

Do Investors Flip Less in Bookbuilding than in Auction IPOs?

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Abstract

Using a regime change setting, this paper examines whether investors flip their initial allocation less in bookbuilding in comparison to auction initial public offerings (IPOs). Based on bookbuilding theory, we posit that the ability to control allocation flexibility in the bookbuilding mechanism should enable underwriters to avoid flippers and target long-term investors. Consistent with this premise, we find that investors flip significantly less in bookbuilding IPOs, both in overall terms and separately for frequent and non-frequent investors. We also find that the influence of underwriter reputation is stronger in bookbuilding regime with frequent investors flipping considerably less in IPOs that are managed by high reputation underwriters in bookbuilding IPOs compared to auction IPOs. Both frequent as well as non-frequent investors in bookbuilding IPOs continue to hold their shares for much longer than investors in auction IPOs. The results highlight the benefits of allocation discretion, which allows underwriters to influence investors' behavior as well as use non-bid information in the IPO process.

Keywords: flipping, bookbuilding, auction, IPO, Indian IPOs, allocation discretion

JEL Classification: G24, G32

This version: 15th August 2016

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1. Introduction

The search for an optimal mechanism to bring initial public offerings (IPOs) to the market has long been of interest to both academics and policy makers. In recent times, bookbuilding has emerged as the leading selling mechanism around the world (Jagannathan et al., 2015).¹ Despite its popularity, bookbuilding is criticized for the discretion it offers to underwriters in pricing and allocating the shares to investors. Proponents of bookbuilding argue that this discretion allows underwriters to extract information and incorporate non-bid information from investors, thus helping to increase the pricing efficiency of the IPO (Benveniste and Spindt, 1989; Benveniste and Wilhelm, 1990; Sherman, 2000). On the other hand, critics of bookbuilding argue that the discretionary power allows underwriters to develop relations with investors for their mutual benefit (Loughran and Ritter, 2004; Nimalendran et al., 2007; Ritter, 2011). Investigations have added to this debate by comparing valuation efficiency and other pricing issues across bookbuilding and other mechanisms (Bubna and Prabhala, 2011; Degeorge et al., 2007; Kutsuna and Smith, 2004; Lowry et al., 2010). Although studies have examined investors' flipping their initial allocation in bookbuilding, (Aggarwal, 2003; Krigman et al., 1999) and auction mechanisms (Degeorge et al., 2010) separately, to the best of our knowledge no prior study has compared flipping in these two mechanisms, particularly in a regime change setting. Our paper fills this void.

To what degree IPO investors flip their initial allocation is important to both issuers and underwriters. Although flipping provides immediate post issue liquidity, issuers want their shares to be allocated to long-term investors ("strong hands") (Aggarwal, 2003). Similarly, underwriters would prefer that their IPOs do not have significant levels of flipping as this poses

¹ Bookbuilding, fixed price and auction mechanisms have been the three most commonly used mechanisms, although bookbuilding has become the most dominant in recent times. See Jagannathan et al. (2015) for a detailed discussion of the various allocation mechanisms and other issues associated with them.

difficulties in stabilizing the IPO market, particularly in those with weak demand (Ellis, 2006). The main aim of our paper is to examine whether underwriters use the discretionary power allowed in the bookbuilding mechanism to place shares with investors who are less likely to flip their initial allocation. In addition, we also develop other related hypotheses (see section 2) based on bookbuilding theory, which include the implications of the long-term relation between underwriters and frequent IPO investors (Benveniste and Spindt, 1989; Sherman, 2000).

We examine our hypotheses in the Indian IPO market, which offers an ideal setting to test the flipping behavior of investors in bookbuilding and auction IPOs for the following reasons. First, in November 2005, after a few years of experimentation with a modified form of bookbuilding mechanism, Indian regulators abandoned it in favor of a Dirty Dutch Auction mechanism.² Although the bookbuilding mechanism allowed underwriters to exercise discretion in pricing and allocating shares to institutional investors, the allocation discretion was withdrawn in the auction regime. The latter regime allows the underwriter to set a price below the market clearing price but is required to use prorated allocation. Consequently, the availability of IPO data from bookbuilding and auction regimes within a short time interval allows us to compare flipping in a regime change setting.³

Second, Indian regulation requires IPO firms to reserve and allocate a pre-determined quota of shares to different investor categories: institutional investors receive 50% of the allocation and the other 50% is allocated to retail and non-institutional investors. Importantly, underwriters' allocation discretion in the bookbuilding regime is only in the institutional

² See Bubna and Prabhala (2011) and Neupane and Poshakwale (2012) for a detailed description of the two regimes relevant to our study.

³ Bubna and Prabhala (2011) use this setting to investigate pre-market price discovery, underpricing, bidding and allocation and show that in bookbuilding underwriters extensively exercise discretion in allocation. Our study differs substantially from theirs, but complements their findings on discretionary role of underwrites, as we examine the role of discretion on flipping in the post-IPO trading period.

investor category with pro-rata allocation in the other categories. Thus, given that underwriters have no control over 50% of the allocation and if flipping is a concern, then we should observe allocation preference to institutional investors who are likely to hold for a longer period, particularly in IPOs where flipping is a concern.

Third, the Indian setting also provides us a unique database allowing us to track every single trade made by foreign institutional investors (FII, hereafter). This publicly available database from the Securities and Exchange Board of India (SEBI, hereafter) contains every FII trade made since 2003. We are able to track every allocation to FII from the date of IPO allocation to the time they are finally sold.⁴ Although this is a subset of the overall IPO allocation, FII constitute one of the largest institutional investor categories – they receive about 50% of the institutional allocation which translates into about 25% of the total shares offered in the IPO. Our sample consists of 45 bookbuilding and 58 auction Indian IPOs, all issued during a three-year window between 2004 and 2006. We identify a total of 3,009 individual FII allocations for these 103 IPOs and initially analyze flipping in the first three days of listing.

Several important findings emerge from our empirical tests. Overall, we find that investors flip significantly less in bookbuilding than in auction IPOs. In line with the theoretical prediction, this suggests that the discretionary allocation provision in bookbuilding allows underwriters to favor investors who are less likely to flip in the immediate period after listing. Consistent with the view that bookbuilding allows underwriters to develop long-term relations with investors; we find that the influence of high reputation underwriters on flipping is stronger in the bookbuilding regime. Investors in the top tercile of allocation, who on average receive a sizeable 2.75% of the total offer, flip about 13% less in IPOs managed by high reputation underwriters in the bookbuilding regime compared to IPOs in the auction regime. We also find

⁴ We describe this database in Section 3.

that investors in bookbuilding regime flip less in IPOs with weaker demand than in the auction regime, consistent with bookbuilding theories.

We also perform the analysis separately for frequent and non-frequent investors and find that both the investor categories flip significantly less in bookbuilding IPOs. Consistent with bookbuilding theories, frequent investors who receive allocation in the top (middle) tercile flip about 16% (22%) less in IPOs managed by high reputation in bookbuilding IPOs. As non-frequent investors flip significantly less in bookbuilding IPOs, we argue that the discretionary power enables underwriters to target investors who are likely to hold the stock for a considerable length of time. We also perform a probit analysis to examine the likelihood of holding the entire allocation and find that bookbuilding investors are more likely to hold their entire allocation than investors in the auction regime. This effect is also stronger in IPOs managed by high reputation underwriters.

To provide additional support of our evidence, we track the 3,009 IPO allocations for six months after listing. Although the difference in flipping for frequent investors across the two mechanisms weakens for the overall sample, we find significant difference in long-term holdings across the two IPO mechanisms for both the investor categories and the effect is stronger in IPOs managed by leading underwriters for frequent investors. Further, a disproportionately larger number of frequent and non-frequent investors hold on to their entire allocation at the end of the six months of listing in bookbuilding IPOs compared to auction IPOs. Additionally, we undertake a number of robustness tests, including the use of alternative specifications of some of the main variables, and find that our results are qualitatively similar. Overall, these results indicate that the regulatory change that led to the withdrawal of allocation powers of underwriters brought a significant change in the flipping behavior of investors.

Our paper makes two main contributions to the IPO literature. First, it offers new evidence on the flipping behavior of investors across the two main IPO allocation mechanisms. This contributes to the debate on the efficiency of IPO mechanisms and shows that the provision of discretion in allocation helps reduce flipping by IPO investors. Second, our results provide evidence on the less discussed non-frequent investors participating in IPOs. The evidence suggests that the discretionary power allows underwriters to target and preferentially allocate shares to long-term investors who might be of strategic interest to the firm involved. At the very least, the significant change in flipping behavior of investors with the change in IPO process implies that the presence of allocation flexibility encourages long-term investors to selectively participate in IPOs that are of interest to them.

The rest of the paper is structured as follows. Section 2 develops the hypotheses. Section 3 presents the data and summary statistics. In Sections 4 and 5 we present our empirical analysis. Section 6 offers some robustness tests to provide some support to our overall findings and section 7 concludes the paper.

