

## **Investor Sentiment, Profitability and Offer Price Band: Evidence from the Indian IPO Market**

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*Offer price band is a crucial component of the book building process in the Initial Public Offering process of a firm. Extant research shows that investor sentiment plays a prominent role in IPO markets. We therefore suggest that investor sentiment plays a significant role in determining the offer price range. The determinants of offer price band have not been studied in the IPO literature. We fill this lacuna by studying the Indian IPO market. We hypothesise that investor sentiment will positively influence offer price band. We also posit that the profitability of a firm will be inversely related to the offer price band. Our empirical tests support these hypotheses.*

**JEL Codes:** G14 G18 G24

### **1. Introduction**

The making of an initial public offering (IPO) of a firm's equity represents a key milestone in a firm's lifecycle. During the process of making an IPO, a firm with the help of investment banks has to make several important decisions. Principal among them is the price at which the offer is made. Typically, the issue manager arrives at the price based on demand information that the issue manager acquires from prospective investors. This pricing process critically depends upon the offering mechanism. Bookbuilding is the predominant offering mechanism that is used in the U.S. and several developed and emerging financial markets (Sherman 2005). The process of bookbuilding starts with the investment bank announcing a price range. The investment banker uses this price range to solicit bids from the potential investors. Potential investors indicate the price they are willing to pay and the number of shares that they are willing to purchase at that price to the investment bankers. After receiving all the bids, the investment banker aggregates all the bids to arrive at the demand curve. The price is set such that the total demand is larger than the number of shares offered.

The price band is therefore a critical variable in the bookbuilding process of IPOs. It forms the basis for soliciting bids from potential investors. The price band facilitates price discovery. If the market clearing price exceeds the upper bound, there will be excess demand. The issuer can then revise the price range and reopen the book building process. If the market clearing price is below the lower bound, then the issue will fail due to lack of demand. The issuer could then reoffer the issue by revising the price range. Thus, it is critical to carefully set the price band so that it includes the market clearing price.

Although several researchers have used offer price range<sup>i</sup> to explain offer price adjustment and initial listing return (Hanley, 1993; Gao, 2010), there is as yet no work on

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the determinants of the price range which is essential to commence the bookbuilding process. Therefore, in this paper, using data from the Indian IPO market, we examine the factors that determine the price range in a bookbuilding process.

The factors that determine the price band in an IPO has not been examined and therefore forms the basis of this study. We contribute to the literature by considering potential factors that affect the price band such as the profitability of firm, and demand uncertainty. We hypothesise that the price band will be positively related to investor demand uncertainty. We also posit that the offer price band will be inversely related to the profitability of the IPO issuing firm.

Our empirical results show that investor demand has a significant positive impact on offer price range. Since in the Indian market, investor sentiment drives the demand it is subject to sudden unexpected fluctuation. Thus investor demand proxies for uncertainty and is therefore positively related to offer price band. We also find that profitability has a negative effect on offer price range. This is because firms with strong fundamentals have lower risk of under subscription. Thus issuers set a narrower price range prior to the book building process.

### 1.1 Institutional Setting

India has two major stock exchanges - the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). Currently, market forces play a significant role in the capital issuance process in India. Initially, IPOs in India were offered only via a fixed price mechanism. The regulators sanctioned the use of bookbuilding for IPOs in September 1999. Currently both bookbuilding and fixed price mechanisms are used in the IPOs although bookbuilding is the more popular choice among issuers.

Regulatory changes have brought the issuance process similar to that of developed markets. We describe the IPO issuance process in India below.

### 1.2 The Issuance Process

The first task of the firm conducting an IPO is to select its investment banker, also known as the Book Running Lead Manager (bookrunner) in Indian parlance. The bookrunner initially files a Draft Red Herring Prospectus (DRHP) which contains all relevant information pertaining to the issue except the price with the regulator. The bookrunner arrives at a tentative price based on the prospects of the issuing firm and market conditions. The bookrunner then conducts the road show targeting its institutional client base and arrives at a price band. The bookrunner then files the Red Herring Prospectus (RHP), which contains the pricing band, with SEBI. The price band is the basis of the book building process.

The price band provides a minimum and maximum price – the range within which the final offer price will lie. The pricing band could be adjusted upward or downward based on demand. By regulation, the maximum price in the band cannot exceed 120% of the minimum price of the band. In the US difference between the minimum and maximum price in filing price range is almost always USD 2. Whereas in the US the filing range may be revised many times, in India the price band is almost never revised upwards and sometimes revised downwards in the face of low demand.

