Do Individual Investors Prefer a Price Range in the Equity Markets?

Harsimran Sandhu, Kousik Guhathakurta, and Pradip Banerjee

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Harsimran Sandhu
is a doctoral scholar in the Department of Finance and Accounting at Indian Institute of Management (IIM) in Indore, India.
fi14harsimrans@iimidr.ac.in

Kousik Guhathakurta
is an associate professor in the Department of Finance and Accounting at Indian Institute of Management (IIM) in Indore, India.
kousikg@iimidr.ac.in

Pradip Banerjee
is an associate professor in the Department of Finance and Accounting at Indian Institute of Management (IIM) in Indore, India.
pbanerjee@iimidr.ac.in

KEY FINDINGS

- The lowest bands of post split price (PSP) have maximum positive impact on ownership of individual shareholders.
- The shift in ownership from institutional investors to individual investors happens at the lowest bands of post split price (PSP).
- Companies having lower price-to-book ratios and higher market capitalization target lower market prices (PSP) to attract individual shareholders post split.

ABSTRACT

This article focuses on a wealth-constrained individual investor preference for lower price ranges in the Indian secondary equity market, using stock-split data to gauge the effects of lower price ranges on individual ownership. The hypothesis is that individual investors operate within a price range of choice. The overall findings address three specific contributions. First, the impact of various post-split price (PSP) bands on both individual and institutional investors is assessed. Second, a specific PSP range is estimated that triggers a shift in ownership from institutional investors to individual investors. Third, the article shows the firm-specific characteristics for companies that target lower-priced stocks.

TOPICS

Security analysis and valuation, fundamental equity analysis, emerging markets*

The market price of a share partly depends on the nominal share price chosen by a firm at the time of the initial public offering (IPO) and on splits thereafter; however, this dependence may be irrelevant in an efficient equity market. Firms can alter the market price of their stocks by splitting the nominal price[1] in the secondary equity market. Indeed, past empirical evidence—such as work by Lamoureux and Poon (1987); Mukherji, Kim, and Walker (1997); and Weld et al. (2009)—shows that companies undertake a stock split to make their stocks more affordable to individual investors. Individual investors also respond to these lower price ranges (post-split), gravitating toward the stock. The market price of a share is the first thing that individual investors check before making an investment decision based on cost of information

*All articles are now categorized by topics and subtopics. **View at PM-Research.com**.

[1] In India, companies are free to choose the nominal price as long as it is not fractional.

EXHIBIT 1

Post-Split Price Bands (2006–2015)

Post-Split Price Ranges (INR)	Total Number of Companies Issuing Splits
0–50	240
50–100	104
100–150	54
150–200	37
200 plus	80

SOURCE: National Stock Exchange (NSE), Mumbai.

and bounded rationality[2] (Simon 1957). Individual investors might overemphasize the importance of the market price in their buy or sell decision-making process, possibly because of availability heuristics[3] (Tversky and Kahneman 1973).

In fact, individual investors might prefer a psychological price range. Indian companies respond to this psychological trait of individual investors by regularly splitting stocks to bring the market price within a desired range that caters to the psychological preferences of individual investors, a phenomenon supported by earlier studies (e.g., McNichols and Dravid 1990; Baker and Gallagher 1980; Brennan and Hughes 1991; and Conroy and Harris 1999).

Weld et al. (2009) describe the nominal price as a puzzle; they argue that companies maintain the nominal price within a specific range over the years in both the primary and secondary equity markets. In a preliminary inquiry into the period between 2006 and 2015, a study of Indian companies finds that approximately 50% of firms tend to target a post-split nominal price of less than Indian National Rupee (INR) 50 (Exhibit 1).

Stock splits are likely to result in a shift in clientele, moving from institutional to individual investors (Lamoureux and Poon 1987). Individual investors are attracted to stocks with a lower market price because they tend to consider these stocks as less expensive and as opportunities for more growth compared to shares with a higher market price, thus creating a nominal illusion (Birru and Wang 2016). This nominal illusion among investors can be linked to the additional aspects of framing biases[4] (Thaler 1985) and reference points[5] (Kahneman and Tversky 1979, 1984). High-priced stocks are set as the reference for low-priced stocks (Alforda and Biswas 2002), thus creating an illusion that low nominal-priced stocks are available at a bargain post-split. Because individuals are more averse to losses, they might believe that lower stock prices entail lower downside risks than high-priced stocks, which forms a lower reference price in their minds. Lower-priced stocks display characteristics similar to the features of a lottery (a chance to "make it big" on the right move), and individual investors are inclined to gamble with such lower-priced stocks. This argument is supported by Kumar (2009), who states that individual investors in similar socioeconomic groups that have a higher likelihood to invest in lotteries are likely to gravitate toward low-priced shares.

