

# **The Market Reaction to Stock Split Announcements: Earnings Information After All**

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## **Abstract**

We re-examine the original “information hypothesis” which seeks to explain the abnormal returns around stock split announcements. While recent research focuses on liquidity and catering theories, our evidence re-affirms a link between the abnormal returns and earnings growth. Analysts revise earnings forecasts by 2.2-2.5% around split announcements, and this revision is significantly larger than that for matched firms. We further show that the earnings information in a split likely arises from the fact that splitting firms experience less mean reversion in their earnings growth relative to matched firms. Consistent with an earnings information hypothesis, the analyst revision and the abnormal returns are stronger for firms with more opaque information environments. Furthermore, the cross-sectional variation in analyst revisions is related to the variation in abnormal returns. We also find evidence on splitting activity and the market reaction to splits that is inconsistent with liquidity-based theories and mixed with respect to catering.

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# 1 Introduction

Many studies document abnormal returns around stock split announcements. However, given that a stock split is simply a superficial change to a security's price and shares outstanding, the reason why we observe abnormal returns is a puzzle that remains unsolved. Different theories have emerged in the literature to explain the abnormal returns around split announcements. The original theories hypothesized that markets learn information about firms' fundamentals (e.g. dividends or earnings) from stock splits. The alternative theories that followed argue that it is not information, but rather increased liquidity that stocks achieve via splits that cause abnormal returns. A more recent catering theory argues that managers split their stock to cater to investors who assign a premium to low-priced stocks during certain periods.

Why the stock market reacts to split announcements differs from the related question why managers choose to split their stock, although the underlying reasons for both questions may be related. It is possible that managers split their stock for a variety of reasons, but that the abnormal returns are caused by market participants reacting to only a subset of these reasons, or to some other inferred information. In practice, CEOs often quote multiple reasons for splitting. For example, when discussing Compaq's 5-for-2 split in 1997, the firm's Chairman Benjamin M. Rosen stated that the split "reflects our confidence in Compaq's long-term growth... [and] the lower post-split share price will make it easier for individual investors to purchase the stock, thus helping broaden the company's ownership base." In a news comment about this split, William Conroy, an analyst in Houston said, "the split is a good sign as companies don't split unless they are feeling good about themselves."<sup>1</sup>

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<sup>1</sup> Houston Chronicle, July 2, 1997

Although a manager may cite multiple reasons for a stock split, we hypothesize that these reasons are often coupled with the manager's belief that the firm is doing well. For example, if managers employ splits to maintain a desired share price range, then they are more likely to split the firm's stock when they believe the stock price will not otherwise decline to the targeted price range. In this case, managers self-select to split their firm's stock when they are optimistic about the firm's future performance (Ikenberry et al. [1996]). Market participants can then infer positive information from a stock split, even though conveying this information is not the manager's goal or intent.

Accordingly, in this paper we re-examine a variation of the original information hypotheses, which attributes the abnormal returns to the positive news markets learn about firm fundamentals from the manager's actions and views. Namely, the view established in the accounting literature that splits inform the market about the firm's earnings growth (Asquith, Healy and Palepu [1989]). Recent literature in finance has seemingly dismissed the link between the abnormal returns around stock split announcements and earnings growth. Instead, recent papers focus on liquidity- and catering-related theories to explain why managers split their stock and why the stock market reacts to stock split announcements (e.g. Baker et al., [2009]; Benartzi et al., [2009]; Lin et al., [2009]). For example, Benartzi et al. [2009] raise doubt about Asquith et al.'s conclusions and state "Asquith, Healy, and Palepu [1989] find large earning increases and returns prior to a split, but none thereafter. Do splitting firms try to signal that they have already reached their peak and their growth rate should revert back to a lower level? That interpretation seems unlikely". Other papers have also struggled to link the stock split announcement to the firm's future abnormal earnings growth, relative to the firm's past growth, or its industry peers (e.g., Lakonishok and Lev [1987], Huang et al. [2006]).

Given the pattern of strong earnings growth prior to splits, and the modest growth after, an important contention is what positive earnings news market participants assign to a split.<sup>2</sup> Asquith et al. [1989] hypothesize that managers are more likely to split their stock when they are confident that the firm's past earnings growth is not *temporary* in nature, and the post-split earnings are likely to be *more permanent*. This hypothesis implies that the market updates future earnings expectations upwards following the split, even though the actual growth rate after the split could be lower than the industry benchmark, or the same firm's growth prior to the split. This is true as long as the market expected the firm's earnings to have a larger temporary component prior to the split announcement. This hypothesis also explains why there is limited evidence linking stock split announcements to firm's future abnormal earnings growth.

Whether or not stock splits contain news about earnings is an important question to resolve because many studies employ stock splits to study other questions, while making different assumptions about splits' informativeness. For example, Louis and Robinson [2005] show that managers use accruals to signal private information by examining the pricing of discretionary accruals in firms that split their stock; their assumption is that stock splits represent a credible signal of information. In contrast, Baker et al. [2009] argue that stock splits provide a good laboratory for studying managers' behavior because splits "are not associated with any confounding, 'real' motivation involving firm fundamentals".

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<sup>2</sup> Another reason why stock splits have been considered dubious information events, relates to the difficulty in identifying the cost associated with the stock split, which is required for a credible signal. However, if managers follow a rule where they are more likely to split their firm's stock when they are optimistic about the firm's future performance, and not because of a signaling motive, then managers who are not optimistic will have no desire to mimic these splitting firms. They will be more concerned with the long-run stock price performance of the firm, as opposed to the relatively small abnormal returns achieved by announcing a stock split. Therefore, the market can infer information from the manager's actions, even if the manager is not actively signaling his private information.