2. Hypotheses development

A key difference between the bookbuilding and auction IPO mechanisms is the discretion available to underwriters in allocating shares. In contrast to auction IPOs, under the bookbuilding mechanism underwriters are allowed to exercise discretion in determining the share allocation rules. Proponents of the bookbuilding mechanism argue that this discretion allows underwriters to improve the efficiency and attain the objectives of the offering. One of the objectives of the offering, often presented by investment banks during roadshows, is the preferential allocation of shares to individuals/institutions who are long-term investors. This approach to allocation is commonly known as the pitchbook view of bookbuilding (Nimalendran et al., 2007). Consistent with this view, in their analysis of bookbuilding IPOs,

Cornelli and Goldreich (2001) and Jenkinson and Jones (2004) report evidence of preferential allocation to investors who are perceived to be long-term holders of the stock. Also, in a survey of institutional investors, Jenkinson and Jones (2009) show that investors believe that their chance of receiving allocations improves if they are perceived as long-term investors.

The IPO listing process involves repeated interaction between underwriters and investors interested in subscribing to the IPOs. Existing research suggests that this setting, coupled with the allocation discretion available to bookbuilding underwriters, allows them to develop a sustained relation with a network of IPO investors. By rewarding the investors (through greater allocation of underpriced shares) and/or threatening them (with exclusion from the network), underwriters can influence investors' behavior to achieve the objectives of the offering. Thus, unlike in the auction mechanism, underwriters in bookbuilding can discourage investors from flipping by threatening them with exclusion from future share allocations. Given that underwriters in the auction mechanism do not have allocation discretion and consequently no power in penalizing investors who flip their allocation (Degeorge et al., 2010), our first main hypothesis is:

H₁: IPO investors flip less in bookbuilding than in auction IPOs.

Based on previous findings in the IPO literature we further develop three sub-hypotheses that center on the allocation discretion and reputation of the underwriters, the strength of the offering and the investing behavior of the investors to more fully understand the flipping behavior of investors.

High reputation (top-tier) underwriters not only manage the top IPOs and raise most proceeds, they also have a broader network of investors than less reputable underwriters (Wang and Yung, 2011). Moreover, the top-tier underwriters have more established relations with their IPO investors, which they can use to successfully manage even low quality offerings.

Hence, if allocation discretion assists underwriters in discouraging investors from flipping their allocation immediately, then this relation should be more pronounced in IPOs managed by high reputation underwriters. This leads to our first sub-hypothesis which argues that:

H_{1a}: For IPOs managed by high reputation underwriters, investors flip their allocation less under bookbuilding in comparison to auction mechanism.

Further, if underwriters in the bookbuilding mechanism do indeed discourage investors from flipping shares, then this should be more prominent in weaker offerings where flipping is a greater concern. Degeorge et al. (2010) find that investors in auction IPOs are equally likely to flip in both cold and hot IPOs, and suggest that this is due to the underwriters' inability to control allocations. This leads to our second sub-hypothesis which argues that:

H_{1b}: In IPOs where the demand is weak, investors flip their allocation less in bookbuilding than in auction IPOs.

The underwriters' network of investors is likely to include both frequent and non-frequent investors. Benveniste and Spindt (1989) show that allocation priority is given to an underwriter's frequent investors as compensation for information revelation. Hence, if repeated interaction between underwriter and investors leads to reduced flipping, then this effect should be more pronounced with frequent investors. This leads to our final sub-hypothesis where we suggest that:

H_{1c}: Frequent investors in bookbuilding IPOs should flip their allocation less than frequent investors in auction IPOs.

Finally, if bookbuilding underwriters are able to allocate shares to long-term investors, then these investors should not only flip less in the immediate aftermarket, but should also hold their shares for a longer period of time. In other words, investors in bookbuilding IPOs should

hold on to their allocation for a longer period of time compared to investors in auction IPOs. This leads to our second main hypothesis that:

H₂: IPO investors retain their allocation for longer periods under bookbuilding in comparison to the auction IPO mechanism.⁵

3. Data and summary statistics

To capture the impact of the change in rules governing the method of IPO flotation, we restrict our sample period to a three year period from January 2004 to December 2006. We collect the initial sample of IPO firms from the Bombay Stock Exchange (BSE) and/or National Stock Exchange (NSE) website. In total, 188 IPOs are issued during this period. We exclude 41 fixed-price offerings because FII rarely subscribe to fixed price IPOs. Also 13 large privatization IPOs are excluded because of their size and the nature of the deals. We exclude a further 21 IPOs because of missing data. Our final sample consists of 103 IPOs which includes 45 bookbuilding and 58 auction IPOs. We hand collect data on firm (assets and age) and offer characteristics (proceeds, shares offered and underwriters) from the offer documents. Data on demand, bids and first day closing stock price are obtained from the BSE/NSE websites. The market-adjusted underpricing is calculated based on the return on the BSE Sensex index.

The data on FII trades are obtained from the SEBI-endorsed National Securities Depository Limited (NSDL) Foreign Portfolio Investor (FPI) Monitor database.⁶ This is a publicly available database that monitors and reports all FII trades from the beginning of January 2003. The database contains several fields, including the FII registration number, scrip name and International Securities Identification Number (ISIN) code, transaction date, transaction type, transaction rate and transaction value (in INRs). The field “transaction type”

⁵ In our empirical analysis, we examine long-term holdings by IPO mechanism for both frequent and non-frequent investors.

⁶ <https://www.fpi.nsdl.co.in/web/Default.aspx>

helps to identify whether a trade is a buy or sell and whether it is a primary or secondary market trade. A total of 3,009 primary trades for our sample of 103 IPOs were found. We use the data from these trades to determine IPO allocations to FII. Since every trade is assigned to a particular FII registration number, we then track trades by the registration number to determine flipping by FII.

We compare the FII allocation data obtained from the NSDL FPI Monitor database with overall IPO allocation data that are publicly available for a large number of our IPOs.⁷ These publicly available data sources provide information on share allocation to the different investor categories, including allocation to FII. We have data for 93 of the 103 IPOs and the data from these two sources are almost identical, ensuring the reliability of our data.

A total of 30 underwriters manage our sample of 103 IPOs. There are 21 underwriters in the bookbuilding regime and 28 in the auction regime. Majority of our IPOs (85 out of the 103) are managed by either one or two underwriters. Since we are interested in the role of underwriter reputation in the two IPO regimes, we consider underwriters as high reputation those who are dominant in both the regimes. To achieve this, we use the market share approach and assign the proceeds raised on a *pro rata* basis to all the lead managers in the IPO. We classify seven underwriters as high reputation who manage 80% and 75% of bookbuilding and auction IPOs respectively. These 7 underwriters also feature among the top five underwriters in each of our three year sample period. Unsurprisingly, these underwriters not only raise the most proceeds but they also manage the majority of the IPOs. Therefore, our classification yields exactly the same outcome if we use the number of offerings instead of the proceeds of the IPOs.

⁷ We gather this allocation data from BSE/NSE websites as well as from other websites, such as chittorgarh.com, which is considered to be the premium IPO portal in India.

[Insert Table 1 here]

Panel A of Table 1 reports summary statistics related to firm and offer characteristics. The key features of allocation and flipping for the full sample, bookbuilding IPOs, and auction IPOs are reported in Panel B. Panel A shows that, generally, bookbuilding IPOs do not differ significantly from auction IPOs in terms of firm (assets and age) and offer characteristics (proceeds, shares offered, underwriter reputation, demand multiple, number of institutional bids, institutional demand multiple, and underpricing). This suggests that although the allocation regime changed midway through our sample period, there is no significant change in the characteristics of the IPO firms. The demand multiple and number of institutional bids appear to be slightly lower in auction IPOs, which can be attributed to bidder exit (as described in Bubna and Prabhala, 2011). Panel B shows that FII receive about 52% of the institutional allocation, which translates to an allocation of about 25% of the total offering. We also find that the allocation to FII is similar across the two regimes. The average size of allocation in the median overall IPO is about 136,000 shares, and we do not find any significant difference in allocation between bookbuilding and auction IPOs.

For the overall sample (column 1), FII flip about 43% of the allocated shares in the first three days of trading. In unreported results, we find that average flipping is 45% in the first seven days and 47% in the first month of listing. Thus, investors who wish to flip their IPO allocations appear to do so in the first few days of listing. The percentage of flipping by FII in Indian IPOs is higher than the weighted average of about 26% reported for institutional investors in US IPOs in Aggarwal (2003).

The estimates in Table 1 show a significant difference in flipping between bookbuilding and auction IPOs. Flipping in the median bookbuilding IPO is 40% in the first three days of trading compared to 52% in the median auction IPO. Thus, the aggregate summary statistics,

consistent with our first hypothesis (H_1), show that bookbuilding investors, on average, appear to flip less than auction investors.

In summary, the three key observations from Table 1 are: (i) both bookbuilding and auction IPOs have similar firm and offer characteristics; (ii) investor demand and overall allocation across the two mechanisms are similar; and (iii) flipping is significantly lower in bookbuilding than in auction IPOs.