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After filing the RHP, the bookrunner forms a syndicate of brokers/banks/financial service providers to perform the book building exercise. Regulators have categorized investors into three classes for the purpose of IPO allocation – Qualified Institutional Buyers (QII's), Non-institutional Investors (NII's) and Retail Investors (RII's). The QII's are to be allocated no more than 50% of the offered shares. Each retail investor is allowed to invest a maximum of INR 100,000 and collectively retail investors should be allocated a minimum of 35% of the offered shares. NIIs are essentially retail investors who invest more than INR 100,000 in an issue and are collectively allocated 15% of the shares. Thus in every issue retail investors are guaranteed a minimum of 50% of the shares offered.

The book building period typically lasts for 5 days with a minimum of 3 days and a maximum of 10 days as ordained by the regulator. All classes of investors have to place their bids only through the syndicate. The bids may be modified during the book building period. The bids are electronically entered by the syndicate members and transmitted to the Bombay and National Stock Exchanges through a satellite network. After the completion of the bookbuilding period, the bookrunner in consultation with the managers of the issuing firm decide on the offer price. If the issue is oversubscribed for any category of investors, then pro-rata allocation is made by means of a lottery. It is the responsibility of the stock exchanges to ensure that the allocation is conducted in an impartial manner.

The rest of the paper is organized as follows. In the next section, we review the relevant literature and develop our hypotheses. In section 3, we describe the methodology and formulation of our models. Our empirical results are contained in section 4. The final section concludes and presents a summary of results.

## 2. Literature Review

Ljungqvist (2005) surveys the rich and extensive IPO literature. The auction and book building methods are the most common mechanisms for allocating IPOs to investors. The bookbuilding method dominates the auction method in most markets around the world (Sherman, 2005). In the bookbuilding method, the investment bank announces an indicative price range for the equity offering and invites investors to submit bids. Three types of bids are commonly used. A "strike" bid is a bid for a specified quantity of shares or an amount of money regardless of price. In a "limit" bid, the bidder specifies the maximum price that she is willing to pay for the shares. In a "step" bid, the bidder submits a demand schedule as a step function. Thus, a step bid is a combination of limit bids.

After collecting the bids, the underwriter aggregates them into a demand curve and sets the issue price. In general, the issue price is not fixed at the point where aggregate demand equals supply. Typically, the underwriter chooses an offer price at her discretion that is below the market clearing price. This constitutes deliberate underpricing by the underwriter and is characterized as a partial adjustment. The offer price set by the investment banker need not be within the initial price range. Investment bankers may price the issue either below or above the price range based on investor demand revealed during the bookbuild process. Setting the offer price below the range is considered an embarrassment to the investment banker while an offer price exceeding the upper limit of the range is disliked by the institutional investors.

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Based on our discussions above, it appears that that we must consider the price range for the bookbuild process. A wide price range reveals a high degree of uncertainty prior to bookbuilding and should therefore be included as a potential factor that affects the initial listing returns. Surprisingly, there are no studies that specifically examine the offer price range. We contribute to the academic literature on IPOs by explicitly examining the determinants of offer price range.

The width of the offer price range can be considered to be a measure of the ex-ante risk of an IPO (Hanley 1993). There are two sources of risk that we consider in this paper. First is the risk of under subscription due to poor investor demand. Recent empirical work shows that investor sentiment plays a key role in the success of an IPO. Dorn (2003) shows empirical results consistent with the view that retail buyers consistently overpay for IPOs in the when-issued IPO market in Germany. The willingness to overpay on the part of retail investors is indicative of sentiment as a driver of retail trading activity. Likewise the work of Cornelli et al. (2006) indicates that retail investor sentiment drives first day returns of IPOs in twelve European countries. Gao (2010) shows market sentiment is a key driver of initial returns in the Chinese IPO market. There is also evidence that issuers time the issuance of IPOs when the sentiment demand is strong (Ritter, 1984, 1991; Baker and Wurgler, 2000; Loughran et al., 1994; Lee et al., 1991). The Indian IPO market is dominated by retail investors (Marisetty and Subrahmanyam 2010). However, there are no studies in an emerging market setting on the role of investor sentiment on offer price range.