We seek to bridge the gap in views about the informativeness of stock split announcements by providing a new set of results which shows that market participants react to stock splits in a way that is consistent with learning about the firm's earnings growth. We achieve this goal in several steps. First, similar to many previous papers, we establish that stock split announcements in our sample are associated with abnormal returns, even after controlling for confounding news events in the form of earnings announcements, management guidance, and dividend change announcements. The mean abnormal return for all the firms in our sample over three days around the split announcement is 1.7% [ $t$ -stat 19.50]. When we exclude observations that coincide with confounding announcements, the mean abnormal returns remains positive at 1.6% [ $t$ -stat 12.36]. Second, consistent with an information hypothesis, we find that the abnormal returns are higher for firms for which there is less other publicly available information, as measured by fewer analysts following the firm. We control for the liquidity of the stock in the form of trading volume and bid-ask spreads; thus, the relation between abnormal returns and the number of analysts following the firm does not result solely from a liquidity effect.

As a third step, to show that market participants update their expectations about the firm's future earnings, we examine the change in analyst forecasts around the stock split announcement. The advantage of examining analyst forecasts is that the pre-split analyst consensus provides an estimate of the market's ex-ante expectations, and the change between the pre-split and post-split forecasts thus measures the change in expectations conditional on the split. This change in expectations is difficult to analyze by examining actual reported earnings over longer horizons.

In our full sample, the change in the consensus forecast normalized by the pre-split stock price ( $\Delta EPS/P$ ) is between 0.13% [ $t$ -stat 8.33] and 0.14% [ $t$ -stat 9.76]. The increase remains

positive and significant, between 0.13% [ $t$ -stat 4.22] and 0.15% [ $t$ -stat 5.71], even after we exclude observations that are potentially confounded by coinciding announcements. Based on the median P/E in our sample (17), these results translate to a 2.2% - 2.5% increase in the average earnings forecasts. These revisions are significantly larger than those experienced by firms with similar past returns, as well as firms with a similar propensity to split that did not split in the same year ( $p$ -matched firms). For these matched firms, analysts revise earnings forecasts between 0.03% and 0.05%. Furthermore, we find cross-sectional differences in the magnitude of the analyst forecast revisions. Firms with lower analyst following and lower market capitalization are associated with higher revisions, implying that a split announcement is more informative to analysts for firms with more opaque information environments. Finally, the cross-sectional variation in analyst forecast revisions is positively related to the cross-sectional variation in abnormal returns.

While we are not the first to examine analyst forecast revisions around stock splits, we differentiate ourselves from prior research in several important ways. Conroy and Harris [1999] show that analysts revise their forecasts following a stock split announcement. However, they do not control for any confounding news that is often announced simultaneously with splits, which in turn makes it difficult to attribute their results to the split announcement. To address this issue, we control for confounding news events in our analysis. Furthermore, we also control for the possibility that analysts are updating their forecasts with some lag, following the splitting firms' strong pre-split performance, using a matched sample approach.

Ikenberry and Ramnath [2002] also analyze analyst forecasts around stock splits. However, they focus on explaining the long-term abnormal return drift after stock splits, by examining to what extent analyst forecasts are biased after the split. In particular, they show that

analyst forecasts for splitting firms remain downward biased following the split announcement relative to matched firms, and interpret the continued bias in analyst forecasts as an under-reaction to the split. In contrast to Ikenberry and Ramnath [2002], we show that irrespective of a potential continued bias in the *forecast level*, analysts do react to the information contained in the stock split and revise their forecast upwards following the announcement. The average analyst revision over a month around the stock split announcement is much larger than the typical revision for the same firms over each of the 12 months following the announcement. Thus, while the level of analyst earnings forecasts may continue to be downward-biased after the split announcement, the stock split announcement is a meaningful information event associated with significant positive forecast revisions.

As a fourth step, to analyze if the past earnings growth is more permanent among splitting firms, the paper examines the actual pre- and post-split earnings growth of splitting firms compared to a matched sample (matched on size, P/E, and past earnings growth). The results show splitting firms experience lower levels of mean-reversion in their earnings growth after the split, compared to the matched firms. In other words, while firms that split their stock experience reduced earnings growth in the years after the split, relative to the growth prior to the split, the post-split earnings growth is higher than the growth for firms with similar past performance. Therefore, the analyst forecast revisions around splits appear to be warranted, assuming the unconditional expected earnings path is similar to that of the matched firms.

Neither liquidity-related theories nor a catering theory predict an increase in analyst earnings forecasts around split announcements, or the pattern in post-split earnings growth we observe. Nevertheless, to further examine these alternative hypotheses for the abnormal returns around split announcements, we also test predictions that are specific to these theories. Under the

catering hypothesis (Baker et al. [2009]), abnormal returns around split announcements should be positively associated with the low-price premium. However, we find an insignificant or negative relation between the low-price premium and the abnormal returns for firms that split their stock. Thus, while Baker et al. [2009] show that managers split their stock when they perceive lower-priced stocks have relatively higher valuations, a catering effect is not the likely driver of the abnormal returns observed around split announcements.<sup>3</sup> To test the tick-size-to-price (relative tick size) hypothesis (Angel, [1997]; Anshuman and Kalay, [1998], [2002]), we examine aggregate splitting behavior and post-split prices around the exogenous changes in the tick size on the NYSE from 1/8<sup>th</sup> to 1/16<sup>th</sup> of a dollar in 1997 and to pennies in 2001. We do not find that splitting activity systematically increases or that splits occur at lower prices following the tick size changes on the NYSE, as predicted by the relative tick size hypothesis.

This paper contributes to the literature by presenting a unified set of results which reconfirm the original information hypothesis that relates the abnormal returns around stock split announcements to the firm's earnings performance. Although recent research on stock splits has largely dismissed the original link between splits and earnings, this paper provides empirical evidence that supports the assumption made in studies that employ stock splits as information events. Our paper proceeds as follows: Section 2 describes our sample. Section 3 presents our findings related to the abnormal returns and analyst forecast revisions around stock split announcements. Section 4 describes our earnings related results. Section 5 addresses the catering, and relative tick size hypotheses. Section 6 concludes.

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<sup>3</sup> One result that is in line with the catering hypothesis is that firms that split using higher split factors (controlling for the pre-split price), thus splitting to lower prices, enjoy higher average abnormal returns around the split announcement during periods when the low-price premium is higher.