4. Investor flipping in bookbuilding versus auction IPOs

Table 2 presents a comparative (univariate) analysis of shares allocated and flipped, based on the full sample (column 1), bookbuilding (column 2), and auction (column 3) IPOs. Given that IPO investors are likely to flip their shares if they receive only a small allocation, perhaps due to rationing caused by high demand (Ellis, 2006), we split the sample into terciles based on shares allocated as a percentage of allocation to FII.⁸

The estimates show that there is a significant difference in the allocation and flipping of shares across the terciles. An investor receives about 0.1% of total FII allocation in the lowest and approximately 2% in the middle tercile. The average investor in the top tercile receives about 11% of the allocation which translates to, on average, a sizeable 2.75% of the total shares on offer.⁹ The allocations are similar in both bookbuilding and auction IPOs. However, there is no systematic pattern between flipping and allocation across the terciles. The average flipping is 36% in the first tercile, 45% in the second and 38% in the third tercile of the full sample. In bookbuilding average flipping appears to be relatively stable across the terciles

⁸ Individual allocations are placed into three categories based on the fraction of shares allocated relative to the total shares offered in the IPO. We also create terciles using alternative approaches – see Section 6.2 for further discussion.

⁹ As discussed earlier, FII receive about 50% of the allocation in the institutional investor category. The institutional investor category, in turn, is allocated about 50% of the total shares on offer.

(insignificant F-statistic). However, it varies significantly in auction IPOs. In auctions, investors within the second tercile flip about 53% of their allocations while it is only 42% in both the first and third terciles. The difference in median flipping is even more dramatic – close to 0% in the first and 61% in the second. More importantly, consistent with the evidence from summary statistics the difference in flipping between bookbuilding and auction IPOs is statistically significant. Further, although the difference is significant in all three terciles, the difference is highest (21%) in the second tercile. Since the investors in the top tercile receive larger allocation (11% on average), even a small proportion of flipping of shares allocated to them is likely to have a much higher economic implication. Overall, the evidence from univariate analysis of flipping provides support to our first hypothesis (H₁) that investors flip less in bookbuilding than in auction IPOs.

[Insert Table 2 here]

Next we compare the level of flipping in multivariate regression framework (in Equation 1) where the possible implications of other factors are controlled for.

$$Fl_i = \alpha + \beta_1 Mechanism_i + \sum_{j=1}^N \gamma_j X_{i,j} + \varepsilon \quad (1)$$

where, the dependent variable (Fl_i) is the proportion of shares flipped by FII_i as a percentage of their allocation within the first three days of listing. The variable of interest is the mechanism dummy that takes the value of 1 for bookbuilding and 0 for auction IPOs. The vector ($X_{i,j}$) represents control variables (institutional demand, market condition, underwriter reputation, IPO proceeds and first day return) that are known to affect flipping. All variables are defined

in Appendix A. The estimates are controlled for industry fixed effects¹⁰ and the results are presented in Table 3.

The estimates for the full sample are given in Specification (1). Specifications (2) – (4) show the results for each of the three IPO allocation terciles. The statistically significant negative coefficient of the mechanism dummy (at 1% level) supports our first hypothesis (H₁) that IPO investors flip less in bookbuilding than in auction IPOs. Investors in bookbuilding flip approximately 7% less than in auction IPOs. Further, this result also holds for the second and third allocation terciles (significant at the 1% level). Although the coefficient on the mechanism dummy is higher in the second tercile (10.6% in comparison to 7.2%), investors in the top tercile receive, on average, almost twice the number of shares than investors in the second tercile. Thus, the economic significance of the difference in flipping across the two mechanisms is higher for the third tercile. The mechanism dummy is insignificant for the bottom tercile, but as this group receives a very small allocation, it is not surprising to see no difference in flipping in the two allocation regimes.

[Insert Table 3 here]

Among the control variables, the institutional demand variable is positive and significant suggesting that investors flip significantly more in IPOs with high demand. However, this relation does not hold for the third tercile. For the full sample the market condition variable is significantly positively related to flipping, although significant only for the top tercile when we consider the three groups. Underwriter reputation, although negative, is not statistically significant for the top two allocation terciles. Flipping is also significantly negatively related to the offer size in all specifications. The coefficient on the first day return

¹⁰ We group IPO firms into 11 industry sectors: consumer discretionary, consumer staples, energy, healthcare, industrials, financials, information technology, utilities, materials and telecommunication services.

variable, although negative for the overall sample, is positive and statistically significant for the top tercile suggesting that investors who receive large allocation usually flip more in hot IPOs.

4.1. Underwriter reputation

To estimate the joint effect of underwriter reputation and the IPO selling methods (hypothesis H_{1a}), we include an interaction term between mechanism and reputation (*Mechanism* × *Reputation*). The results are presented in specifications (5) – (8) of Table 3 where we find that the overall effect of mechanism on flipping remains negative.¹¹ Importantly, the coefficient of the interaction between mechanism and reputation is negative and significant for the full sample and the top two allocation terciles. The estimate in specification (8) suggests that investors in the top tercile flip approximately 13% less in IPOs managed by leading underwriters in bookbuilding compared to auction regime. This provides support for our first sub-hypothesis (H_{1a}) and shows a stronger influence of high reputation underwriters on flipping in bookbuilding IPOs. As the leading underwriters are the same across the two regimes, the results suggest that the influence of high reputation underwriters on flipping is stronger in the bookbuilding regime which can be attributed to their discretionary allocation powers. The control variables have essentially the same results as in specifications (1) – (4).

[Insert Table 4 here]

4.2. Weak IPOs

To test hypothesis H_{1b} we repeat our analysis only on weak IPOs. Following Ellis (2006) we consider IPOs with first day return of 10% or less as weak IPOs.¹² This classification yields 40 weak IPOs with 32 having a negative first day return. There are a total of 677 initial

¹¹ With the introduction of the interaction term, the effect of mechanism on flipping is the sum of the coefficients on mechanism and the interaction term.

¹² See the discussion on alternative specifications of weak IPOs in Section 6.2.

allocations in these 40 IPOs with 266 allocations in bookbuilding and 411 allocations in auction IPOs. The result of this analysis is presented in Table 4. First in specifications (1) – (4), we find that the coefficient on mechanism is negative and statistically significant for the overall sample as well as for the three terciles which suggests that investors flipping in weak IPOs is significantly less in the bookbuilding mechanism. Second, in specifications (5) – (8), the (*Mechanism* × *Reputation*) interaction term is negative and statistically significant for the top two terciles. The estimate in specification (8) suggest that investors who receive allocation in the top tercile in weak IPOs managed by high reputation underwriters flip about 16% less in bookbuilding IPOs compared to auction IPOs. Thus, we not only find that investors in bookbuilding regime flip less in weak IPOs, but they also flip significantly less in weak IPOs that are managed by high reputation underwriters. The evidence is consistent with our hypothesis and the prediction of the bookbuilding theories.

4.3. Frequent and non-frequent investors

In this section we test hypothesis H_{1c} by examining flipping by frequent and non-frequent investors. As in Bubna and Prabhala (2011), the tests are performed at the fund family level as data to track individual bidders across IPOs are not available. Panel A of Table 5 shows that the sample of 3,009 individual IPO bidders belong to 398 fund families; 304 fund families participate in bookbuilding and 243 in auction IPOs. Although several funds participate regularly in Indian IPOs, a large number of fund families seem to be infrequent investors. 187 fund families invest only in one or two IPOs and 162 fund families have participated in three to nine IPOs; only 49 funds invested in ten or more IPOs.

A significant number of bidders who participate in bookbuilding exit in the auction era. Only 149 out of the 304 bookbuilding fund families invest in auction IPOs. However, bidder exit is primarily in the non-frequent investor category. Although only 47 of the 154 fund

families who invest in one or two bookbuilding IPOs invest again in auction IPOs, all of the 44 fund families that invest in ten or more bookbuilding IPOs not only participate in auction IPOs, but participate in them frequently. Thus, frequent bidders in the bookbuilding IPOs continue to participate frequently in the auction regime as well. In bookbuilding IPOs, the median fund family participates in nine IPOs while the 75th percentile bids in 18 IPOs; in auction IPOs, the median (75th percentile) family participates in 15 (28) IPOs.¹³ For the purpose of our analysis, we classify frequent investors as those that belong to families that bid in at least ten IPOs in either of the selling regimes. With this we have 1,649 bids by frequent and 1,360 bids by non-frequent investors. Importantly, by employing this categorization, we have a set of frequent investors that are almost identical in both the selling regimes.¹⁴ Of the 1,649 bids by frequent investors, 819 bids (almost 50%) receive an allocation in the top tercile, 250 bids in the bottom and 580 bids receive allocation in the middle tercile. For non-frequent investors, only about 10% of the total 1,360 bids (144) receive an allocation in the top tercile with 453 bids in the middle and 763 bids receive allocation in the bottom tercile.

[Insert Table 5 here]

Panel B (Table 5) provides a univariate analysis of flipping by frequent and non-frequent investors. The estimates show that frequent investors flip significantly more of their allocation than non-frequent investors (48% versus 31%). This difference in flipping between frequent and non-frequent investors is 19% in bookbuilding IPOs and about 11% in auction IPOs. However, the estimates also show that both frequent and non-frequent investors flip less in bookbuilding than in auction IPOs. Consistent with hypothesis H_{1c}, frequent investors flip

¹³ Our figures are different from those of Bubna and Prabhala (2011), as we use a much larger sample (45 versus 25).