Sentiment driven demand is also risky. In fast moving market conditions, sentiment demand may dry up suddenly exposing the issuer to the risk of under subscription in an IPO. Therefore, we posit that issuers will set a higher offer price range to preclude the risk of under subscription. More formally, we state our hypothesis H1 below:

**H1:** Offer price range will be positively associated with retail investor demand.

We operationalise empirical tests of H1 by using Indian Investor demand ratios representing the number of times the issue was subscribed to as broken down by three major groups; Qualified Institutional Buyers (QII's), Non Institutional Investors (NII's); and Retail Individual Investors (RII's).

The second source of risk is the future viability of the firm. Following the work of Purnanandam and Swaminathan (2003) we use measures of profitability to assess the potential viability of the firm issuing IPO. We propose that highly profitable firms will be priced at a higher level and that market participants will be willing to pay a higher price for the IPO. Also, there will be a lower level of uncertainty regarding the subscription of the IPO. Due to this lower risk of under subscription, we argue that issuers will set a smaller price range while offering the shares to the investors during the book building period. We therefore posit our second hypothesis H2 below:

**H2:** Offer price range will be inversely related to the profitability of the firm making the IPO.

We operationalise empirical tests of H2 by using profitability measures such as Return on Shareholders funds (RSH) and Return on Shareholders funds in previous year (RSH-1).

### 3. The Methodology and Model

Our sample is drawn from IPOs issued in India between January 2007 and December 2012 inclusive using the bookbuilding process and comprised a total of 268 Book building IPOs. Of these, we reconciled some 116 companies from [www.chittorgarh.com/ipo](http://www.chittorgarh.com/ipo) who had issued 100% Book Building IPOs during this period and for which detailed information on the bookbuild IPO was obtained. We excluded IPOs that were FP (fixed price) and also Bookbuilding IPOs that had allocations reserved for employees as our study was based on subscription driven by demand. The information collected on the IPO included the date of issue opening, issue size (in both equity shares and INR), the issue price (range) of the book build, the Indian stock exchanges in which the issue was conducted (BSE, NSE) along with listing day information from both exchanges, the CARE grade issued to the company conducting the IPO, and the ratio of number of times the issue was subscribed to as broken down by three major groups;

- a) Qualified Institutional Buyers (QII's);
- b) Non Institutional Investors (NII's); and
- c) Retail Individual Investors (RII's).

A summary of the descriptive statistics for variables such as offer price range, midpoint of offer range, actual offer price and total proceeds are shown in Table 1. We split the sample on the basis of whether the final offer price is less than or greater than the range midpoint and report the statistics in columns 3 and 4. We label these subsamples DOWN and UP for expositional ease. The UP subsample experienced upward offer price revisions while the DOWN subsample suffered downward offer price revisions.

For the overall sample, we find that the average dollar width of offer price is INR 19.36 with a median of 10. It appears that there are a few issues with high offer price range skewing the distribution to the right. The dollar midpoint of offer price range is INR 201.55 with a median of 137.50. The mean actual offer price is INR 206.59 and exceeds the dollar midpoint of offer price range. Thus it appears that investment bankers price the issue taking into account the demand revealed during the bookbuild process. 29.3% of the sample had a final offer price that was less than the midpoint of offer price range and falls into the DOWN subsample. Ostensibly, the DOWN subsample experienced poorer demand during the bookbuild process.

The average value of dollar width of the DOWN subsample is INR 14.62 and is lower than the average for the UP subsample which is 21.33. Thus it appears that firms which are not confident of doing well in the market place set a lower offer price range. On the other hand, the UP subsample firms have higher average offer price range allowing them to set higher final offer prices reflecting investors' demand revealed during the bookbuild process. Interestingly, the width of offer price range has a mean of 10.75% and median of 10%, much lower than the 20% allowed by regulators.

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**Table 1: Mean descriptive statistics on sample of 116 Indian IPOs issued from January 2007 to December 2012.**

	All IPOs	Final Offer Price less than range midpoint (DOWN)	Final Offer Price greater than range midpoint (UP)	T test statistics
No of Issues	116	34	82	
Percent of Sample	100	29.3%	70.7%	
Dollar Width of Offer range <sup>ii</sup> (H-L)	INR 19.36 (10)	INR 14.62 (10.00)	INR 21.33 (12.50)	1.6144
Percentage width of Offer range	10.75% (10%)	9.49% (8.96%)	11.28% (10.81%)	1.7656
Dollar Midpoint <sup>iii</sup> of Offer range (M)	INR 201.55 (137.50)	INR 177.25 (142.00)	INR 211.63 (135.00)	0.8358
Actual Offer Price	206.59 (137.50)	170.79 (135.00)	221.43 (142.50)	1.1913
Total Proceeds (INR Millions)	3899.80 (1155.00)	4972.20 (2015.00)	3455.10 (994.70)	-0.6342 <sup>iv</sup>