## 2 Sample selection and descriptive statistics

Our sample consists of all common stock splits in CRSP (event code 5523) on the NYSE with a split factor  $\geq 5:4$  and a declaration date between 1 January 1988 and 31 December 2007. We start our sample in 1988 since IBES coverage (which we require for our analyst forecast tests) is very limited prior to this year. We also only include stocks that are listed on the NYSE, as these stocks were affected by the tick size regime changes that are employed as a natural experiment in our tests of tick-size based theories. The resulting sample consists of 2097 splits.

Table 1 reports descriptive statistics for the splitting firms. The total number of unique firms in our sample is 1203. The mean number of splits per firm is 1.74 (median 1), and the maximum number of splits by any firm over this period is 9. A majority of splits, 1184 (56%), in our sample have a split factor of 2:1. 816 splits (39%) have a split factor of less than 2:1, 97 splits (5%) have a split factor of greater than 2:1, and the vast majority of these are 3:2 and 3:1 respectively (untabulated). The mean pre-split price (as of two days prior to the declaration date) is \$59.20, with a minimum of \$5.89 and a maximum of \$726.30. The median splitting firm in our sample has 10 analysts following the firm, measured as of the closest consensus estimate to the split declaration date. On average, the splitting firms are also larger and more heavily traded than the average firm on the NYSE during this period.

[Insert Table 1 around here].

In our analysis of the market reaction to stock split announcements, we measure abnormal returns around the announcement dates as the cumulative return net of the value-weighted market return over three trading days (-1 to +1 days) around the split announcement date. For the split announcement date, we use the “declaration date” from CRSP. In some cases,

it is possible that news about the split leaks prior to the official declaration date, but such leaks should only bias against finding any significant abnormal returns in the three-day window.

An important caveat in studies of stock splits is that splits are often announced in conjunction with confounding announcements, which can make it difficult to disentangle whether the market is reacting to the split itself or to the other news released at the same time. Therefore, to measure abnormal returns which are less likely to be contaminated by other information, we separately analyze stock split announcements that do not coincide with quarterly earnings announcements, the issuance of guidance, or announcements of dividend changes within the three-day window around the split announcement. We obtain earnings announcement dates from Compustat. In our sample of 2097 splits, we are able to link 2087 splits to firms in Compustat. For the 10 splits that we cannot link to Compustat, we conservatively assume that there has been an earnings announcement in the window. We obtain dividend announcement dates and dividend amounts from CRSP and define a dividend change announcement as an announcement of any cash dividend (CRSP distribution code 12xx or 13xx) for which the previous announcement of the same type was not of the same amount. We obtain data on the issuance of guidance from the First Call database.

Table 2 reports the number of splits that coincide with confounding announcements. We see that 22% of the splits coincide with an earnings announcement, 39.6% coincide with a dividend change, and 4.8% coincide with the issuance of guidance in the three days around the split announcement. Since some of the announcements overlap, 52.3% of the splits in our sample coincide with at least one of these announcements.

[Insert Table 2 around here]

To analyze the change in the market's expectation of future performance for the splitting firms, we measure the revision in analyst earnings forecasts following the split declaration. To calculate the analyst forecast revision, we use the IBES detailed file to compute an outstanding analyst consensus EPS forecast before and after the split announcement (details on the computation of the analyst consensus is provided in Appendix A1). We analyze changes in the EPS forecast for the *next* full fiscal year after the split announcement to ensure that the forecasts are made at least one year before the announcement of that fiscal year's earnings. For example, if a split is announced in March 2005 for a firm with a December fiscal year-end, we compare EPS estimates (adjusted for the split factor if the ex-date falls between any of the estimates) made before and after the split announcement for the fiscal year-end December 31, 2006. We use this forecast horizon because longer horizons are more likely to be concerned with fundamental long-term firm performance, as opposed to temporary changes in earnings expectations (e.g., resulting from accruals, seasonality, and one-off charges or revenues). We also focus on annual forecasts as opposed to quarterly forecasts for the same reason. To construct a consensus estimate, we require at least three individual analyst EPS estimates in IBES in the 30 days before, as well as in the 30 days after the split announcement. We can thus construct both pre- and post-split consensus estimates for 727 of the splits in our sample.

As in the analysis of abnormal returns, we control for confounding announcements made between the pre- and post-split analyst estimates. To do this, we exclude individual analyst estimates made before and after the declaration date for which a confounding announcement took place between the estimate and the split announcement. We then retain all consensus estimates that consist of at least three "uncontaminated" forecasts both before and after the declaration date. The final sample consists of 198 splits with pre- and post-split consensus EPS

forecasts that are uncontaminated by earnings, guidance, or dividend change announcements (Table 2).

### **3 The earnings information hypothesis, abnormal returns, and analyst forecast revisions**

The hypothesis we examine is one of the original information hypotheses, which attributes the abnormal returns around stock split announcements to information the market infers about firm fundamentals. Fama, Fisher, Jensen, and Roll [1969] introduce this idea in their event study on stock splits. They show unusually high abnormal returns preceding splits (they use the split exercise date and not the declaration date as the event date), that in turn predict increases in future dividends. Grinblatt, Masulis, and Titman [1984] find abnormal returns around both the announcement dates and the exercise dates in their sample, after controlling for a range of news announcements that tend to accompany stock splits. They also find that the abnormal returns around stock splits are higher for non-dividend paying firms, compared to dividend paying firms. They conclude that these results are consistent with an information-based hypothesis, since investors in firms that pay dividends have an alternative mechanism through which to infer information about the fundamental performance of the firm. Finally, Asquith, Healy, and Palepu [1989] attribute the abnormal returns following stock split announcements to the firm's earnings growth. They hypothesize and provide initial evidence consistent with the idea that the strong earnings performance experienced by splitting firms prior to the split announcement is more permanent in nature compared to similar firms. In other words, splitting firms experience lower levels of mean-reversion in their earnings growth following the split, compared to similar firms.