¹⁴ There are five frequent fund families that are new in auction IPOs. For robustness purposes we re-run all our analysis by excluding these family funds. Our results remain qualitatively similar. Also see the section on robustness tests (Section 6), where we discuss alternative specifications of frequent investors.

about 8% less in bookbuilding than in auction IPOs; similarly, non-frequent investors flip about 16% less in bookbuilding IPOs than in auction IPOs. Therefore, the univariate results suggest that the difference in flipping that we observe between bookbuilding and auction mechanisms is consistent for both frequent and non-frequent IPO investors.

Panel C in Table 5 shows that both frequent and non-frequent investors flip less in the top two terciles of the allocation for both bookbuilding and auction IPOs. The median frequent investor in the top (middle) tercile in bookbuilding flips 17% (34%) less than the median investor in auction IPOs. Given that the median frequent investor in the top tercile receives about 6% of total FII allocation, the difference in flipping between the two selling mechanisms is economically significant. For the non-frequent investors, while the median investor in the second tercile holds the entire initial allocation in the bookbuilding mechanism, the median investor in the auction mechanism flips about 28% of the allocation.

[Insert Table 6 here]

We further examine the flipping behavior of frequent and non-frequent investors in a multivariate framework based on equation (1) which is estimated separately for the two investor categories. The results are reported in Table 6.^{15,16} The negative and significant coefficients of ‘mechanism’ in specifications (1) – (3) suggest that the frequent investors flip less in bookbuilding than in auction IPOs. This is consistent with the predictions of hypothesis H_{1c}. This evidence holds for the top two terciles as well. In specifications (4) – (6), we add the (*Mechanism* × *Reputation*) interaction term and find that for the top two terciles, frequent

¹⁵ In unreported results, we repeat the analysis presented in Table 3 by also including the frequent investor dummy variable. We find that the frequent investor variable is positive and significant not only for the overall sample, but also for the top two allocation terciles.

¹⁶ To conserve space, we only report results for the overall sample and the top two terciles. As discussed before, the bottom tercile is relatively less important as the median investor in this tercile receives only 0.1% of the total FII allocation.

investors in bookbuilding IPOs appear to flip less in IPOs that are managed by high reputation underwriters. As indicated by the coefficient of the interaction variable, under bookbuilding, frequent investors flip 16% less if the IPOs are managed by leading underwriters in the bookbuilding regime (specification 6).

In specifications (7) – (12), we repeat the analysis for non-frequent investors. The estimates show a significant negative relation for the overall sample and the 2nd tercile, indicating that non-frequent investors flip less in bookbuilding than in auction IPOs. The average non-frequent investor flips just over 7% less in bookbuilding. However, average investors in the 2nd tercile flip nearly 14% less in bookbuilding IPOs than in auction IPOs. Thus, the analysis in Table 6 shows that both frequent and non-frequent investors flip significantly less in bookbuilding than in auction IPOs. It is noteworthy that none of the interaction terms in specifications (9) – (12) is significant for non-frequent investors. Overall, the effects of the discretionary power of the bookbuilding mechanism which allows the underwriters to target and preferentially allocate shares to long-term holders is also supported by the evidence that even the non-frequent investors flip less in bookbuilding.

We perform a final investigation on flipping by examining investors who hold on to their entire initial IPO allocation at the end of the first three days of listing. We run a probit regression analysis where the dependent variable takes the value of 1 if the investor holds the entire allocation at the end of three days of listing and 0 otherwise. The results are presented in Table 7.¹⁷ First, in specifications (1) – (3), we find that investors in the bookbuilding mechanism are more likely to hold on to their entire allocation at the end of the three days of listing with the results significant for both the top two terciles. Second, in specifications (4) – (7), we also find that the (*Mechanism* × *Reputation*) is significant for the overall sample as

¹⁷ To conserve space, we only report the important results with the complete set of results available from authors on request. We do not report any interaction for non-frequent investors as they are not significant.

well as for frequent investors. Finally, in specification (8) we find that non-frequent investors are also more likely to hold their entire allocation in bookbuilding compared to auction mechanism.

Overall, the results in this section provide a strong support of our hypotheses. We find that investors not only flip less in bookbuilding regime, but they also flip less in IPOs managed by high reputation underwriters as well as in weak IPOs that managed by high reputation underwriters. We further find that both frequent as well as non-frequent investors flip less in the bookbuilding regime with both the set of investors also more likely to hold their entire allocation compared to IPOs in the auction regime. In unreported results, we re-run all the above analysis using data for the first 7 days as well as for the first month of listing and find that all our results are essentially the same.¹⁸

[Insert Table 7 here]

5. Long-term holdings

This section examines H_2 , by analyzing if IPO subscribers retain their allocation for a longer term in bookbuilding than in auction IPOs. If bookbuilding underwriters are able to allocate shares to long-term investors, then they should dispose of less of their allocation over a longer period than the investors in auction IPOs. As in Degeorge et al. (2010), we track each of the 3,009 individual allocations for six months after the IPO listing.¹⁹ Panel A of Table 8 provides a univariate analysis of shares sold by IPO mechanism, relative to the allocation they had received, at the end of six months of listing. The estimates show that the difference in shares sold between bookbuilding and auction IPOs persists at the end of six months at a

¹⁸ These results are available from the authors on request.

¹⁹ The results, available on request, are qualitatively similar when a one year holding period is used.

statistically significant 9%. Much of this difference, however, comes from non-frequent investors; the difference in shares sold across the two mechanisms for frequent investors is 6%.

In Panel B we present the statistics by allocation terciles. For frequent investors, the difference in the fraction of shares sold across the two regimes for the top two terciles narrows over time and also becomes statistically less significant. As for non-frequent investors, the difference in shares sold across the two regimes remains both economically and statistically significant for the middle tercile. The median non-frequent investor in the second allocation tercile holds on to the entire allocation, compared to the median non-frequent investor in the auction regime who disposes of about 76% of the allocation. Taken together, the flipping (section 4) and the long term analysis clearly shows that non-frequent investors appear to be long term in nature compared to frequent investors.

[Insert Table 8 here]

To assess the implications of the IPO mechanism on long-term holdings after controlling for the effects of other factors, equation (2) is estimated as follows:

$$Sold_i = \alpha + \beta_1 Mechanism_i + \sum_{j=1}^N \gamma_j X_{i,j} + \varepsilon \quad (2)$$

In Equation (2), the dependent variable ($Sold_i$) is the percentage of shares sold by investor i within the first six months relative to the allocation received. The vector of control variables ($X_{i,j}$) includes institutional demand, stock return²⁰, underwriters' reputation, IPO

²⁰ In addition to annualized returns (as defined in Appendix A) we also use buy-and-hold returns – annualized returns based on the average daily returns for the first three, four and five months. The results, available on request, are qualitatively similar.

proceeds, and first day return. All variables are defined in Appendix A. We also control for industry fixed effects and the results are presented in Table 9.

Estimates in specifications (1) – (5) and (6) – (7), show that the explanatory power of IPO mechanism weakens for both overall investors as well as frequent investors. IPO mechanism and the (*Mechanism* × *Reputation*) interaction term is still negative and statistically significant for the middle tercile, both the variables, although negative, are insignificant for the top allocation tercile. As for non-frequent investors, consistent with univariate analysis, we find that the difference in shares sold across the two mechanisms is significant for the middle tercile (specification 8) and insignificant for the top tercile (specification 9).

[Insert Table 9 here]

As with flipping, we also perform a probit regression analysis to analyze investors holding their entire allocation at the end of six months of listing. The results are presented in Table 10, where the dependent variable takes the value of 1 if the investor holds on to the entire allocation for six months and 0 otherwise. All explanatory variables remain the same as in equation (2). Overall, investors in bookbuilding regime are more likely to hold their entire allocation six months after listing compared to investors in auction regime (specifications (1) – (3)). However, just as in the results in Table 9, the mechanism variable and the (*Mechanism* × *Reputation*) interaction term is statistically significant only for the middle tercile for the overall and frequent investors. Consistent with our earlier evidence, estimates show that non-frequent investors in the middle tercile are more likely to hold on to their entire allocation in bookbuilding IPOs than in auction IPOs (specification 8).²¹

²¹ In unreported results, we re-run the analysis by using holdings of at least 50% and at least 75% of the initial allocation as the threshold. Our results remain qualitatively similar. Our results also hold when we use investors' holdings at the end of the year of listing.

Overall, the results from the long-term holdings do not entirely support our hypothesis (H₂), particularly for frequent investors who receive high initial allocation. While the analysis on flipping (section 4) clearly show a significant difference in the fraction of allocation sold between bookbuilding and auction IPOs, the difference narrows down considerable over a long term horizon. This is not entirely surprising as frequent investors, by definition, invest frequently in IPOs and hence are less likely to hold on to their high allocations for long. Importantly, however, as there is no significant difference in the fraction of shares sold by frequent investors in the top tercile across the two mechanisms at the end of the six months, it clearly underlines the function of allocation discretion to restrain these investors in flipping their shares quickly in the bookbuilding mechanism, particularly when the IPO is managed by a high reputation underwriter. Another important evidence that emerges from this section is the relatively long term holdings of IPO allocations by non-frequent investors which is again significantly higher in bookbuilding IPOs.