What kind of companies target lower post-split prices (PSPs) in the secondary market? Motivated by the split-price data of Indian companies (Exhibit 1), we divide the companies into two categories: companies that target a PSP of less than INR 100 and companies that seek a PSP of more than INR 100. We then estimate the firm-level characteristics, such as the price-to-book ratio, market capitalization, and percentage of individual holdings before splitting the market price (Exhibit 2).

Exhibit 2 shows that companies with a lower market capitalization (pre-split) and lower price-to-book ratios (pre-split) seem to target lower PSPs. Companies that pursue a lower PSP range (less than INR 100) lean toward a higher percentage

[2] Bounded rationality is limited by the cognitive limitations of the mind and the time available to make the decision.

[3] Available heuristics show that individuals overemphasize information that can be easily retrieved from memory when they make any decisions.

[4] Framing biases are a behavioral interpretation of the market price where individual investors frame their decisions based on the absolute market prices rather the percentage of returns.

[5] The term reference point is first coined by Kahneman and Tversky (1979) in their famous paper about the prospect theory. Individual investors might have a reference point in mind regarding the market prices for gains and losses while trading in the secondary market.

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EXHIBIT 2

PSP and Firm-Level Characteristics (pre-split)

Firm-Level Characteristics	PSP Band (INR), 2006–2015	
	Less than INR 100	Greater than INR 100
Mean PSP (INR)	36.58	304.64
Mean Price-to-book Ratio Before Split (INR)	5.66	8.67
Mean Market Capitalization Before Split (INR Mn)	5624.62	115593.2
Mean Individual Percentage Holding Before Split (%)	33.65	17.25

of individual investors in their ownership structure before the split. These observations are supported by Kumar and Lee (2006), who point out that retail investors concentrate their holdings and trading activities in smaller-sized companies, lower-priced stocks, and firms with lower institutional ownership.

Another important question in financial economics focuses on whether the absolute market price levels influence a company's underlying ownership. The literature widely supports the argument of low nominal price aversion among institutional investors (Conroy, Harris, and Benet 1990; McInish and Wood 1992) and preference for a lower share price among individual investors (Dhar, Goetzmann, and Zhu 2003). Companies are likely to split market prices around an optimal price range (post-split), prompting a shift in ownership from institutional to individual investors. However, fundamental questions remain regarding whether the shift is higher for lower PSP bands compared to relatively higher PSP bands and whether individual investors exhibit any preferred range.

Stock splits provide a natural experiment for identifying the impact of various PSP bands on individual investors; by analyzing this phenomenon, our study makes three specific contributions. First, we can estimate the effect of various PSP bands (low to high) on both individual and institutional investors. Second, we can analyze a specific PSP range that triggers a shift in ownership from institutional investors to individual investors. Third, we can examine the impact of various firm-specific characteristics on post-split individual ownership dispersion. Overall, the results will have important consequences for agency issues and corporate control because ownership dispersion ensues after the price splitting.

The current article is organized as follows. First, we briefly review the literature and data on the effects of PSPs on individual holdings. Second, we describe the sample data and variables. Third, we elaborate on the research methodology and specify the model. Fourth, we present the regression results and our discussion. Fifth, we estimate the effects of various post-split ranges on institutional shareholders. Sixth, we offer conclusions of the study.

POST-SPLIT PRICE IMPACT ON INDIVIDUAL INVESTOR HOLDINGS

In this section, we briefly review the literature and some data points to demonstrate the impact of stock splits on individual investors.

Related Literature

The literature focuses on the impacts of lower nominal prices (after stock splits) on institutional and individual investors (e.g., Lamoureux and Poon 1987; Mukherji, Kim, and Walker 1997). Indeed, the findings of previous studies show that the shareholdings of small investors (individual holdings) increase after stock splits (Schultz 2000). The post-split increase among individual shareholders is a result of increased

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EXHIBIT 3

Nominal Prices and Percentage of Individual Holdings (2006–2015)

PSP Ranges (INR)	Mean Percentage of Individual Holdings against Each PSP Band (%)
0–10	40.48
11–20	39.5
21–30	28.98
31–40	22.8
41–50	23.09
51–100	20.09
101–150	19.36
151–200	13.08
Greater than 200	10.66

NOTES: Individual investors hold a higher percentage of ownership in lower PSP stocks. There is a consistent drop in the percentage of individual ownership as the PSP increases.