One reason why market participants rationally may update their expectations of future earnings following a split announcement is that while managers may split their stock for multiple reasons, these reasons are likely to be coupled with the manager's belief that the firm is performing well. Ikenberry et al. [1996] refer to the theory where managers condition their decision to split the firm's stock on their optimistic views about the firm's future performance as the "self-selection hypothesis". For example, if managers aim to keep their stock price in a certain range (Baker and Gallagher [1980], Baker and Powell [1992]), and a manager chooses to split the firm's stock because he has private information that it is unlikely that the stock price will decline to the desired range without a split. If this private information is accurate on average, then the market can infer from the split that the future earnings performance should improve relative to the pre-split expectations.

One argument that has been offered against the information hypothesis is that it is not immediately clear what costs are associated with the stock split, which allow it to serve as a credible signal (e.g., Benartzi et al. [2009]). Some potential costs could arise if a firm's stock price falls below a certain threshold, and it fails to meet the exchange's minimum price requirement, or is excluded from the holdings of some institutional investors (with minimum-price rules). Furthermore, a manager may suffer reputational costs if s/he splits the firm's stock and then fails to deliver the 'positive' performance that the market infers from the split announcement. These costs would be in addition to the non-trivial administrative costs associated with the split. However, more importantly, if managers choose to split their firm's stock when they are optimistic about the firm's future performance, then managers who are not optimistic will have no desire to mimic these splitting firms. They will be more concerned with the long-run stock price performance of the firm, as opposed to the relatively small abnormal

returns achieved by announcing a stock split. Therefore, the market can infer information from the manager's actions, even if the manager is not actively signaling his private information. In this paper, we aim to re-examine on variant of this idea first discussed in Asquith, Healy, and Palepu [1989]; that the market infers information about the firm's underlying earnings growth from the split announcement, and that the abnormal returns observed around stock split announcements arise from changes in expectations about the firm's earnings growth.

### *3.1 Abnormal returns and the earnings information hypothesis*

To test the earnings information hypothesis, we begin by re-examining the abnormal returns around stock split announcements. Across all observations, the mean abnormal return over three days around the split announcements is 1.7% [ $t$ -stat 19.50] (Table 3, Panel A). The mean abnormal return is slightly lower, 1.6%, but still positive and significant [ $t$ -stat 12.39] when we exclude observations that coincide with earnings announcements, management guidance, or dividend change announcements (Panel B).

[Insert Table 3 around here]

If the market's reaction to the split announcement is due to new information, the reaction should be stronger for firms where there is otherwise less publicly available information. This idea is similar to that of Grinblatt, Masulis, and Titman [1984], who find that non-dividend payers have higher abnormal returns around splits. In Table 3, we find that the abnormal returns around split announcements are higher for smaller firms (Ikenberry et al. [1996] also find a negative relation between split announcement returns and the firm's size decile). Similarly, abnormal returns are also higher for firms that have fewer analysts following them. When we include both variables, as well as control variables for the overall liquidity of the stock (trading volume and bid-ask spreads), we see that the variation in the number of analysts following the

firm explains most of the cross-sectional variation in announcement returns. In particular, in Panel B, where we exclude observations that coincide with other announcements, the number of analysts following the firm is the only variable which remains significant. Furthermore, in the multiple regression specifications (5)-(7) the liquidity proxies (dollar volume and bid-ask spread) are either insignificant, or suggest that firms with *higher* liquidity before the split announcement are associated with higher abnormal returns.<sup>4</sup>

This new result is important because it implies that the relation between the abnormal returns and the number of analysts following the firm does not result solely from a liquidity effect, and can be attributed to the information environment of the firm. When moving from the 25<sup>th</sup> to the 75<sup>th</sup> percentile of analyst following in our sample, the number of analysts increases from 5 to 17 (see the descriptive statistics in Table 1). Thus, the coefficient on the log number of analysts in Table 3, between -0.007 and -0.008, corresponds to a predicted difference in abnormal returns of around 90 basis points across the inner quartile range of analyst following.

### *3.2 Analyst forecast revisions and the earnings information hypothesis*

To examine if the market updates its expectation about the firm's earnings growth following the split announcement, we analyze whether analysts revise their EPS forecasts around the split announcement. We report results using both the mean and the median analyst forecast as the pre- and post-split consensus around each split announcement. In Panel A of Table 4, we see that the analyst consensus estimates increase following the split announcement. Across all split observations, the average change in the mean analyst forecast normalized by the pre-split stock price ( $\Delta EPS / P$ ) is 0.14%, and highly significant [ $t$ -stat 9.76]. What is important for our analysis

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<sup>4</sup> Expect for one weakly positive coefficient related to the bid-ask spread. Furthermore, because bid-ask spreads are more likely to be missing in our sample, going forward we only use trading volume as a proxy for liquidity. Nevertheless, we find similar results when we also include the bid-ask spread variable.

is that the change remains positive and significant, 0.15% [ $t$ -stat 5.71], even after we exclude observations that coincide with earnings announcements, management guidance announcements, or dividend change announcements; indicating that analysts are not reacting solely to these other types of coinciding news. Our results using consensus estimates based on the median forecast (so that a consensus is not driven by outlier analysts) are very similar. We observe a significant average increase of 0.13% [ $t$ -stats of 8.33 and 4.22] using the median forecasts for the full and non-confounded samples.

[Insert Table 4 around here].

To provide some economic intuition for the magnitude of the earnings forecast revisions, we can multiply the estimate of  $\Delta EPS/P$  by the median P/E value in our sample (17) to translate these units into percent changes in forecasted earnings (at least approximately, as  $(\Delta E/P) * (\text{average } P/E) \approx \Delta E/E$ ). By this logic, the estimate for  $\Delta EPS/P$  of 0.14% corresponds to approximately a 2.4% increase in the average consensus forecast in the full sample, while the estimate after controlling for alternative announcements corresponds to a 2.2% increase in the average earnings forecast. The magnitude of the percent revision in forecasted earnings is very similar to the abnormal returns around split announcements (1.5-1.6%), so the change in earnings expectations could easily justify the abnormal returns in a simple discount-discount model of the stock price if market participants assume that the higher level of expected earnings is persistent.