[Insert Table 10 here]

6. Additional Analysis

6.1. Excluding bookbuilding IPOs from regime change overlap period

Our sample of bookbuilding IPOs includes 9 firms that were listed in November and December of 2005. Since the change in allocation regime changed in November 2005, inclusion of these 9 IPOs has the potential to introduce a downward bias in our estimates. An obvious concern is also with long-term analysis, as the six-month period for this sub-sample of IPOs extends into the auction regime. Hence, we re-run all the analysis by excluding the 9 IPOs (of which 6 are managed by high reputation underwriters) and the 162 IPO allocations associated with them.²² First, we find that the average (median) flipping is 50% (50%) for 162

²² Results are available from authors upon request.

initial allocation compared to 30% (0%) for the other bookbuilding allocations (difference statistically significant at the less than 1% level).

Second, the magnitude as well as the statistical significance of the mechanism dummy and the (*Mechanism* × *Reputation*) interaction term is markedly higher across all the regression specifications for the analysis on flipping for the reduced sample. For instance, in the analysis of the overall investors (Table 3), the value (*p*-value) of the mechanism variable (specification 4) and the interaction term (specification 8) is -0.109 (-3.83) and -0.164 (-2.33) respectively. Similarly, for frequent investors (Table 6), the value (*p*-value) of the mechanism variable (specification 3) and the interaction term (specification 6) is -0.095 (-2.89) and -0.204 (-2.55) respectively. We also find similar results for non-frequent investor with the magnitude as well the statistical significance of the mechanism dummy variable markedly higher for the investors in the middle tercile. Overall, this additional analysis further strengthens the evidence that investors in bookbuilding IPOs flip significantly less those in auction IPOs.

6.2. *Alternative specifications*

We investigate the robustness of all empirical results for variations in our specifications. First, instead of using the 10% first day return as the threshold to identify weak IPOs, we use (i) IPOs with negative returns, and (ii) IPOs with returns below the overall median return as alternative measures for weak IPOs. We also use the level of oversubscription (below and above median) to classify IPO issuers with weak demand. All our results remain qualitatively similar to these alternative specifications (the results are available from the authors on request).

Second, to classify the investors into frequent and non-frequent, we use several alternative specifications. Instead of using the cut-off of investing in 10 IPOs, we re-run all our analysis by defining frequent investors as those (i) who participate in at least 18 IPOs (the 75th percentile for bookbuilding IPOs) in each of the selling regimes and (ii) a combined total of at

least 38 IPOs in the two regimes (the 75th percentile for the number of IPOs participated in by fund families in the two regimes – see Panel A, Table 4). Again, all our results remain qualitatively similar.

Finally, we also use alternative approaches to construct allocation terciles. We created terciles based on allocation separately for bookbuilding IPOs and auction IPOs; terciles based on the allocation of each individual IPO; terciles based on shares allocated as a percentage of total institutional quota; and terciles based on shares allocated as a percentage of total offering. All results are qualitatively similar across all the alternative specifications and are available from the authors on request.

7. Conclusion

The discretion available to underwriters in the bookbuilding mechanism to control allocation has been a source of the debate on whether bookbuilding is superior to the auction method of bringing new issues to the market. Despite bookbuilding being a leading mechanism around the world, critics argue that the information extraction benefit of that bookbuilding can also be achieved through alternative mechanisms such as auctions, where the potential for manipulation and abuse is less. However, studies in support of bookbuilding show that the most effective approach to incorporate non-bid information is to allow flexibility in pricing and allocation. The paper contributes to this debate and provides new evidence on the importance of discretion in bookbuilding by examining the flipping behavior of FII across bookbuilding and auction IPOs in India.

In a regime change setting of the Indian market, the findings of the paper are consistent with the theoretical arguments often attached to bookbuilding that underwriters' flexibility in allocation should not only help them to avoid allocation to flippers, but also help develop long-term relationships with IPO investors. We find that both frequent as well as non-frequent

investors flip significantly less in bookbuilding than in auction IPOs. Further, frequent investors, who are almost identical across the two selling regimes and receive the bulk of the allocation, appear to flip significantly less in IPOs managed by leading underwriters (who are also the same in the two mechanisms). They also flip less in weaker IPOs, providing support to both underwriters and issuers. The evidence from the analysis of longer term holdings, post IPO flotation, show that a larger proportion of IPO subscribers hold on to their entire allocation at least for six months from listing in bookbuilding than in auction IPOs.

Overall, our findings, as well as those presented in Bubna and Prabhala (2011), suggest that allocation discretion available to underwriters appears to benefit both issuers and underwriters. Taken together, the evidence suggests that the flexibility in allocation not only helps in improving the pre-market price discovery, but also in influencing the behavior of the frequent investors as well as incorporating soft non-bid information by preferentially allocating shares to long-term investors.

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Appendix A: Definitions

Variable Name	Definition
Mechanism	A dummy variable that take the value of 1 for bookbuilding IPOs and 0 for auction IPOs
Assets (INR Mill)	The book value of total assets at the time of IPO in INR millions.
Age	Difference (in years) between a firm's IPO year and the founding year.
Proceeds (INR Mill)	Gross proceeds of the offer calculated by multiplying the offer price by the number of shares offered.
Shares offered (Mill)	Total number of shares offered in the IPO offering (in millions).
Underwriter reputation	A binary variable which equals 1 for high reputation underwriters and 0 otherwise.
Market condition	The weighted average of the buy-and-hold returns on the BSE Sensex index in the three months prior to the IPO issue opening date t ; the weights being 3 for the month before the IPO date ($Mt-1$), 2 for the month before that ($Mt-2$), and 1 for the third month before the offering ($Mt-3$).
Stock return	Annualized return based on the average daily stock returns for the first six months of listing, excluding the return on the first day of listing
Total demand (oversubscription)	The ratio of total shares bid by all investors to the total number of shares offered.
No of institutional bids	Total number of bids submitted by institutional investors.
Institutional demand	The ratio of total shares bid by the institutional investors to the total number of shares offered to institutional investors.
First day return	The market adjusted first day returns. Market adjusted first day returns is the difference between raw first day return and market return, where the market return is the return on the BSE Sensex index over the same period. Raw first day return is the simple return calculated between the offer price and the closing price at the end of the first day of trading.
Share allocated to FII as a percent of total institutional quota	The percentage of share reserved for institutional investors which is allocated to FII.
Average size of institutional allocation ('000)	The average number of shares allocated to FII
Shares allocated as a percent of total FII allocation	The percentage of shares allocated to each individual investor relative to the total shares offered to all the FII in the IPO.
Shares flipped (sold) as percent of allocation	The percentage of shares allocated which is flipped (sold) in the first three days (six months) of listing.

Frequent FII	A dummy variable that takes the value of 1 for IPO investors who have invested in at least 10 IPOs in both bookbuilding and auction IPOs.
Terciles of allocation	Terciles based on the percentage of shares allocated to FII relative to the total shares allocated to total FII.
Weak IPOs	A dummy variable that takes the value of 1 for IPOs with first day return of 10% or less and 0 otherwise.

Table 1: Summary Statistics

Table 1 reports the summary statistics of the key variables of 103 bookbuilding and auction IPOs listed on the BSE and/or NSE between 2004 and 2006. The statistical significance of the differences in mean (median) is tested using the t-test (Mann-Whitney test). Column 5 (6) provides t-stat and (*p*-values) (z-test (*p*-values)) for the difference in mean (median). Appendix A provides definitions for all the variables.

	Total (1)	Bookbuilding (2)	Auction (3)	Diff (2 – 3) (4)	t-stat (<i>p</i> -value) (5)	z-test (<i>p</i> -value) (6)
<i>Panel A: Firm and offer characteristics</i>						
Assets (INR Million)	5,730 (1,800)	6,664 (1,895)	5,005 (1,766)	1,658 (129)	0.732 (0.466)	0.246 (0.806)
Age	15.24 (12.81)	15.82 (12.00)	14.79 (12.87)	1.034 (-0.87)	0.441 (0.660)	-0.532 (0.594)
Proceeds (INR Million)	2,673 (1,080)	3,435 (1,000)	2,083 (1,090)	1,352 (-90)	1.266 (0.208)	-0.150 (0.881)
Shares offered (Million)	21.56 (8.15)	32.78 (10.00)	12.92 (6.85)	19.86 (3.15)	1.975 (0.051)	2.071 (0.038)
Underwriter reputation	0.68 (1.00)	0.72 (1.00)	0.66 (1.00)	0.06 (0.00)	0.661 (0.510)	0.663 (0.507)
Total demand	23.54 (18.67)	26.31 (22.64)	21.45 (12.42)	4.86 (10.22)	1.148 (0.254)	1.855 (0.063)
Number of institutional bids	122 (86)	148 (97)	106 (71)	42 (26)	1.651 (0.102)	1,962 (0.050)
Institutional demand	25.77 (18.43)	23.31 (18.76)	27.63 (17.44)	-4.32 (1.32)	-0.787 (0.433)	0.185 (0.854)
Underpricing	0.305 (0.22)	0.34 (0.26)	0.28 (0.15)	0.06 (0.11)	0.662 (0.509)	1.579 (0.114)
<i>Panel B: Allocation & Flipping – FII</i>						
Share allocated as a percent of total institutional quota	0.52 (0.53)	0.50 (0.50)	0.54 (0.54)	-0.04 (-0.04)	-1.319 (0.190)	-1.021 (0.307)
Average size of allocation (‘000)	306 (136)	357 (136)	266 (134)	91 (2)	0.925 (0.357)	0.217 (0.624)
Average size of flipping – (‘000)	130 (41)	134 (38)	126 (43)	8 (-5)	0.119 (0.902)	0.497 (0.481)
Shares flipped as a percent of allocation	0.43 (0.45)	0.38 (0.40)	0.47 (0.52)	-0.09 (-0.12)	-1.865 (0.065)	-4.276 (0.033)
Observations	103	45	58			

Table 2: Flipping: Univariate Analysis

Table 2 shows the univariate analysis of flipping in the first three days of listing for 3,009 IPO allocations to FII for a sample of 45 bookbuilding and 58 auction IPOs listed on the BSE and/or NSE between 2004 and 2006. We present statistics for three terciles of allocation based on the percentage of shares allocated to FII. The statistical significance of the differences in mean (median) is tested using the t-test (Mann-Whitney test). Column 5 (6) provides t-stat and (*p*-values) (z-test (*p*-values)) for the difference in mean (median). F-stat (*p*-value) is the test statistic (*p*-value) of the Anova F-test to test for equality across the three allocation categories.