SOURCE: CMIE Prowess Database.

attention or investor recognition (Merton 1987). Investors categorize stocks based on the market price; therefore, a lower market price can attract increased attention. Individual investors limit their searches to stocks that catch their interest. Amihud, Mendelson, and Uno (1999) employ a unique feature of the Japanese equity market to estimate the impact of a reduction in trading units (or lot size) on individual shareholders, and they conclude that a reduction in minimum trading units of a stock positively impacts the number of individual shareholders, liquidity of the stock, and stock price. Dhar, Goetzmann, and Zhu (2003) provide further evidence regarding the trading of individual investors increasing around stock splits, finding that splits of nominal prices are associated with a shift toward less sophisticated individual investors, who display increased interest in reduced PSP ranges in the secondary equity market. This decrease in equity prices induces a shift in ownership from institutional investors to individual investors. Kumar and Lee (2006) conclude that this shift might occur because retail investors gravitate toward lower-priced stocks. Another related argument by Amini and Cai (2015) explains how companies target optimal price ranges to influence noise trading (noise trading is the abnormal trading in shares when it reaches a specified market price) at different levels of nominal prices. Compared to high nominal prices, lower nominal prices produce higher noise trading. In a related study, Lin, Singh, and Yu (2009) contend that companies and managers use stock splits to expand uninformed trading so that equity markets can provide liquidity to the stock at a lower cost. We extend the existing literature by estimating a specific post-split range that exerts the maximum positive impact on individual ownership after a split in the secondary equity market.

Data

We combine the evidence drawn from our literature review and the split-price data points derived from the Indian equity market (Exhibit 1) to demonstrate that most Indian companies split nominal prices to reduce the stock price, lowering it into a specific range. Following data points further shows that a higher level of individual ownership prevails at the lower price bands (Exhibit 3) and also changes in individual ownership are highest at the lower bands of PSPs (Exhibit 4).

SAMPLE DATA AND DESCRIPTION

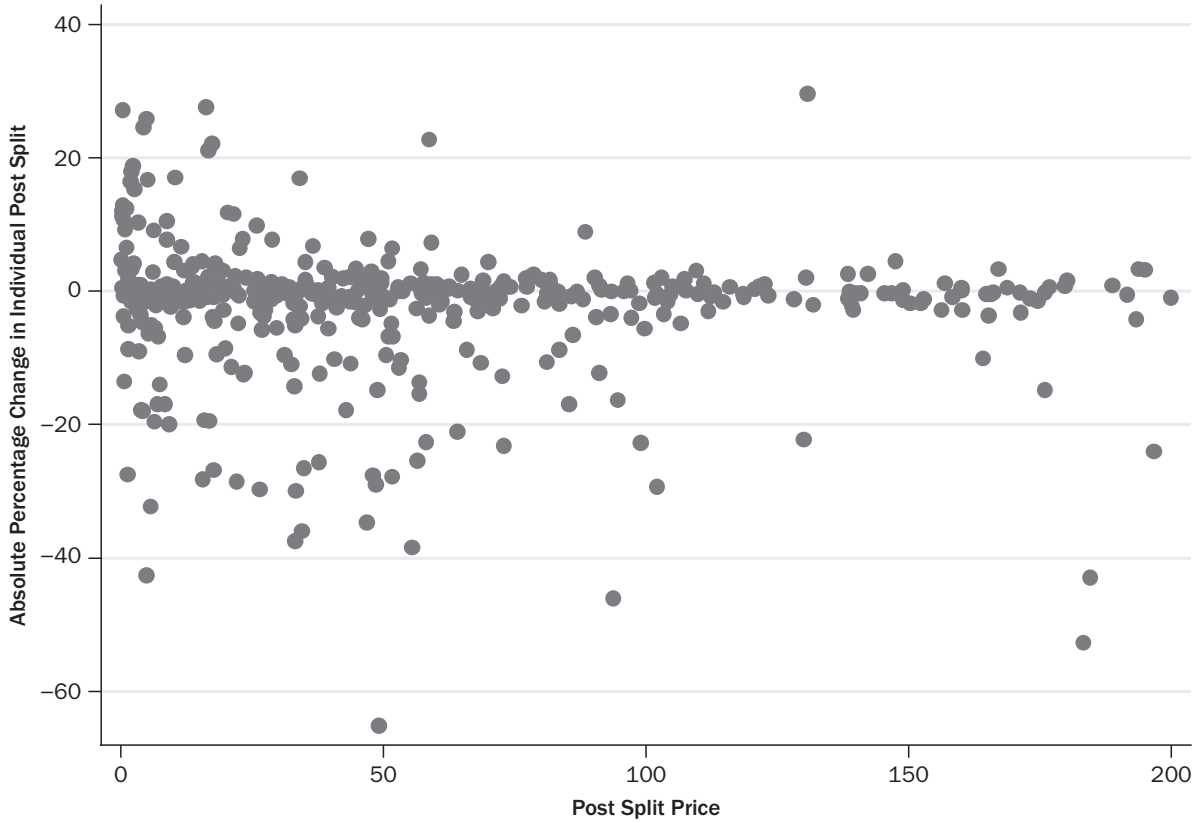
Sample Data

Our current study uses cross-sectional data of Indian companies that split their market prices between 2006 and 2015. Refer to Exhibit 5 for descriptive statistics for sample variables. We gather the split-price data of Indian companies from the NSE[6]