One potential alternative explanation for the increase in analyst earnings forecasts is that analysts are revising their earnings estimates with some lag following the high past returns that often precede splits, or based on other observables that characterize splitting firms, as opposed to the split announcement per se. To test this alternative explanation, we compare the analyst

forecast revision of the splitting firms to that of two separate sets of matched firms. First, splitting firms on average experience very high returns prior to the split. Thus, to control for the possibility that analysts are adjusting their estimates based on past returns, we identify matched firms based on past one-year returns prior to the split announcement (we also require potential matches to be in the same Fama French 49 industry and size tercile as the splitting firm). As a second matching method, we minimize the distance of an estimated propensity to split between the potential matches that did not split in a given year and the splitting firm (similar to the methodology discussed in Armstrong et al. [2010]). The propensity to split is estimated through annual logit regressions of a split dummy on stock prices and prices squared, returns and lagged returns (and their squares), the standard deviation of returns, market capitalization, dollar volume traded, and market-to-book. We run these predictive regressions using all firms on the NYSE, but excluding Berkshire Hathaway (PERMNO=17778, 83443)<sup>5</sup>.

We analyze the change in analyst consensus for a splitting firm and its match around the same date (30 days before and 30 days after the split announcement date). For both the matched firms and the splitting firms, we compute the analyst forecast revision only for firms for which at least three analyst estimates were updated or reiterated both before and after the split (i.e. we exclude stale estimates). In total, we find 597 and 583 matched consensus estimates when we match on returns and the propensity to split respectively.

While the average change in the mean (median) forecast is positive for the matched sets of firms, it is much smaller than for the splitting firms (Table 4, Panel A). The average change in forecasted EPS/Price using the mean (median) forecast is 0.04% (0.03%) for the matched sample

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<sup>5</sup> The Berkshire Hathaway share classes are extreme outliers in these predictive regressions, as their prices were very high but the company nevertheless did not split their shares during our sample period. The firm nevertheless announced a split for its B-class shares in January 2010.

based on past returns, and 0.04% (0.05%) when we match on the propensity to split; the revision is only significant for the p-matched firms. The difference between the average consensus revision for the splitting firms and that for both of the matched sets of firms is statistically significant. This result holds regardless of the method used for matching, or whether we construct consensus estimates based on mean or median analyst forecasts.

To illustrate the quality of the matches, Panel B of Table 4 reports descriptive statistics for the splitting firms and the matched sets of firms. The prior one-year returns are very high both for the splitting firms and the matches. The propensity-matched firms have more similar past returns compared to the firms that are explicitly matched on past returns, due to the requirement that the returns-based matches also be in the same Fama-French industry and size tercile (which we do not require of the propensity-matched firms). The mean and median size of the splitting firms is also very similar to that of both sets of matched firms, as are the market-to-book and P/E ratios. The prior year earnings growth for the splitting firms is slightly higher than that of the propensity-matched firms, but similar to that of the firms matched on past returns. Based on these results, there appear to be no important differences across observable characteristics between the splitting and matched firms. Thus, the significantly smaller revision experienced by the matched firms alleviates the potential concern that the observed increase in the analyst forecasts for the splitting firms is the result of a delayed reaction to past performance, or due to some other special (observable) characteristic of the splitting firms.

It is important to note that we are not the first to examine analyst forecasts around stock splits. However, the results in this paper differ from those presented in the prior literature in several important ways. Conroy and Harris [1999] show that analysts revise their forecasts following a stock split announcement. However, they do not control for the confounding news

which is often announced in relation to the split. Therefore it is hard to attribute their results to the split announcement. As mentioned earlier, we control for confounding news events in our analysis, which are quite frequent (see Table 2). Furthermore, in contrast to Conroy and Harris [1999] we also control for the possibility that analysts are slow to revise their forecasts and are responding to the splitting firm's prior performance, by using a matched sample approach.

Ikenberry and Ramnath [2002] also look at analyst forecasts in relation to stock splits. However, they focus on explaining the post-split abnormal return drift, by examining the bias of analyst forecasts, among firms that split their stock. They use a matched sample to show that analyst forecasts for splitting firms remain downward biased following the split announcement, relative to the matched firms. They interpret the downward bias in the analyst forecasts following the split announcement as an under-reaction to the split. In contrast to Ikenberry and Ramnath [2002], our results show that irrespective of a potential bias in the forecast *level* after a split, analysts do react to the information contained in the stock split by significantly revising their forecasts upwards following the announcement, and this revision is larger than that for firms with similar past performance.

Furthermore, even though analysts continue to revise their forecasts over time, the revision around the split is particularly large compared to future revisions. In Table 5, we find that the analyst revision over the month around the split announcement is almost twice as large as most of the revisions that occur over each of the 12 months following the split announcement. The results are similar both when we examine the entire sample and when we exclude splits that

are announced with confounding events.<sup>6</sup> These results indicate that while analyst may be biased in their *level* of expectations for splitting firms, the split announcement is a significant information event that analysts react to.

[Insert Table 5 around here]

Next, we analyze whether there is a relation between the analyst forecast revisions and splitting firm characteristics (Table 6). The increase in analyst earnings forecasts is higher for firms with more opaque information environments as measured by fewer analysts and lower market capitalization. We find a significant negative coefficient in simple regressions of the earnings revision on the number of analysts and market capitalization (specifications (1), (2)). When we include both the number of analysts and market capitalization in a multiple regression, as well as a control for liquidity (dollar volume) and year fixed effects (specifications (3)), only the coefficient on market capitalization remains significantly negative. This result is somewhat stronger when we use all observations, but remains significant at the 10% level when we exclude all observations that coincide with confounding announcements. These results are consistent with the results in Table 3, where we find that the abnormal returns around stock split announcements are higher for firms with fewer analysts and lower market capitalization.