A frequency distribution of the range of book builds in IPOs, as shown in Figure 1, clearly shows a concentration towards the lower end signifying a perhaps over cautionary approach when setting the initial range for the IPO. Using Osiris database, data on financial variables of interest were obtained for the years 2007 – 2012 to compare with the list of IPOs. The financial information collected on the IPO included return on shareholders' funds in the current year as well as previous year, the earnings per share in the current year and previous year, and the current ratio. From this database, a final sample of 49 IPOs was obtained in which data from the Osiris databank and the data from [www.chittorgarh.com/ipo](http://www.chittorgarh.com/ipo) was verified and comparable. No significant difference on means between the sample of 49 IPOs and the 116 initial selection was found supporting the use of this sample as representative of the population of interest<sup>v</sup>.

To test our hypotheses, we ran OLS regression models (reporting White heteroskedasticity-consistent standard errors) on determinants of offer price range using variables that capture investor demand and profitability as independent variables with several control variables. Our models were therefore formulated as follows:

Offer Price Range = f (investor demand, profitability) with control variables

The dependent variable is offer price range which is defined as (H-L) where H and L are the highest and lowest anticipated values of offer price as quoted in the preliminary prospectus.

Table 3 shows our model related to investor demand such that:

Offer Price Range = f (Investor demand proxied with ratio of number of times the issue was subscribed to as broken down by Qualified Institutional Buyers (QII's), Non Institutional Investors (NII's); and Retail Individual Investors (RII's). Total proceeds measured in CRORE<sup>vi</sup> and Current Ratio (CR) were used as control variables. Models (1), (2), (3) introduce each subscription ratio separately to avoid multicollinearity.

Table 4 shows our model related to profitability such that:

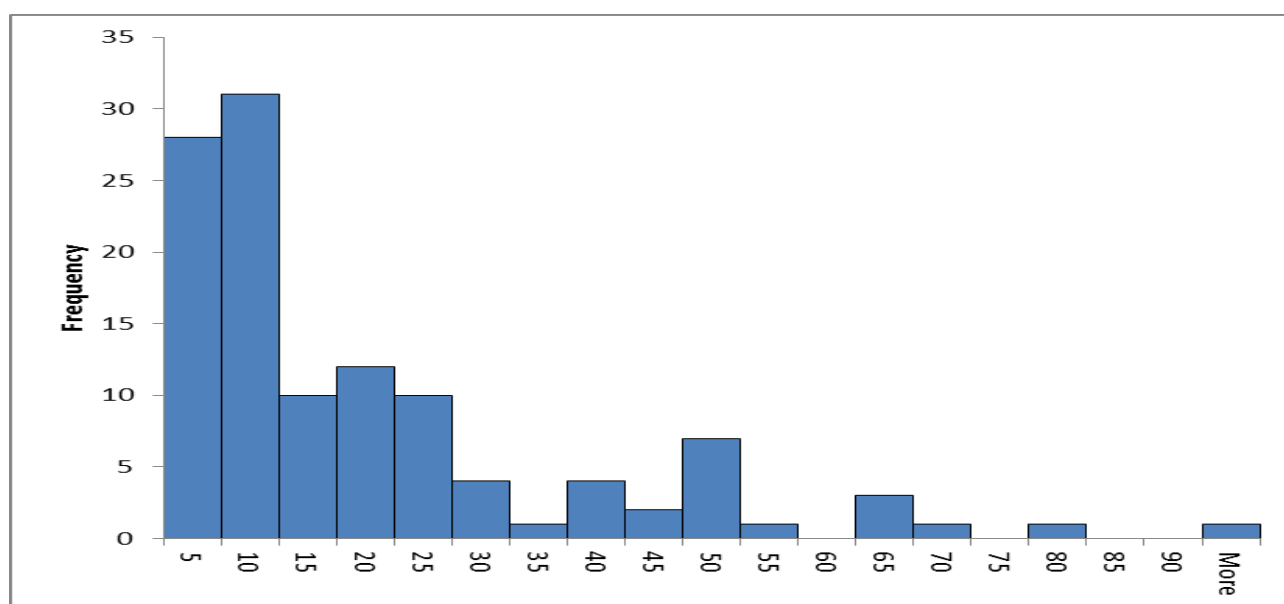
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Offer Price Range = f (Investor demand proxied with QII, NII, RII, Return on Shareholders funds (RSH) and Return on Shareholders funds in the previous year (RSH-1). Models (1), (2), (3) introduce each subscription ratio separately to avoid multicollinearity.

