IPOs in the immediate aftermarket.

[20] For robustness and for comparability of our results with those of Deb and Marisetty (2010), we use the same definition of grading as in Deb and Marisetty. We re-run the regressions reported in Table 7 with the grading variable defined as an indicator variable that takes the value of 1 for IPOs with a grade of 3 or above and 0 otherwise. Our baseline results remain unchanged in that grading does not affect underpricing.

Table 7
Certification mechanisms and underpricing of IPOs.

This table presents the effects of different certification signals, using underpricing as the dependent variable, on the full sample. Variables are defined in Table 2. We control for year and industry fixed effects using dummy variables. For Models 1–6, the sample is made up of 348 bookbuilt IPOs. Model 7 includes post-2006 IPOs, 258, 2006 being the year when transparent bookbuilding was introduced. Heteroscedasticity-consistent robust *t*-statistics are in parentheses. *** Indicates significance at the 1% level, ** at the 5% level, * at the 10% level.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	7.77(4.40***)	6.67(3.96***)	7.45(4.42***)	4.56 (3.04***)	2.27(2.31***)	3.48 (2.82***)	2.27 (2.31***)
IBREP	0.78(1.39)	–	–	0.41(0.85)	0.58(0.81)	0.61(1.12)	0.34(0.41)
VC – backing	–	0.85(1.42)	–	0.21(0.43)	0.83(1.56)	0.56(0.88)	0.44(0.46)
Grade 1	–	–	−3.00 (−1.69)	−1.61 (−1.11)	−2.93 (−1.35)	−1.75 (−1.27)	−1.24 (−0.89)
Grade 2	–	–	−0.97 (−0.97)	−0.13 (−0.15)	−0.45 (−0.21)	0.05(0.08)	−0.53 (−0.22)
Grade 3	–	–	−0.36 (−0.38)	−0.28 (−0.37)	−0.30 (−0.38)	−0.38 (−0.41)	−0.56 (−0.59)
Grade 4 or 5	–	–	1.66(0.13)	−5.14 (−0.49)	−1.24 (−0.27)	−3.44 (−0.38)	−6.71 (−1.19)
International_Agency	–	–	−0.34 (−0.12)	−0.12 (−0.09)	−0.11 (−0.05)	0.08(0.03)	−0.13 (−0.09)
Subscription Retail	–	–	–	1.76 (12.71***)	–	–	–
Subscription QIB	–	–	–	–	1.83 (14.20***)	–	–
Subscription	–	–	–	–	–	1.87 (13.86***)	1.31 (5.92***)
Equity_Retention	−0.35 (−1.92*)	−0.25 (−1.35)	−0.37 (−2.30**)	−0.06 (−0.39)	−0.22 (−1.29)	−0.24 (−1.30)	−0.11 (−1.12)
Log_Age	2.25(0.59)	3.16(0.82)	1.58(0.41)	1.68(0.53)	1.95(0.47)	1−62(0.49)	1.06(0.23)
Log_IssueSize	−2.73 (−4.31***)	−2.87 (−4.54***)	−2.36 (−2.75***)	−1.19 (−1.72*)	−1.27 (−2.56**)	−1.23 (−1.76*)	−1.24 (−1.84*)
Market-Momentum	−0.11 (−1.01)	−0.15 (−1.35)	−0.10 (−0.78)	−0.01 (−0.05)	−0.11 (−1.02)	−0.18 (−1.49)	−0.03 (−0.10)
Industry dummies	YES	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES	YES
N	348	348	348	348	348	348	258
Adj. R^2	0.081	0.081	0.077	0.410	0.364	0.402	0.267

We find that transparent books benefit investors in that retail investors observe subscriptions by more-informed institutional investors before revealing their bids at the end of the bookbuilding process. IPOs with high numbers of institutional bids in the early days of the book also see high demand from retail investors. Such IPOs show a high level of underpricing. Known certification mechanisms such as underwriter's reputation and IPO grade are important only in generating institutional interest during the bookbuilding process of IPOs with reputable underwriters. Retail bids remain unaffected by such certification signals. Instead, retail investors treat early bids by institutional investors (observable because of the transparent books) as a certification signal.

Our findings suggest that there is sequential learning amongst Indian IPO investors. Institutional investors bid for shares in the early days of the bookbuilding exercise, so as to entice retail investors into applying for shares. Retail investors follow the institutional investing patterns. When many retail investors bid for shares, IPOs are oversubscribed. This benefits institutional investors, who may decide to sell part of their allocation at a higher price during the first few days of trading.

We test whether documented certification mechanisms such as underwriter's reputation and VC affiliation play any role in explaining the first-day returns of IPOs. We find that these mechanisms do *not* play any significant role in explaining the underpricing of Indian IPOs. We then discuss the validity of a new certification mechanism (IPO grading) and document the certification role of another, more relevant mechanism, namely India's transparent bookbuilding. Other markets interested in protecting

Table A1
Pearson's correlations of the variables used for the study.

	Subscription	Subscription Retail	Subscription QIBs	Underpricing	IBREP	VC_backing	IPO_Grade	Equity_ Retention	Age	IssueSize
Subscription	1									
Subscription Retail	0.88	1								
Subscription QIBs	0.92	0.61	1							
Underpricing	0.41	0.48	0.36	1						
IBREP	0.33	0.14	0.35	0.02	1					
VC_backing	0.15	0.06	0.17	0.02	0.32	1				
IPO_grade	0.31	0.16	0.36	−0.03	0.48	0.26	1			
Equity_retention	0.14	0.10	0.16	0.02	0.14	−0.23	0.29	1		
Age	0.10	0.12	0.09	−0.03	0.05	−0.08	0.26	0.15	1	
IssueSize	0.08	−0.03	0.14	−0.03	0.25	−0.07	0.33	0.34	0.12	1

and promoting retail ownership in newly listed firms should explore the feasibility of using transparent books in their IPO processes.

Appendix A

See Table A1.

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