Finally, we examine the relation between the abnormal returns around stock split announcements and the analyst forecasts revisions (Table 6, Panel B). The prior results suggest that split announcements by more opaque firms lead to stronger positive reactions by stock market participants and analysts. These results suggest that there is a relation between the cross-

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<sup>6</sup> The revision over month 1 (the revision over the month that includes the split announcement) is slightly different than the revision presented in Table 4, because in constructing the time series we need to use regular monthly snapshots of the consensus forecasts. Therefore, we use forecasts from the IBES summary file in Table 5. In contrast, in Table 4 we do a before-after analysis immediately around the specific split date using individual analyst estimates from the IBES detailed file.

sectional variation in announcement returns, and the cross-sectional variation in analyst forecast revisions. We find that across our entire sample, on average, larger forecast revisions following the split announcement are significantly associated with higher abnormal returns around the split (specifications (1) and (2)). The coefficients imply that an inter-quartile change in the magnitude of the revision in the full sample is associated with approximately a 50 basis point increase in abnormal returns.

[Insert Table 6 around here]

As the information content of the split announcement should be larger for more opaque firms, we interact the forecast revision with firm size to examine whether the positive relation between forecast revisions and abnormal returns is stronger among more opaque firms. We use size as our proxy for the information environment of the firm, because the measure of the consensus forecast revision requires at least three analysts forecasts in a relatively short period both before and after the split announcement, which means that we have much less variation in the number of analysts compared to our analysis in Table 3. Across the entire sample, the interaction term has a limited effect on the relation between the forecast revisions and the abnormal returns. The coefficient for the interaction term is close to zero and statistically insignificant. The coefficient for the forecast revision remains positive but the t-statistic drops to 1.54 in this specification. When we focus on the sample that has no confounding announcements, we find a positive relation that is more pronounced for more opaque firms. We find a positive and significant coefficient for the forecast revisions and a negative and significant coefficient for the interaction term. Taken together, these results suggest that there is cross-sectional variation in the information content of stock split announcements. Firms that experience larger forecast revisions also experience higher announcement returns. For the sample where the stock split

announcement is not accompanied by confounding announcements, this relation comes primarily from smaller more opaque firms for which the split can be more informative. These results are also consistent with the earnings based information hypothesis.

In sum, we find that analysts significantly revise earnings forecasts for the next fiscal year around stock split announcements, while there is a much smaller revision for matched firms. The magnitude of the analyst revisions (2-2.5% of earnings) around split announcements is economically plausible given the average abnormal returns associated with split announcements (1.6% - 1.7%). Furthermore, these analyst revisions are negatively correlated with our proxies for the availability of other public information about the firm (e.g., the number of analysts following the firm and the firm's market capitalization). Finally, the cross-sectional variation in the analyst forecast revisions is positively correlated with the cross-sectional variation in announcement returns.

## **4 Earnings performance**

To relate the analyst revisions following stock split announcements to Asquith et al. [1989]'s original hypothesis that the strong earnings growth experienced by splitting firms prior to the split announcement is more permanent in nature, we examine the future earnings performance of the splitting firms. If the earnings hypothesis is correct, we should observe that while firms that split their stock experience lower earnings growth in the years following the split, relative to the accelerated growth they experience prior to the split, the earnings growth is still larger than the unconditional expectation. This would cause analysts to infer that the prior earnings growth experienced by the splitting firm is less likely to be transitory in nature (i.e. a

smaller portion of the prior earnings is likely to reverse), thus resulting in an upwards revision in the analysts' expectations of future earnings.

To test the hypothesis that splitting firms have less mean reversion in earnings growth, we compare the earnings growth experienced by firms that split their stock in our sample to that of matched firms. We compute earnings growth as the change in annual earnings scaled by lagged total assets. Following the recommendations in Barber and Lyon [1996], we match on size and past performance. We first require potential matches to be in the same size tercile and P/E quintile as the splitting firm during the year of the split (year zero). Out of these potential matches, we pick the firm that has the closest percentage earnings growth to the splitting firm during the year of the split announcement (between fiscal year ends -1 and 0). As a separate set of matches, we pick the firm that has the "most similar" growth over up to four years, ending in the fiscal year of the split announcement (between fiscal year ends -4 and 0). We do this by minimizing the sum of squared differences in the percentage earnings growth between the splitting and matched firms over these years. The advantage of minimizing the sum of squared differences over several years is that the matched firms are more likely to be on a similar earnings path which extends over several years into the past, whereas the firms matched only on the year of the split will naturally have more similar earnings growth for that specific year. Further details on our matching procedure are described in Appendix A2.<sup>7</sup>

Our results on earnings growth are presented in Table 7. Because our sample of splitting and matched firms is likely to be affected by extreme performers (outliers), we focus our

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<sup>7</sup> In untabulated results we also match on industry (Fama French 49 industries), in addition to PE, size, and past earnings growth. Our results related to the splitting firm's future earnings growth is similar, however, in this case the splitting firms outperform the matched firms during past years as well as in the future. Hence we present results for the matched sample described above.

discussion on the median earnings growth and related Wilcoxon test-statistics (also following Barber and Lyon, [1996]).

[Insert Table 7 around here]

In Panel A, we report results using operating income before depreciation as the measure of earnings. When we match based on four years of prior earnings growth, the matched firms experience earnings growth that is similar and statistically indistinguishable from that of the splitting firms in year three before to the split announcement. The splitting firms begin to outperform the matched firms two fiscal years prior to the split and continue to do so for two fiscal years following the split. While both the splitting firms and the matched firms experience significant reversion in their median earnings growth, the earnings growth of the splitting firms in our sample reverts relatively less and returns to normal levels (as defined by the matched firms) in the third year following the split. When we match on one year earnings growth, the splitting and matched firms experience similar earnings growth during the year of the split, but the splitting firms still outperform the matched firms in the two years following the split announcement. In the third year following the split announcement, the splitting firms maintain the same earnings growth rate as that of the matched firms.

For both sets of matches, the splitting firms continue to outperform the matched firms for two full years following the split and maintain their level of increased performance going forward in year three after the split, when they grow at a rate similar to that experienced by the matched firms. We find similar results when we use income before extraordinary items as the measure of earnings (Panel B), except that in this case the splitting firms revert to normal levels in year two following the split. Finally, Panel C of Table 6 shows that the splitting and matched

firms are similar across several dimensions that likely affect future earnings growth: size, market to book, and P/E ratios.