Table 5 shows our complete model such that:

Offer Price Range = f (Investor demand proxied with QII, NII, RII, RSH, RSH-1, Earnings per share (EPS) and Earnings per share in previous year (EPS-1). Total proceeds measured in Crore and Current Ratio (CR) were used as control variables. Each subscription ratio (QII, NII, RII) was regressed separately to avoid multicollinearity.

**Figure 1: Range of Book Builds in IPOs**



Correlations between variables showed some high collinearity between some regressors although when running our models we separated each collinear regressor and ran separate regressions to avoid multicollinearity problems. VIF's and Collinearity diagnostics showed that multicollinearity was not a significant problem for the final estimated models<sup>vii</sup>. Testing of residuals in final models showed that normality assumptions were not violated<sup>viii</sup>.

A summary of the correlations between regressors and the dependant variables of the models are shown in table 2.

Correlations were positive between offer price range (Range) and all demand ratios (QII ratio, RII ratio and NII ratio), earnings per share (EPS), earnings per share in previous year (EPS-1) and total proceeds measured in CRORE. Return on shareholders funds in current and previous year (RSH and RSH-1 respectively) both reported negative correlations signifying that current and prior year profitability have a negative effect on offer price range (although RSH-1 correlation was weak and insignificant). The relationship between current ratio (CR) and offer price range (Range) was also negative although this relationship was again weak and insignificant. We also report strong correlations between NII, QII and RII ratios indicating that retail, high net worth and institutional investor demand are all highly correlated. Other strong correlations that we

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find which were significant are those between RSH and Total proceeds measured in Crore, and between EPS and EPS-1.

**Table 2: Correlations<sup>ix</sup>**

	Range	QII	NII	RII	Crore	RSH	RSH-1	EPS	EPS-1
<b>QII ratio (QII)</b>	0.292 (0.042)								
<b>NII ratio (NII)</b>	0.267 (0.063)	0.799 (0.000)							
<b>Retail ratio (RII)</b>	0.074 (0.614)	0.462 (0.001)	0.799 (0.000)						
<b>Total proceeds (Crore)</b>	0.457 (0.001)	0.170 (0.242)	-0.064 (0.661)	-0.289 (0.044)					
<b>Return on Shareholders funds (RSH)</b>	-0.726 (0.000)	-0.120 (0.488)	0.007 (0.967)	0.038 (0.825)	-0.696 (0.000)				
<b>Return on Shareholders funds previous year (RSH-1)</b>	-0.015 (0.923)	0.252 (0.087)	0.230 (0.120)	0.253 (0.086)	-0.095 (0.525)	0.264 (0.131)			
<b>Earnings per Share (EPS)</b>	0.336 (0.034)	0.245 (0.128)	0.195 (0.228)	-0.097 (0.554)	0.130 (0.425)	0.524 (0.004)	0.192 (0.247)		
<b>Earnings per Share previous year (EPS-1)</b>	0.240 (0.201)	0.467 (0.009)	0.466 (0.010)	0.278 (0.138)	0.091 (0.631)	-0.004 (0.986)	0.165 (0.384)	0.902 (0.000)	
<b>Current Ratio (CR)</b>	-0.215 (0.201)	-0.224 (0.182)	-0.196 (0.246)	-0.063 (0.710)	-0.266 (0.111)	0.044 (0.797)	-0.021 (0.904)	-0.201 (0.297)	-0.386 (0.103)

### 4. The Findings

In Table 3, we use offer price range as our dependent variable and variables that capture investor demand (QII, NII and RII) as independent variables with total proceeds measured in Crore and Current ratio as control variables. We find that investor demand as proxied by NII ratio / Retail ratio / QII ratio have a positive and statistically significant impact on offer range. This result indicates that when investor sentiment is high investment bankers set a high offer price range to allow them to set a higher offer price. Also, a higher offer price range precludes under subscription due to sudden decline of investor sentiment.