[6]NSE is the leading stock exchange of India and is located in Mumbai. NSE was established in 1992 as the first demutualized electronic exchange in the country. NSE has a market cap of US$2.27 trillion (April 2018) with more than 1,952 listings.

EXHIBIT 4

Scatter Plot of Change in Individual Holdings Post-Split against Various Post-Split Ranges (2006–2015)



NOTES: The maximum dispersion of individual investors post-split happens at a PSP of less than INR 50. The dispersion decreases at higher PSPs. In India, companies' annual reports capture individual holdings every quarter.

SOURCE: CMIE Prowess Database.

database, which captures historical daily price quotes. We consider the PSP one day after the split. A total of 496 companies undertake splits between 2006 and 2015.

The quarterly reports of all listed Indian companies must specify their underlying ownership in terms of both the absolute number and the percentage. However, the percentages of individual shareholdings are only available from 2006 to 2015 (CMIE Prowess Database). Because the underlying shareholding percentage is available at the end of every quarter, the estimation window is divided between two monthly quarters. To exclude the split announcement, the individual shareholding percentage estimation is performed two quarters before the split's monthly quarter ($q - 2$). We assume that the full effect of the splitting of nominal prices comes into effect one quarter after the split quarter.

The percentile distribution of the pre- and post-split prices (Exhibit 6) shows that Indian companies split the nominal prices within a certain range. The 50th percentile for the PSPs is approximately INR 55, which is more than one-fifth of the PSP (at the same percentile). The mean promoter holding for the percentage of split stocks for the sample is 45%. The price-to-book ratio is just under three times for half of the companies (at the 50th percentile), which supports the notion of the catering theory of nominal prices, indicating that companies with low price-to-book ratios split to attract more low-price premiums (Baker, Greenwood, and Wurgler 2009) for their shares post-split. The 90th percentile of the PSP is approximately INR 289. A study

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EXHIBIT 5

Descriptive Statistics for Sample Variables

Sample Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Individual Ownership Changes post-split ($\Delta INDSH_s$)	496	–2.28619	10.08641	–65.18	29.63
Market Capitalization (INR Mn)	496	40082.51	196118	0.96	2766418
Price-to-book Value Ratio	496	6.385423	11.19	0.04	114.77
Promoter Holding (%)	496	45.49	23.30558	0	90.4
PSP (INR)	496	104.80	135.0539	0.15	1131.55

EXHIBIT 6

Percentile Distribution of the Sample Variables

	Percentiles				
Sample Variables	10%	25%	50%	75%	90%
Pre-split Price (INR)	33.3	115	321.75	691.55	1198.35
PSP (INR)	5.8	19.45	55.4	138.55	289.55
Price-to-book	0.78	1.37	2.9	6.43	14.86
Promoter Holding (%)	8.56	28.85	49.62	64.3	73.52
Market Capitalization (INR Mn)	199.8	656.19	2430.75	11519.6	38170.1

of a sample of Indian companies (2006–2015) suggests that approximately half of them tend to target a nominal PSP of less than INR 50 (Exhibit 1).

Sample Variable Description Δindividuals – $\Delta INDSH_s$

Individual shareholding percentages are available at the end of every quarter. The number of small shareholders increases following a share split (Schultz 2000; Amihud, Mendelson, and Uno 1999). To capture this increase in individual shareholders post-split, we estimate Δ*Individuals*, which calculates the absolute difference between the percentage of individual shareholdings one quarter after the split quarter (percentage of individual holdings after the split quarter) and the percentage of individual shareholding two quarters before the split quarter (percentage of individual holdings before the split quarter). To exclude the bias that might arise from the split announcement on individual holdings, we estimate the percentage of individual holdings two quarters before the split. To fully incorporate the effect of the split on individual holdings, the percentage of individual ownership is estimated one quarter after the split quarter.