These results show that the earnings growth of the splitting firms in the years prior to the split is less transitory in nature than that of firms with similar past earnings growth and performance. This finding is consistent with market participants correctly expecting splitting firms to have higher future earnings growth relative to the market's unconditional estimate prior to the split announcement. These earnings-based results support our conclusions that it is information about the firm's earnings growth that market participants and analysts react to following the stock split announcement.

## **5 The catering and relative tick size hypotheses**

While only an information hypothesis can explain the results related to analyst forecast revisions and post-split earnings growth that we discuss in the previous sections, there are additional testable predictions specific to the liquidity- and catering-related theories. In this section, we test predictions for the abnormal returns around split announcements and overall splitting activity with respect to the alternative theories in the literature: the catering hypothesis and the relative tick size hypothesis.

### *5.1 The catering hypothesis*

In recent work, Baker et al. [2009] propose that nominal share prices are influenced by catering incentives that managers respond to. In this theory, managers increase the supply of low-priced shares by splitting their stock when there is an increase in demand for low stock prices. Baker et al. [2009] measure the change in demand for low-priced stocks by examining the time series variation in the difference between the market-to-book values for low- versus high-

priced stocks. This difference is labeled the low-price premium.<sup>8</sup> While it is possible that managers split their stock to supply low-priced shares when such shares are perceived to be more valuable, if the market response to the split announcement (the abnormal returns) is driven by a higher demand for low-priced stocks, then *ceteris paribus* we should see a positive correlation between the average abnormal returns around split announcements and the low-price premium. In other words, when the low-price premium is higher, a stock split should be perceived more favorably by investors, thus resulting in higher abnormal returns.

To test this hypothesis, we regress the average cumulative abnormal returns around splits in a given year on the low-price premium for that year. We use the annual low-price premia as reported in Table 2 of Baker et al. [2009]. Our results are presented in Table 8. In regression (1), we find a statistically insignificant negative relation, whereas the catering hypothesis implies a positive one.

[Insert Table 8 around here]

However, since firms split their stock from different pre-split prices and employ different split factors that can vary across years, it is possible that the negative relation between the annual low-price premium and the average abnormal returns results from these omitted variables. Therefore, to further test this hypothesis we regress the individual abnormal returns in our sample on the annual low-price premium, the pre-split price, the split factor, and the interactions of the pre-split price and the split factor with the low-price premium (specifications (2)-(4)). In specification (5), we also control for the number of analysts, market capitalization, and dollar volume as in the previous cross-sectional regressions. When we control for these variables in

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<sup>8</sup> Table 2 of Baker et al. [2009] describes the low-price premium and a similar small stock premium in more detail. We use the low-price premiums presented in their Table 2 for our analysis.

regressions (4) and (5), the relation becomes positive but remains insignificant. The only significant relation we find is negative (specification (3)). In this specification the effect is also economically meaningful as an inter-quintile increase in the low-price premium results in abnormal returns that are 57 basis points lower on average.<sup>9</sup> However, one result that does seem in line with the catering hypothesis is that when controlling for the pre-split price, firms that split using higher split factors, and thus split to lower prices, do indeed enjoy higher average abnormal returns around the split announcement when the low-price premium is high.

## 5.2 *The relative tick size hypothesis*

Another common liquidity-based theory relates liquidity to the tick-size-to-price ratio or the “relative tick size”. The model by Anshuman and Kalay [1998, 2002] explains the benefit of an optimal relative tick size by distinguishing between two elements of the bid-ask spread: i) an asymmetric information component that results from the ratio of informed vs. uninformed traders in the market, and ii) a discreteness-related spread (due to the discreteness of the tick size relative to the stock price). In their model, firms equate the marginal cost and marginal benefit of these two spread components to find the optimal relative tick size. More recently, Lin et al. [2009] present similar arguments in a “trading continuity” hypothesis which also suggests that when a firm faces a possible discontinuity in trading, the firm will split its stock to attract more uninformed traders.<sup>10</sup>

To test these tick size-based theories we examine splitting activity and post-split prices around the tick size regime changes on the NYSE in 1997 and 2001. We assign each stock split

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<sup>9</sup> Note that the low-price premium in Baker et al. [2009] is typically negative, so a higher “premium” thus implies that the difference in the market-to-book between low- and high-price stocks is less negative in a given year.

<sup>10</sup> Lin et al. [2009] do not explicitly link the increased amount of uninformed trading to the relative tick size, but hypothesize that there are other ways that an increase in uninformed trading can take place, such as by reaching an optimal trading range. Similar arguments are made by Harris [1994] and Angel [1997]

to a tick size regime as follows: the first regime ( $1/8^{\text{th}}$  tick size) is from 1 January 1988 to 23 June 1997, the second regime ( $1/16^{\text{th}}$ ) is from 24 June 1997 to 28 January 2001, and the third regime ( $1/100^{\text{th}}$ ) is from 29 January 2001 to 31 December 2007.

The optimal relative tick size hypothesis suggests that splitting activity should increase after a change in tick size (*ceteris paribus*), as firms need to adjust their stock price to the new optimal price-to-tick ratio. Figure 1 plots the number of splits by year. While there is an increase in splitting activity in 1997 and 1998 after the first regime change (184 splits in 1997), splitting activity is very low in 2001 and 2002 (59 splits in 2001) after the second regime change during which the tick size declined the most in relative terms.

As other factors are likely to affect aggregate splitting activity, we perform two sets of time series regressions to test this hypothesis more formally. The dependent variable in the first set of regressions is the fraction of firms on the NYSE that split their stock in year  $t$ . Our results are presented in Table 9, Panel A. Regressions (1)-(4) show that average splitting activity did indeed increase after the first regime change, but declined after the second regime change. This result also holds when we control for the lagged average prices and the contemporaneous equal-weighted return for all firms on the NYSE, as well as when we control for the inter-decile range of prices and returns in each year. The second set of regressions, (5)-(6), are at the firm-year level where the dependent variable is a dummy variable equal to one when a firm announces a split during a given year. Once again the results show that the probability of splitting declines following the regime change to pennies, even after controlling for firms' contemporaneous returns, past price levels, and industry fixed-effects.