Thus, we find strong empirical support for hypothesis H1.

Of the control variables, only total proceeds (measured in Crore) has a positive and significant effect on offer price range. This result suggests that established firms have a higher offer price range enabling them to price the issue at a higher level depending on investor demand. Overall, our models explain the variation in offer range reasonably well with adjusted R<sup>2</sup> ranging from 40% to 46%.

In Table 4, we use offer price range as our dependent variable and variables that capture investor demand (QII, NII and RII) and profitability variables Return on Shareholder funds in current and previous year (RSH and RSH-1 respectively) as independent variables. The Return on Shareholders funds in current year (RSH) was shown to be negative and highly statistically significant in all models. Thus, we find strong empirical support for hypothesis H2.



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Two of the investor demand variables have a weak positive impact on offer price range. This finding implies that the overall impact of investor demand has been weakened when profitability variables are used in the same regression.

Overall, our models explain the variation in offer range well with adjusted  $R^2$  ranging from 50% to 59%.

In Table 5 we use offer price range as our dependent variable and variables that capture investor demand (QII, RII and NII) and profitability (RSH, RSH-1, EPS and EPS-1) as independent variables with Total proceeds measured in Crore and Current ratio (CR) as our control variables. Where individual regressors were collinear we ran separate models to avoid multicollinearity problems.

We find that investor demand variables are no longer statistically significant. Similar to table 4, we find that the effects of investor sentiment (RII, QII and NII) have been diminished. Return on Shareholders Funds (RSH) and Return on Shareholders Funds in previous year (RSH-1) both have a significant negative impact on offer price range in all models. When we include total proceeds measured in Crore as a control variable we find that Current Ratio (CR) has a weak negative impact on offer price range in models (4), (5) and (6). Examining adjusted  $R^2$ , overall our models explain the variation in offer price ranging from 17% to 60%. We find that hypothesis H2 is valid but H1 is no longer supported.

**Table 3: Determinants of offer range for bookbuilding: Investor Demand<sup>x</sup>**

Variables	[1]	[2]	[3]
<b>Intercept</b>	-3.854 (-0.65)	-6.439 (-0.86)	0.003 (0.00)
<b>NII ratio</b>	0.329 (2.26)**		
<b>Retail ratio</b>		1.869 (2.65)**	
<b>QII ratio</b>			0.600 (1.74)*
<b>Total proceeds (Crore)</b>	0.052 (2.30)**	0.056 (2.43)**	0.044 (1.83)*
<b>Current ratio</b>	0.154 (0.56)	-0.034 (-0.10)	0.011 (0.04)
<b>F value</b>	11.40	8.95	9.24
<b>Adjusted R2</b>	0.464	0.398	0.407

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**Table 4: Determinants of offer price range: Profitability**

Variables	[1]	[2]	[3]
<b>Intercept</b>	13.403 (3.17) <sup>***</sup>	15.136 (3.12) <sup>***</sup>	13.005 (3.25) <sup>***</sup>
<b>NII ratio</b>	0.255 (1.73) <sup>*</sup>		
<b>RII ratio</b>		0.482 (0.60)	
<b>QII ratio</b>			0.569 (1.79) <sup>*</sup>
<b>Return on shareholders funds current year</b>	-0.350 (-8.84) <sup>***</sup>	-0.354 (-8.93) <sup>***</sup>	-0.334 (-8.48) <sup>***</sup>
<b>Return on shareholders funds previous year</b>	0.026 (0.19)	0.071 (0.49)	0.043 (0.36)
<b>F value</b>	16.87	11.94	16.57
<b>Adjusted R2</b>	0.591	0.499	0.586