PSP Bands

The PSP is assessed immediately after splitting the market price. PSP bands are represented by dummy variables that become the independent variables in the regression model. The PSP data are divided into eight PSP bands (In INR): 0–10, 11–20, 21–30, 31–40, 41–50, 51–100, 101–150, and 151–200. Several previous studies—Conroy and Harris (1999); Lamoureux and Poon (1987); Mukherji, Kim, and Walker (1997); and Schultz (2000)—find that individuals are more wealth constrained and cannot afford stocks with a higher nominal price; consequently, firms actively split stocks to make them more affordable to individual investors. We expect that a lower PSP band will have a positive and significant impact on individual shareholdings after the split.

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EXHIBIT 7

Correlation Matrix among the Sampled Variables

Sample Variables	PSP	MC	PH	P/B Ratio	$\Delta INDSH_s$
PSP	1				
MC	0.27	1			
PH	0.15	0.0828	1		
P/B Ratio	0.16	0.15	–0.0778	1	
$\Delta INDSH_s$	0.022	0.0638	0.19	–0.250	1

NOTES: PSP = post-split price; MC = market capitalization; PH = promoter holding; P/B Ratio = price-to-book ratio; $\Delta INDSH_s$ = Change in individual post-split.

SOURCE: NSE Infobase Prime database.

Size and Value

The regression model captures the firm-specific characteristics of size and value, which are represented by the market capitalization (*Log MC*) and the price-to-book value ratio (*P/B ratio*), respectively. Both the market capitalization and price-to-book ratio are assessed before the split's monthly quarter. Companies are inclined to secure a low-price premium by splitting the nominal price (Baker, Greenwood, and Wurgler 2009). Here, low-price premiums are associated with companies with lower nominal prices in the equity market. Brennan and Copeland (1988) present a research model in which undervalued firms employ stock splits to signal the quality and strength of their future prospects. We anticipate a negative relationship between the post-split individual changes ($\Delta INDSH_s$) and price-to-book values. Regarding market capitalization, Stoll and Whaley (1983) note a positive association between the market value of equity and the price per share for common stocks. Higher capitalization stocks tend to split nominal prices to lower prices to portray themselves as small-cap companies and attract individual shareholders (Dyl and Elliott 2006; Weld et al. 2009). Thus, we expect a positive relationship between post-split individual holding changes ($\Delta INDSH_s$) and market capitalization (pre-split).

Percentage of Promoter Ownership before Split

Indian companies are more likely to display high promoter holdings.[7] Black (1992) describes a political model of corporate governance related to the passivity model, with each shareholder owning a small fraction of the company's equity stock, creating collective action problems for shareholders. On the other hand, shareholders who hold more shares in the company (such as institutional investors) demand rigorous monitoring of the company. Therefore, promotors with a higher percentage share in companies would prefer higher passivity among shareholders (through stock splits) because they do not want to relinquish existing control. This result suggests that promoter holdings (pre-split) and $\Delta INDSH_s$ should have a positive relationship.

The correlation matrix (Exhibit 7) shows a low positive relationship between post-split individual holding changes ($\Delta Individuals$) and the PSP (0.022). We expect a higher positive $\Delta Individuals$ value at lower PSP levels. The correlation between the PSP bands and market capitalization is positive (0.27). As suggested by Dyl and Elliott (2006), higher (lower) capitalization companies target higher (lower) PSPs. The correlation between post-split individual holding changes after the split ($\Delta Individuals$) and the price-to-book ratio (pre-split) displays a negative relationship (–0.25). This observation is supported by our previous finding based on the data (Exhibit 2) and by previous studies (e.g., Brennan and Copeland 1988) indicating that companies with low price-to-book ratios pursue lower PSPs to attract low-price premiums (as proposed by Baker, Greenwood, and Wurgler 2009), thus attracting more individual shareholders after the split.

[7] The percentage holding of promoters in Indian companies listed on the NSE stood at 54.46% as of June 30, 2019, and the value of promoter holdings in companies listed on NSE is INR 73.33 lakh crore.

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METHODOLOGY AND MODEL

Stock splits serve as a natural experiment for identifying the impacts of various PSP bands on individual investors. In this section, we propose a model for estimating a post-split range that produces the highest positive impact on the ownership of individual investors. The research model uses a cross-sectional sample of companies that split their nominal prices between 2006 and 2015 (inclusive). The percentage of ownership of individual holders is available quarterly. The percentage of individual ownership is assessed two monthly quarters before the split's monthly quarter, $INDSH_{(q-2)}$, and one monthly quarter after the split quarter, $INDSH_{(q+1)}$. Then, $\Delta INDSH_s$ is estimated as follows

$$\Delta \text{INDSH}_s = \text{INDSH}_{(q+1)} - \text{INDSH}_{(q-2)}$$

where q = *split monthly* quarter

To understand the impacts of the various PSPs on individual shareholdings ($\Delta INDSH_s$), we employ a multiple regression (robust standard error) model. We divide the PSPs into eight price bands to analyze the impact of lower PSPs to higher PSPs on individual shareholdings. We expect a higher individual shareholder preference for lower PSP bands compared to higher bands. PSP bands less than or equal to INR 50 are kept at an interval of 10. For PSPs higher than INR 50, the interval is maintained at 50. For the various PSP bands, we introduce binary dummy variables (1, 0) to represent the PSP (low to high) ranges, which become the independent variables in the linear regression model. Each PSP band is regressed against the absolute percentage change in individual holdings after the split, $\Delta INDSH_s$.