	Overall (1)	Bookbuilding (2)	Auction (3)	Diff (2 – 3) (4)	t-stat (<i>p</i> -value) (5)	z-test (<i>p</i> -value) (6)
<i>Tercile 1 (n=1,003)</i>						
Shares allocated as a percent of total FII allocation	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.000 (0.000)	0.894 (0.371)	1.566 (0.212)
Shares flipped as a percent of allocation	0.36 (0.00)	0.33 (0.00)	0.42 (0.00)	-0.09 (0.00)	-2.908 (0.003)	-4.251 (0.018)
<i>Tercile 2 (n=1,013)</i>						
Shares allocated as a percent of total FII allocation	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)	0.00 (0.00)	1.432 (0.285)	3.248 (0.068)
Shares flipped as a percent of allocation	0.45 (0.35)	0.32 (0.00)	0.53 (0.61)	-0.21 (-0.61)	-6.948 (0.000)	-36.812 (0.000)
<i>Tercile 3 (n=993)</i>						
Shares allocated as a percent of total FII allocation	0.11 (0.06)	0.11 (0.06)	0.10 (0.06)	0.001 (0.002)	0.481 (0.630)	3.236 (0.072)
Shares flipped as a percent of allocation	0.38 (0.17)	0.34 (0.02)	0.42 (0.24)	-0.08 (-0.53)	-4.690 (0.000)	-8.715 (0.000)
Shares allocated a percent - F-stat (<i>p</i> -value)	665.38 (0.000)	351.21 (0.000)	280.72 (0.000)			
Share flipped a percent - F-stat (<i>p</i> -value)	11.68 (0.000)	0.06 (0.943)	11.05 (0.000)			
Observations	3,009	1,403	1,606			

Table 3: IPO Investor Flipping: Overall

Table 3 reports the estimates of the OLS regression analysis of IPO investor flipping in the first three days of listing for 3,009 IPO allocations to FII for a sample of 45 bookbuilding and 58 auction IPOs listed on the BSE and/or NSE between 2004 and 2006. The dependent variable in all the specifications is the fraction of shares sold in the first three days of listing. Appendix A provides definitions of all the variables. All tests use White heteroscedasticity robust standard errors. The p-values are in brackets. ***, ** and * indicate statistically significant at 1%, 5% and 10% respectively.

	Overall (1)	Tercile 1 (2)	Tercile 2 (3)	Tercile 3 (4)	Overall (5)	Tercile 1 (6)	Tercile 2 (7)	Tercile 3 (8)
Mechanism	-0.071*** (-3.87)	0.034 (0.87)	-0.106*** (-3.07)	-0.072*** (-2.67)	0.065 (1.46)	-0.080 (-0.41)	0.048 (0.47)	0.026 (0.45)
Institutional demand	0.070*** (6.16)	0.135*** (4.52)	0.112*** (5.04)	-0.000 (-0.01)	0.058*** (4.87)	0.140*** (4.47)	0.102*** (4.45)	-0.002 (-0.13)
Market condition	0.416* (1.81)	0.447 (0.74)	0.412 (0.94)	0.734** (2.55)	0.540** (2.32)	0.388 (0.63)	0.503 (1.14)	0.744** (2.57)
Underwriter reputation	-0.076*** (-3.31)	-0.085* (-1.83)	-0.041 (-0.82)	-0.005 (-0.16)	0.024 (0.64)	-0.196 (-1.02)	0.067 (0.78)	0.049 (1.07)
Proceeds (log)	-0.051*** (-7.30)	-0.051*** (-3.15)	-0.080*** (-5.57)	-0.059*** (-4.59)	-0.056*** (-7.91)	-0.049*** (-2.95)	-0.085*** (-5.71)	-0.063*** (-4.81)
First day return	-0.044* (-1.81)	-0.358*** (-4.84)	-0.088 (-1.62)	0.072*** (2.61)	-0.021 (-0.82)	-0.364*** (-4.81)	-0.077 (-1.48)	0.082*** (2.88)
Mechanism × Reputation					-0.165*** (-3.40)	0.119 (0.59)	-0.177** (-2.02)	-0.132** (-2.24)
Industry fixed effects	Yes							
Constant	0.658*** (10.84)	0.500** (2.49)	0.772*** (5.83)	0.785*** (8.36)	0.638*** (10.47)	0.582** (2.44)	0.733*** (5.46)	0.780*** (8.30)
Observations	3,009	1,003	1,013	993	3,009	1,003	1,013	993
Adjusted R^2	0.052	0.071	0.090	0.042	0.056	0.071	0.092	0.045

Table 4: IPO Investor Flipping: Weak IPOs

Table 4 reports the estimates of the OLS regression analysis of IPO investor flipping in the first three days of listing only in weak IPOs. We define weak IPOs as those with first day return of 10% or less. The dependent variable in all the specifications is the fraction of shares sold in the first three days of listing. Appendix A provides definitions of all the variables. All tests use White heteroscedasticity robust standard errors. The p-values are in brackets. ***, ** and * indicate statistically significant at 1%, 5% and 10% respectively.

	Overall (1)	Tercile 1 (2)	Tercile 2 (3)	Tercile 3 (4)	Overall (5)	Tercile 1 (6)	Tercile 2 (7)	Tercile 3 (8)
Mechanism	-0.156*** (-4.02)	-0.256** (-2.18)	-0.302*** (-4.33)	-0.078* (-1.92)	0.111 (0.90)	-0.412 (-1.06)	0.457 (1.24)	0.059 (0.47)
Institutional demand	-0.018 (-0.86)	-0.052 (-0.75)	-0.062 (-1.52)	-0.020 (-0.71)	-0.030 (-1.37)	-0.042 (-0.52)	-0.094** (-2.41)	-0.024 (-0.84)
Market condition	1.314*** (4.09)	0.921 (0.63)	1.323* (1.95)	1.550*** (4.24)	1.478*** (4.52)	0.765 (0.46)	1.736** (2.49)	1.605*** (4.33)
Underwriter reputation	-0.141** (-2.09)	-0.261 (-1.09)	-0.108 (-0.49)	-0.145** (-1.97)	-0.036 (-0.43)	-0.389 (-1.61)	0.223 (0.92)	-0.100 (-1.08)
Proceeds (log)	-0.071*** (-3.62)	-0.037 (-0.46)	-0.132*** (-3.47)	-0.073*** (-2.90)	-0.078*** (-3.92)	-0.031 (-0.36)	-0.150*** (-3.90)	-0.077*** (-2.99)
First day return	0.320 (1.31)	-0.446 (-0.70)	0.701* (1.68)	0.184 (0.53)	0.400 (1.64)	-0.489 (-0.72)	0.853** (2.06)	0.227 (0.64)
Mechanism × Reputation					-0.297** (-2.28)	0.170 (0.40)	-0.817** (-2.17)	-0.155* (-1.79)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.125*** (6.85)	1.191* (1.71)	1.772*** (4.84)	1.071*** (5.28)	1.108*** (6.75)	1.244* (1.91)	1.677*** (4.67)	1.067*** (5.27)
Observations	677	105	223	349	677	105	223	349
Adjusted R^2	0.083	0.025	0.121	0.106	0.088	0.016	0.143	0.096

Table 5: Frequent and non-frequent investors: Univariate analysis

Table 5 reports the univariate statistics of flipping in the first three days of listing by frequent and non-frequent IPO investors. Panel A shows statistics of bidding by fund families in the 45 bookbuilding and 58 auction IPOs. Panel B compares flipping by frequent and non-frequent investors between bookbuilding and auction IPO investors while Panel C shows flipping by frequent and non-frequent investors in bookbuilding and auction IPOs for the three allocation terciles. The allocation terciles are based on the percentage of shares allocated to FII. The statistical significance of the differences in mean (median) is tested using the t-test (Mann-Whitney test).