**Table 5: Determinants of Offer Price Range: Full model**

Variables	[1]	[2]	[3]	(4)	(5)	(6)
<b>Intercept</b>	23.058 (2.53) <sup>**</sup>	25.577 (2.73) <sup>**</sup>	22.001 (2.54) <sup>**</sup>	20.100 (3.49) <sup>***</sup>	20.138 (2.62) <sup>**</sup>	23.172 (2.95) <sup>***</sup>
<b>NII ratio</b>	0.218 (0.99)			0.241 (1.16)		
<b>RII ratio</b>		0.047 (0.04)			1.102 (1.12)	
<b>QII ratio</b>			0.534 (1.01)			0.369 (0.85)
<b>Return on shareholders funds</b>	-0.347 (-11.14) <sup>***</sup>	-0.339 (-10.58) <sup>***</sup>	-0.330 (-9.50) <sup>***</sup>			
<b>Return on shareholders funds previous year</b>				-0.421 (-2.43) <sup>**</sup>	-0.465 (-1.91) <sup>*</sup>	-0.419 (-2.01) <sup>*</sup>
<b>Earnings per share current year</b>				16.280 (1.06)	21.521 (1.16)	17.378 (1.09)
<b>Earnings per share previous year</b>	0.468 (0.04)	11.023 (1.09)	0.316 (0.03)			
<b>Total proceeds (Crore)</b>				-0.005 (-0.53)	-0.005 (-0.44)	-0.013 (-0.86)
<b>Current ratio</b>	-1.275 (-1.23)	-1.324 (-1.26)	-1.109 (-1.18)	-0.444 (-2.06) <sup>*</sup>	-0.621 (-1.74) <sup>*</sup>	-0.535 (-2.01) <sup>*</sup>
<b>F value</b>	7.66	6.23	7.57	2.83	1.86	2.07
<b>Adjusted R2</b>	0.600	0.537	0.593	0.260	0.142	0.171

### 5. Summary and Conclusions

Overall, our study supports the following hypotheses. Firstly, offer price range is positively related to investor sentiment as measured by subscription ratios of retail, non-institutional and institutional investors. Secondly, offer price range is negatively related to the profitability of the issuing firm. These results indicate that issuers protect themselves from under subscription by increasing the offer price range of an IPO when investor demand is high. Further, they set a narrow offer price range when the issuing firm is highly profitable to reflect the lower risk of under subscription. We also observe that when we test the impact of investor demand and profitability simultaneously, the profitability variable dominates the investor demand variable. This finding suggests that issuers take profitability much more seriously when setting the offer price range as compared to sentiment driven demand factors.

Our study presents an overview of the determinants of offer price range as they relate to the Indian stock exchange market for the period 2007 to 2012. Due to data matching restrictions of IPO data to financial data for this period, our sample size was reduced from the original 268 IPOs to a final sample size of 49 which the authors acknowledge as a limitation of this study. Further, since our study was limited to the Indian stock market, generalisations cannot be made to other countries or stock exchanges. As such, comparable studies in other markets and countries in which bookbuilding is used to help determine offer price range would significantly expand understanding of the determinants of offer price range and we leave this as a fruitful area for future research.

### Endnotes

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<sup>i</sup> We use the terms offer price band and offer price range interchangeably in this paper.

<sup>ii</sup> The offer range is defined as (H-L) where H and L are the highest and lowest anticipated values of offer price as quoted in the preliminary prospectus.

<sup>iii</sup> The dollar midpoint (M) of the offer range is defined as (H-L) / 2 and represents the expected offer price.

<sup>iv</sup> T statistics are for two tailed tests of means assuming equal variances. \*, \*\*, \*\*\* represent 10%, 5% and 1% significance respectively Only percentage width of offer range was significantly different between DOWN and UP sub samples at 10% significance (p value 0.0801 for two tailed test).

<sup>v</sup> Tests for differences on variables including dollar width of offer range, dollar midpoint of offer range, total proceeds, actual offer price, showed no significant differences in means at 5% level of significance.

<sup>vi</sup> A crore is a unit in the South Asian numbering system equal to ten million (10,000,000; Scientific notation) and is widely used in India.

<sup>vii</sup> Centred VIF statistics ranged from 1.00 to 4.12. Standard errors, t and F statistics indicated no significant problems of multicollinearity in line with O'Brien, RM, 2007, 'A caution regarding rules of thumb for variance inflation factors' *Quality & Quantity*, Vol 41 Issue 5, pp. 673-690.

<sup>viii</sup> Jacque-Bera tests under the null hypothesis of normally distributed errors resulted in probabilities ranging from 0.1332 to 0.6147

<sup>ix</sup> (p-values in parentheses) \*, \*\*, \*\*\* denote significance at 10%, 5%, 1% respectively.

<sup>x</sup> In parentheses are the t statistics using White heteroskedasticity-consistent standard errors. The dependent variable is offer range for bookbuilding which is defined as (H-L) where H and L are the highest and lowest anticipated values of offer price as quoted in the preliminary prospectus. \*, \*\*, \*\*\* denote significance at 10%, 5%, 1% respectively.

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