The split samples are divided into eight PSP bands (In INR): 0–10, 11–20, 21–30, 31–40, 41–50, 51–100, 101–150, and 151–200. Each PSP band takes a value of 1 if the PSP falls within the PSP range; each band is valued at 0 otherwise. The random assignment of binary dummies solves the problem of selection bias for the PSPs, enabling them to become independent of the potential outcomes.

$\Delta INDSH_s$ expresses the absolute percentage difference (+/–) in individual shareholdings one month after the split's monthly quarter, $INDSH_{(q+1)}$, and two monthly quarters before the split monthly quarter, $INDSH_{(q-2)}$. We run a linear multiple regression (robust standard errors) model (refer to the regression equation model) in which $\Delta INDSH_s$ becomes the dependent variable, and the PSP band dummies become the independent variables. The other independent variables (firm-level characteristics) in the regression model are market capitalization (representing size), price-to-book ratio (representing value), and percentage of promoter holdings (pre-split). All the firm-level characteristics are estimated before the nominal price split.

Regression Equation Model

$$\Delta INDSH_s = \beta_0 + \sum_{i=1}^{8} \beta_i D_i(\textit{post price split ranges}) + \sum_{j=1}^{3} \gamma_j X_j + u$$

The change in individual shareholding (post-split) is represented by $\Delta INDSH_s$:

- β_1 *to* β_8: Regression coefficients for the PSP ranges
- γ_1 *to* γ_3: Regression coefficients for the firm-specific variables, with the regression coefficient estimating the impact of firm-specific variables on individual holdings post-split (that is, market capitalization, price-to-book value, and promoter holdings)

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EXHIBIT 8

Regression Results (using robust standard errors)

Independent Variables	Dependent Variable: $\Delta INDSH_s$ N = 496 (regression coefficient)
β_1 Dummy_ (0–10)	4.97*
	(0.015)
β_2 Dummy_ (11–20)	4.32*
	(0.015)
β_3 Dummy_ (21–30)	1.71
	(0.357)
β_4 Dummy_ (31–40)	–0.95
	(0.610)
β_5 Dummy_ (41–50)	–1.95
	(0.404)
β_6 Dummy_ (51–100)	–0.78
	(0.418)
β_7 Dummy_ (101–150)	1.37
	(0.242)
β_8 Dummy_ (151–200)	–1.97
	(0.383)
γ_1 Log Market Capitalization (Log MC)	1.76*
	(0.001)
γ_2 Price-to-book Ratio	–0.224*
	(0.002)
γ_3 Promoter Holdings Prior to Split	0.082*
	(0.000)
Intercept	–11.59
	(0.000)
Adj R-squared	0.1613
F-value (P-value)	0.0000*

NOTES: *Statistical significance at the 1%, 5%, and 10% levels. P-values are cited in parentheses.

- X_j = Firm-specific variables (i.e., market capitalization (pre-split); price-to-book ratio (pre-split); promoter holding prior to split)

wherein j = 3

$$Di \begin{cases} \text{if within the PSP range} = 1 \\ \text{if outside the PSP range} = 0 \end{cases}$$

Di are the dummy variables; $i = 8$

REGRESSION RESULTS AND DISCUSSION

In this section, we present the multiple regression results (Exhibit 8) and estimate the effects of various PSPs on $\Delta INDSH_s$. We run the linear regression model with robust standard errors to remove any heteroskedasticity issues in the regression results. We correct the standard errors for any heteroskedasticity in the model. We also check the regression model for multicollinearity among the regression variables, and all variance inflation factors (VIFs) are less than 5 (Appendix A).

The change in the fraction of individual ownership post-split (regression coefficient) is at its maximum when the PSP falls within the lowest ranges (i.e., 0–10 and 11–20). The regression coefficients for the PSP ranges of 0–10 and 11–20 are positive and statistically significant (at the 1%, 5%, and 10% significance levels). Individual investors ($\Delta INDSH_s$) react positively to two PSP ranges: INR 0–10, with a coefficient of 4.97 and p-value of 0.015, and INR 11–20, with a coefficient of 4.32 and p-value of 0.015. This PSP range matches the data listed in Exhibit 3, showing that individuals hold the highest ownership among companies in the ranges of 0–11 and 11–20 after a split.