Panel A: Fund family participation in IPOs

	Total	Bookbuilding	Auction
# of fund families bidding in:			
1-2 IPOs	187	154	132
3-9 IPOs	162	106	48
10 or more IPOs	49	44	49
Total	398	304	243
# of IPO bids by fund families			
25 th Percentile	5	4	4
Mean	25	12	17
Median	14	9	15
75 th Percentile	38	18	28

Panel B: By mechanism and investors

	Overall (1)	Frequent Investors (2)	Non-Frequent Investors (3)	Diff 2-3 (4)	t-stat (<i>p</i> -value) (5)	z-test (<i>p</i> -value) (6)
Shares flipped as a percent of allocation – Overall	0.40 (0.05)	0.48 (0.48)	0.31 (0.00)	0.17 (0.48)	10.456 (0.000)	111.54 (0.000)
Shares flipped as a percent of allocation – Bookbuilding	0.33 (0.00)	0.43 (0.27)	0.24 (0.00)	0.19 (0.27)	6.897 (0.000)	54.08 (0.000)
Shares flipped as a percent of allocation – Auction	0.46 (0.36)	0.51 (0.52)	0.40 (0.00)	0.11 (0.55)	5.216 (0.000)	26.31 (0.000)
Diff (Bookbuilding – Auction)	-0.13 (-0.36)	-0.08 (-0.25)	-0.16 (0.00)			
t-stat (<i>p</i> -value)	-8.144 (0.000)	-3.422 (0.000)	-5.675 (0.000)			
z-test (<i>p</i> -value)	53.64 (0.000)	9.886 (0.001)	18.583 (0.000)			
Observations	3,009	1,649	1,360			

Panel C: By mechanism, investors and allocation terciles

	Frequent Investors				Non-Frequent Investors			
	Bookbuilding (1)	Auction (2)	Diff (1-2) (3)	<i>p</i> -values (4)	Bookbuilding (5)	Auction (6)	Diff (5-6) (7)	<i>p</i> -values (8)
Shares flipped as a percent of allocation								
Tercile 1	0.51 (0.50)	0.57 (0.94)	-0.06 (-0.44)	0.295 (0.322)	0.26 (0.00)	0.37 (0.00)	-0.11 (0.00)	0.001 (0.009)
Tercile 2	0.45 (0.34)	0.57 (0.68)	-0.12 (-0.34)	0.004 (0.005)	0.21 (0.00)	0.46 (0.28)	-0.25 (-0.28)	0.000 (0.000)
Tercile 3	0.38 (0.16)	0.45 (0.33)	-0.07 (-0.17)	0.006 (0.002)	0.19 (0.00)	0.25 (0.00)	-0.06 (0.00)	0.245 (0.022)
Observations	661	988			742	618		

Table 6: Frequent and non-frequent investors: OLS regression analysis

Table 6 reports the estimates of the OLS regression analysis of flipping in the first three days of listing for 3,009 IPO allocations to FII for a sample of 45 bookbuilding and 58 auction IPOs listed on the BSE and/or NSE between 2004 and 2006. The dependent variable in all the specifications is the fraction of shares sold in the first three days of listing. Appendix A provides definitions of all the variables. All tests use White heteroscedasticity robust standard errors. The p-values are in brackets. ***, ** and * indicate statistically significant at 1%, 5% and 10% respectively.

	Frequent Investors						Non-Frequent Investors					
	Overall (1)	Tercile 2 (2)	Tercile 3 (3)	Overall (4)	Tercile 2 (5)	Tercile 3 (6)	Overall (7)	Tercile 2 (8)	Tercile 3 (9)	Overall (10)	Tercile 2 (11)	Tercile 3 (12)
Mechanism	-0.055** (-2.40)	-0.058* (-1.78)	-0.062** (-2.03)	0.050 (0.96)	0.122 (1.01)	0.055 (0.86)	-0.072** (-2.30)	-0.136** (-2.54)	-0.061 (-1.12)	0.039 (0.33)	-0.098 (-0.44)	-0.038 (-0.24)
Institutional demand	0.051*** (3.47)	0.108*** (3.59)	0.008 (0.43)	0.044*** (2.91)	0.097*** (3.14)	0.006 (0.29)	0.097*** (4.56)	0.086** (2.50)	-0.052 (-1.24)	0.090*** (4.06)	0.085** (2.42)	-0.052 (-1.23)
Market condition	0.503* (1.87)	0.314 (0.61)	0.743** (2.30)	0.549** (2.03)	0.413 (0.79)	0.729** (2.24)	0.633 (1.45)	0.661 (0.90)	0.866 (1.45)	0.720 (1.62)	0.673 (0.91)	0.883 (1.42)
Underwriter reputation	-0.012 (-0.40)	-0.052 (-0.79)	-0.007 (-0.16)	0.050 (1.21)	0.060 (0.63)	0.052 (1.06)	-0.160*** (-4.04)	-0.055 (-0.71)	-0.047 (-0.66)	-0.060 (-0.53)	-0.022 (-0.10)	-0.031 (-0.21)
Proceeds (log)	-0.015 (-1.37)	-0.034 (-1.54)	-0.040** (-2.52)	-0.018 (-1.61)	-0.040* (-1.77)	-0.042*** (-2.65)	-0.034*** (-2.82)	-0.084*** (-3.76)	-0.051* (-1.94)	-0.037*** (-3.03)	-0.084*** (-3.73)	-0.053* (-1.88)
First day return	0.029 (1.07)	-0.110 (-1.58)	0.067** (2.20)	0.042 (1.48)	-0.102 (-1.47)	0.076** (2.47)	-0.113** (-2.09)	0.003 (0.04)	0.149** (2.45)	-0.099* (-1.77)	0.004 (0.06)	0.152** (2.26)
Mechanism × Reputation				-0.135** (-2.28)	-0.216* (-1.95)	-0.159** (-2.18)				-0.121 (-0.99)	-0.041 (-0.18)	-0.029 (-0.16)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.411*** (5.06)	0.477*** (2.76)	0.648*** (5.78)	0.399*** (4.91)	0.457*** (2.65)	0.629*** (5.61)	0.430*** (3.17)	0.804*** (3.50)	0.748*** (3.32)	0.380** (2.57)	0.781*** (2.89)	0.751*** (3.35)
Observations	1649	580	819	1649	580	819	1360	453	144	1360	453	144
Adjusted R ²	0.032	0.042	0.044	0.048	0.045	0.050	0.070	0.117	0.060	0.070	0.115	0.055

Table 7: IPO Investor Flipping: Probit regression analysis

Table 7 reports the estimates of the probit regression analysis of flipping in the first three days of listing for 3,009 IPO allocations to FII for a sample of 45 bookbuilding and 58 auction IPOs listed on the BSE and/or NSE between 2004 and 2006. The dependent variable in all the specifications takes the value of 1 if investors hold their entire allocation at the end of the first three days of listing and 0 otherwise. Appendix A provides definitions of all the variables. All tests use White heteroscedasticity robust standard errors. The p-values are in brackets. ***, ** and * indicate statistically significant at 1%, 5% and 10% respectively.

	Overall					Frequent Investors		Non-Frequent Investors	
	Overall (1)	Tercile 2 (2)	Tercile 3 (3)	Tercile 2 (4)	Tercile 3 (5)	Tercile 2 (6)	Tercile 3 (7)	Tercile 2 (8)	Tercile 3 (9)
Mechanism	0.208*** (3.98)	0.340*** (3.45)	0.179** (2.12)	-0.168 (-0.62)	-0.149 (-0.88)	-0.345 (-1.03)	-0.296 (-1.55)	0.440*** (2.78)	0.250 (1.18)
Institutional demand	-0.182*** (-5.36)	-0.357*** (-5.13)	-0.069 (-1.22)	-0.325*** (-4.57)	-0.062 (-1.10)	-0.444*** (-4.51)	-0.064 (-1.04)	-0.152 (-1.42)	-0.084 (-0.51)
Market condition	-1.029 (-1.56)	0.068 (0.05)	-2.553*** (-2.66)	-0.246 (-0.19)	-2.579*** (-2.69)	1.182 (0.74)	-2.775*** (-2.60)	-2.578 (-1.18)	-2.239 (-0.87)
Underwriter reputation	0.122* (1.89)	0.076 (0.53)	-0.129 (-1.23)	-0.283 (-1.26)	-0.314** (-2.36)	-0.265 (-1.04)	-0.315** (-2.18)	0.152 (0.63)	-0.037 (-0.14)
Proceeds (log)	0.127*** (5.94)	0.143*** (3.09)	-0.023 (-0.51)	0.158*** (3.32)	-0.010 (-0.21)	0.050 (0.72)	-0.116** (-2.05)	0.086 (1.18)	-0.038 (-0.38)
First day return	0.206*** (3.02)	0.392** (2.49)	-0.225** (-2.56)	0.355** (2.25)	-0.257*** (-2.89)	0.542** (2.47)	-0.272*** (-2.81)	-0.033 (-0.14)	-0.346 (-1.52)
Mechanism × Reputation				0.584** (2.02)	0.446** (2.25)	0.695* (1.90)	0.560** (2.52)		
Industry fixed effects	Yes	Yes							
Constant	0.606** (2.49)	0.576 (1.11)	1.098*** (2.87)	0.644*** (2.66)	0.635 (1.23)	0.398 (0.98)	-0.090 (-0.13)	0.038 (0.05)	1.114 (1.34)
Observations	3,009	1,013	993	1,013	993	580	819	453	144
Pseudo R ²	0.032	0.063	0.022	0.066	0.026	0.063	0.035	0.056	0.031

Table 8: Long-term IPO holdings: Univariate analysis

Table 8 reports the univariate statistics of the fraction of shares sold in the first six months of listing. Panel A compares the fraction of shares sold by frequent and non-frequent investors between bookbuilding and auction IPO investors, while Panel C shows the fraction of shares sold by frequent and non-frequent investors in bookbuilding and auction IPOs for the three allocation terciles. The allocation terciles are based on the percentage of shares allocated to FII. The statistical significance of the differences in mean (median) is tested using the t-test (Mann-Whitney test).