We see a consistent decrease in the regression coefficients for the higher bands of the PSP range. The regression coefficients for the higher PSPs are negative and not statistically significant. Individual shareholders react positively to lower PSP ranges compared with higher PSP ranges.

The firm-specific independent variables—price-to-book ratio, promoter holdings, and pre-split market capitalization—exhibit statistically significant regression coefficients. The price-to-book ratio displays a negative coefficient of –0.224 and p-value of 0.002. The results are consistent with the observations of Baker, Greenwood, and Wurgler (2009), who argue that firms split their share prices to target low-price premiums. Thus, companies with low price-to-book ratios seek to attract individual shareholders after the split who take advantage of the low-price premiums. These results are also consistent with the initial observations (Exhibit 2), which indicate that companies targeting lower PSP ranges display lower price-to-book ratios. Promoter holdings and market capitalization (pre-split) produce positive and significant regression coefficients. The results for pre-split market capitalization are consistent with

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those of Dyl and Elliott (2006) and Weld et al. (2009), who find that high-capitalization companies (associated with a higher market price) tend to split market prices to lower levels to present themselves as being small-cap or mid-cap companies, thus expanding individual ownership post-split. Higher promoter holdings seem to target greater dispersions among individual shareholders to increase passivity among shareholders. The small shareholders and individuals apply a passive approach (because of the collective action problem) as the initial promoter will be more active in monitoring the company (Black 1992). The promotors with a higher ownership percentage (pre-split) will continue to control by dispersing residual ownership (post-split) among individual investors. This dynamic affects agency issues and corporate control because ownership dispersion occurs after price splits.

EFFECT OF POST-SPLIT PRICE RANGES ON INSTITUTIONAL INVESTORS

In this section, we estimate the effects of PSPs on institutional investors. Here, we assume that institutional investors are rational and should be less affected by reductions in market prices in the form of stock splits. Institutional investors understand that companies aim for individual investors when splitting stocks. Indeed, stocks splits result in higher trading costs for institutional investors. In fact, Conroy, Harris, and Benet (1990) and McInish and Wood (1992) document a rise in the bid–ask spread after stock splits, which increases the cost of trading for institutional investors. Falkenstein (1996) and Gompers and Metrick (2001) provide further evidence that institutional investors avoid low-priced stocks.

A portion of institutional ownership will decline after a stock split because an institution will increase its holdings in similar stocks with lower bid–ask spreads within the secondary market. Thus, we argue that an ownership shift from institutional to individual investors happens at lower PSP levels.

Changes in individual and institutional shareholders are positively related to the split factor (Mukherji, Kim, and Walker 1997). Empirical evidence further suggests that a greater number of shareholders will decrease institutional ownership and that the impact of stock splits on firms' ownership structures carries implications for organizational control, monitoring, and agency costs.

Regression Equation: Change in Institutional Investors and PSP Ranges

"The objective of our model is to statically estimate the effects of various PSP ranges on institutional investors after the split—Refer to the regression model below

$$\Delta INSTI_s = \beta_0 + \sum_{i=1}^{8} \beta_i D_i (post\ price\ split\ ranges) + \sum_{j=1}^{3} \gamma_j X_j + u$$

- $\Delta INSTI$: Absolute difference between institutional shareholders ($\Delta INSTI$) holding percentages between one quarter after the split and two quarters before the split.
- β_1 *to* β_8: Regression coefficients of the PSP ranges.
- γ_1 *to* γ_3: Regression coefficients of the firm-specific variables (size, value, promoter holdings).
- PSP ranges (In INR): 0–10, 11–20, 21–30, 31–40, 41–50, 51–100, 101–150, 151–200.

EXHIBIT 9

Regression Results (using robust standard errors)

Independent Variables	Dependent Variable – ΔINSTI N = 520 (regression coefficient)
β_1 Dummy_ (0–10)	–5.38*
	(0.002)
β_2 Dummy_ (11–20)	–2.98*
	(0.014)
β_3 Dummy_ (21–30)	0.629
	(0.666)
β_4 Dummy_ (31–40)	0.456
	(0.666)
β_5 Dummy_ (41–50)	–1.745
	(0.188)
β_6 Dummy_ (51–100)	–0.866
	(0.380)
β_7 Dummy_ (101–150)	0.071
	(0.242)
β_8 Dummy_ (151–200)	2.62*
	(0.067)
γ_1 Log Market Capitalization (Log MC)	–0.5053
	(0.304)
γ_2 Price-to-book Ratio	–0.050
	(0.220)
γ_3 Promoter Holdings Prior to Split	–0.0194
	(0.298)
Intercept	3.25
	(0.222)
Adj R-squared	0.0600
F-value (P-value)	0.0038

NOTES: *Statistical significance at the 1%, 5%, and 10% levels. P-values are in parentheses. The regressions model is checked for multicollinearity issues among the regression variables, and all VIF factors are less than 5 (Appendix B).

- Di: Binary dummy variables, where *i = 8 PSP ranges.*

$$Di \begin{cases} \text{if within the PSP range} = 1 \\ \text{if outside the PSP range} = 0 \end{cases}$$

- $\mathbf{X_j}$*: Firm-specific variables pre-split – j = 3.*
- $\mathbf{X_1}$*: Market capitalization;* $\mathbf{X_j}$ *= Price-to-book ratio;* $\mathbf{X_3}$ *= Promoter holdings pre-split*

The results of the regression analysis (Exhibit 9) show that institutional investors display a negative preference for lower PSP ranges of INR 0–10 and 11–20, while individual investors are attracted to similar PSP ranges (Exhibit 8). The dummies representing the PSP ranges of 0–10 and 11–20 show negative and significant coefficients of –5.84 (0.000) and –3.23 (0.003), respectively. We also check the regression model for multicollinearity among the regression variables, and all variance inflation factors (VIFs) are less than 5 (Appendix B). The empirical evidence supports the earlier conjecture that institutional investors do not prefer lower nominally priced stocks. The results also are in line with previous findings (such as those of Conroy, Harris, and Benet 1990) that institutional investors are averse to low nominal prices because of an increased bid–ask spread. All of the firm-specific variables (i.e., market capitalization, price-to-book ratio, promoter holdings) are not statistically significant.

CONCLUSIONS

Individual shareholders react differently to various PSPs. Compared to other PSP ranges, lowest ranges of PSPs have highest positive impact on individual shareholding post split. These findings are supported by the Kumar (2009) analysis, which notes that investors consider low-priced stocks as having features similar to those of a lottery, and thus the gambling preference of individuals is reflected in their decisions to invest in the equity market. Our current work demonstrates that the PSP ranges of INR 0–10 and 11–20 produce the maximum positive and significant impacts on the ownership of individual holdings. An individual might perceive future gains or losses based on a reference price and might consider a stock to be relatively inexpensive if it falls below a certain reference price (and, conversely, expensive if it exceeds this price). Individual investors may also view low-priced stocks as closer to zero; hence, they assume that these stocks have fewer potential disadvantages and greater potential for benefits. Institutional investors, on the other hand, might prefer to move away from low-priced stocks. In this very interesting phenomenon, the shift in ownership from institutional to individual investors happens at a common PSP range (i.e., INR 0–10 and 11–20). Companies understand very well this behavioral bias of individual investors toward stock splits. Individual investors would benefit from understanding that a preference for a nominal price range in equity markets

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represents a behavioral bias, and companies maintain the price around an optimal range to take advantage of this bias. Companies that want to change their clientele thus can choose a price range preferred by individuals but disliked by institutional investors. These results hold important implications and consequences for agency issues and corporate control because ownership dispersion occurs after the split.

APPENDIX A

VARIANCE INFLATION FACTOR (VIF)

Regression Variables	VIF	1/VIF
Dummy 0_10	2.81	0.356
Dummy 50_100	2.15	0.456
Dummy 11_20	1.9	0.526
Log (market capitalization)	1.8	0.554
Dummy 31_40	1.62	0.616
Dummy 41_50	1.53	0.652
Dummy 21_30	1.51	0.662
Dummy 101_150	1.47	0.678
Dummy 151_200	1.35	0.741
Promotor Holdings	1.16	0.86
Price-to-book Ratio	1.09	0.915
Mean VIF	1.45	

APPENDIX B

VARIANCE INFLATION FACTOR (VIF)

Regression Variables	VIF	1/VIF
Dummy 0_10	2.23	0.448383
Dummy 51_100	1.73	0.577265
Log (market capitalization)	1.62	0.61789
Dummy 11_20	1.57	0.635739
Dummy 31_40	1.4	0.713899
Dummy 21_30	1.34	0.744954
Dummy 100_150	1.34	0.748286
Dummy 41_50	1.33	0.75055
Dummy 151_200	1.23	0.811448
Promotor Holdings	1.12	0.896082
Price-to-book Ratio	1.06	0.940112
Mean VIF	1.45	

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