Panel A: By mechanism and investors

	Overall (1)	Frequent Investors (2)	Non-Frequent Investors (3)	Diff (2-3) (4)	t-stat (<i>p</i> -value) (5)	z-test (<i>p</i> -value) (6)
Shares sold as a percent of allocation – Overall	0.47 (0.38)	0.54 (0.57)	0.39 (0.00)	0.15 (0.57)	7.702 (0.000)	68.64 (0.000)
Shares sold as a percent of allocation – Bookbuilding	0.42 (0.15)	0.50 (0.52)	0.32 (0.00)	0.18 (0.52)	6.189 (0.000)	37.01 (0.000)
Shares sold as a percent of allocation – Auction	0.51 (0.57)	0.56 (0.69)	0.46 (0.00)	0.11 (0.69)	5.237 (0.000)	19.56 (0.000)
Diff (Bookbuilding – Auction)	-0.09 (-0.42)	-0.06 (-0.17)	-0.14 (0.00)			
t-stat (<i>p</i> -value)	-5.25 (0.000)	-2.46 (0.014)	-3.274 (0.000)			
z-test (<i>p</i> -value)	20.84 (0.000)	4.077 (0.035)	6.914 (0.000)			
Observations		1,649	1,360			

Panel B: By mechanism, investors and allocation terciles

	Frequent Investors				Non-Frequent Investors			
	Bookbuilding (1)	Auction (2)	Diff (1-2) (3)	<i>p</i> -values (4)	Bookbuilding (5)	Auction (6)	Diff (5-6) (7)	<i>p</i> -values (8)
Shares sold as a percent of allocation								
Tercile 1	0.83 (1.00)	0.66 (1.00)	0.17 (0.00)	0.311 (0.881)	0.41 (0.00)	0.42 (0.00)	-0.01 (0.00)	0.799 (0.895)
Tercile 2	0.55 (0.59)	0.62 (0.82)	-0.07 (-0.23)	0.069 (0.212)	0.29 (0.00)	0.52 (0.76)	-0.23 (-0.76)	0.000 (0.000)
Tercile 3	0.46 (0.38)	0.51 (0.50)	-0.05 (-0.12)	0.145 (0.154)	0.32 (0.00)	0.32 (0.00)	0.00 (0.00)	0.999 (0.154)
Observations	661	988			742	618		

Table 9: Long-term holdings: OLS regression analysis

Table 9 reports the estimates of the OLS regression analysis of the fraction of shares sold in the first six months of listing for 3,009 IPO allocations to FII for a sample of 45 bookbuilding and 58 auction IPOs listed on the BSE and/or NSE between 2004 and 2006. The dependent variable in all the specifications is the fraction of shares sold in the first six months of listing. Appendix A provides definitions of all the variables. All tests use White heteroscedasticity robust standard errors. The p-values are in brackets. ***, ** and * indicate statistically significant at 1%, 5% and 10% respectively.

	Overall					Frequent Investors		Non-Frequent Investors	
	Overall (1)	Tercile 2 (2)	Tercile 3 (3)	Tercile 2 (4)	Tercile 3 (5)	Tercile 2 (6)	Tercile 3 (7)	Tercile 2 (8)	Tercile 3 (9)
Mechanism	0.004 (0.17)	-0.096*** (-2.68)	-0.019 (-1.28)	0.060 (0.59)	0.038 (0.65)	0.188 (1.61)	0.063 (0.97)	-0.174*** (-2.95)	0.008 (0.12)
Institutional demand	0.104*** (7.98)	0.116*** (5.26)	0.022 (1.28)	0.107*** (4.73)	0.021 (1.22)	0.091*** (2.93)	0.033* (1.68)	0.092*** (2.80)	-0.053 (-1.40)
Stock return	0.019 (1.29)	0.042** (2.17)	-0.079*** (-4.76)	0.043** (2.28)	-0.076*** (-4.58)	0.010 (0.41)	-0.078*** (-4.18)	0.101*** (3.09)	-0.071* (-1.91)
Underwriter reputation	-0.088*** (-3.29)	-0.074 (-1.39)	-0.017 (-0.49)	0.036 (0.41)	0.015 (0.32)	0.069 (0.71)	0.027 (0.56)	-0.129 (-1.57)	-0.099 (-1.16)
Proceeds (log)	-0.050*** (-6.14)	-0.085*** (-5.68)	-0.067*** (-4.80)	-0.089*** (-5.84)	-0.069*** (-4.91)	-0.044* (-1.91)	-0.051*** (-3.03)	-0.082*** (-3.57)	-0.071** (-2.41)
First day return	-0.008 (-0.33)	0.001 (0.01)	0.037 (1.37)	0.013 (0.23)	0.042 (1.54)	0.007 (0.08)	0.026 (0.86)	0.096 (1.20)	0.187*** (3.88)
Mechanism × Reputation				-0.182** (-2.06)	-0.079 (-1.16)	-0.264** (-2.06)	-0.109 (-1.46)		
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.609*** (7.56)	0.876*** (6.42)	0.883*** (8.90)	0.837*** (6.03)	0.882*** (8.87)	0.543*** (3.02)	0.730*** (6.26)	0.910*** (3.93)	1.055*** (4.36)
Observations	3,009	1,013	993	1,013	993	580	819	453	144
Pseudo R ²	0.031	0.091	0.056	0.094	0.057	0.034	0.041	0.135	0.114

Table 10: Long-term holdings: Probit regression analysis

Table 10 reports the estimates of the probit regression analysis of the fraction of shares sold in the first six months of listing for 3,009 IPO allocations to FII for a sample of 45 bookbuilding and 58 auction IPOs listed on the BSE and/or NSE between 2004 and 2006. The dependent variable in all the specifications takes the value of 1 if investors hold their entire allocation at the end of six months and 0 otherwise. Appendix A provides definitions of all the variables. All tests use White heteroscedasticity robust standard errors. The p-values are in brackets. ***, ** and * indicate statistically significant at 1%, 5% and 10% respectively.

	Overall					Frequent Investors		Non-Frequent Investors	
	Overall (1)	Tercile 2 (2)	Tercile 3 (3)	Tercile 2 (4)	Tercile 3 (5)	Tercile 2 (6)	Tercile 3 (7)	Tercile 2 (8)	Tercile 3 (9)
Mechanism	0.100** (2.14)	0.255** (2.50)	0.096 (1.28)	-0.260 (-0.94)	-0.126 (-0.73)	-0.692* (-1.92)	-0.278 (-1.41)	0.455*** (2.65)	0.250 (1.15)
Institutional demand	-0.231*** (-7.28)	-0.388*** (-5.78)	-0.103* (-1.89)	-0.359*** (-5.24)	-0.099* (-1.81)	-0.436*** (-4.53)	-0.121** (-2.00)	-0.224** (-2.22)	0.035 (0.23)
Stock return	-0.097*** (-2.92)	-0.167*** (-2.76)	0.098* (1.87)	-0.175*** (-2.89)	0.088* (1.66)	-0.128 (-1.59)	0.118** (1.97)	-0.257*** (-2.62)	-0.012 (-0.10)
Reputation	0.150** (2.24)	0.168 (1.13)	-0.073 (-0.71)	-0.190 (-0.84)	-0.197 (-1.51)	-0.295 (-1.14)	-0.215 (-1.53)	0.293 (1.20)	0.154 (0.62)
Proceeds (log)	0.131*** (6.25)	0.170*** (3.72)	-0.035 (-0.75)	0.184*** (3.91)	-0.024 (-0.52)	0.096 (1.38)	-0.128** (-2.23)	0.097 (1.35)	-0.035 (-0.35)
First day return	0.097 (1.51)	0.236 (1.53)	-0.174* (-1.95)	0.192 (1.24)	-0.195** (-2.17)	0.364* (1.66)	-0.172* (-1.79)	-0.188 (-0.83)	-0.634** (-2.31)
Mechanism × Reputation				0.600** (2.04)	0.308 (1.62)	0.933** (2.39)	0.419* (1.84)		
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.690*** (-3.91)	-0.594 (-1.53)	0.297 (0.93)	-0.472 (-1.22)	0.302 (0.94)	0.355 (0.68)	1.040*** (2.68)	-0.319 (-0.48)	0.234 (0.30)
Observations	3,009	1,013	993	1,013	993	580	819	453	144
Pseudo R^2	0.029	0.067	0.016	0.070	0.017	0.062	0.028	0.067	0.030