[Insert Table 9 around here]

An additional prediction of the optimal relative tick size theory is that on average firms should split to lower post-split prices following the regime changes, to maintain a similar tick-to-price ratio. We test this prediction in Panel B of Table 9 (Figure 1 also presents average post-split prices by year). However, we find that the average prices at which firms split their stock have not monotonically decreased following the two decreases in tick size, even after we control for contemporaneous returns and past prices. The post-split prices are in fact slightly higher in the two latter tick size regimes.

Taken together, our results show that the relative tick size is not maintained following the tick size change on the NYSE. This finding is inconsistent with the hypothesis that the abnormal returns surrounding split announcements are caused by an increase in liquidity achieved via an optimal relative tick size. These results are slightly different than those found by Lipson and Mortal [2006] who find no change in post-split prices following the regime changes and no decrease in splitting activity following the second regime change.

## **6 Conclusion**

Ever since Fama, Fisher, Jensen, and Roll's seminal paper [1969], financial economists have sought to understand why markets react to stocks split announcements, since a stock split appears to be merely a cosmetic transaction that increases the number of shares outstanding and reduces the share price by the split factor. While many theories have sought to explain the presence of abnormal returns around stock splits announcements, our evidence reaffirms the earnings information based explanation discussed in the accounting literature by Asquith et al. [1989].

We find that analysts increase their earnings estimates around stock split announcements, and that the revision is greater for firms with more opaque information environments. Furthermore, the earnings forecast revisions for splitting firms is significantly higher than that for matched firms, indicating that the observed increase in earnings estimates does not result from analysts sluggishly revising their forecasts in response to the splitting firms' past performance. The results also show that the cross-sectional variation in the analyst forecast revisions is positively correlated with the cross-sectional variation in announcement returns.

Finally, we find that the future earnings growth of the splitting firms is higher than that of matched firms with similar past earnings growth, for up to two years following the split. While both the splitting firms and the matched firms experience lower earnings growth in future periods after the split compared to their own past earnings growth, the future earnings growth of the splitting firms is nevertheless higher than that of the matched firms. This result implies that the earnings growth experienced by the splitting firms before the split is less transitory in nature than the pre-split expectations (as proxied by the performance of ex-ante comparable firms). This result helps explain why analysts revise their expectations of future earnings following a split announcement and increase their earnings estimates. This positive change in expectations is likely to be a primary reason why the market views a stock split announcement as favorable news.

While it is possible that managers split their stock to cater to investors that prefer low-priced stocks during certain periods (Baker et al. [2009]), or attract more uninformed investors to their stock (Anshuman and Kalay [1998, 2002], Lin [2009]), our results indicate that the market's reaction to split announcements is not likely to be driven by a response to these managerial motives. In addition to our results which reaffirm the information hypothesis, we find

that in years when the low-price premium is higher, indicating periods where investor preferences for low-priced stocks increased, split announcement returns are not higher on average (and significantly negative in some specifications). Additionally, splitting activity did not increase and post-split prices did not decline following the tick size changes on the NYSE, as predicted by the relative tick size hypothesis. In sum, these results are not consistent with the predictions of the liquidity- and catering-based hypotheses for the abnormal returns observed around stock splits.

Our new evidence supports the hypothesis that while managers often state various motivations for splitting their stock, the market's reaction to stock split announcements is likely driven by information related to the firm's earnings, which the market infers from the split announcement and views as favorable news. An earnings information hypothesis therefore warrants renewed attention as an explanation for the market's reaction to stock split announcements.

## **Appendix**

### *A.1 Computing the outstanding EPS forecast consensus from the I/B/E/S detail file*

To compute the analyst consensus before (after) the split declaration date, we take the mean of all the outstanding estimates in the IBES detail file (adjusted for stopped and excluded estimates) that were made within the 30 days before (after) the split announcement. The forecast period for earnings that we use for our analysis is the next full fiscal year after the split announcement. As an alternative measure of the consensus, we take the median analyst estimate before and after the stock split announcement. We use the unadjusted IBES detail data to avoid the rounding error problem in I/B/E/S (see Diether et al. 2002; Barber and Kang, 2002) and adjust manually for splits using the CRSP share adjustments factor (CFACSHR) to make all estimates comparable. We also exclude outliers that we suspect are mistakes, by excluding all analyst estimates from the consensus that are either more than 1.5 times the mean estimate (of all estimates), or less than half of the mean estimate (of all estimates). This approach results in the exclusion of 0.5% (35 observations) of the analyst estimates made before the announcement and 0.7% (50 observations) of the analyst estimates made after the announcement. Finally, we retain the pre- and post-split consensus estimates only if there are at least three analyst forecasts both before and after the split announcement that form this consensus. The average age of the individual forecasts included in the consensus is 12.2 (11.6) days before (after) the split announcement.

### *A.2 Computing earnings growth for firms that split their stock and for a matched sample of firms*

To compute the earnings growth for firms that split their stock we collect all available annual earnings data on Compustat for the period that extends from three fiscal years before the

split declaration date to four fiscal years following it (including the year of the split defined as year zero). We collect data on operating income before depreciation (data item 13), income before extraordinary items (data item 18) and total assets (data item 6). Our measure of earnings growth is the changes in annual earnings scaled by lagged assets (data item 6). We exclude all splitting firms from the analysis that either have fiscal year changes or missing consecutive annual earnings observations over the period. We also exclude one extreme outlier (PE Corp, Permno 86806, that announced a split on Jan 20, 2000) which experienced an earnings change of (-760%) of assets (or -7.6), in the year before the split.

To create a matched set of firms we first match on market capitalization terciles and P/E quintiles, in the fiscal year of the split announcement date (based on breakpoints for market capitalization and P/E from Kenneth French's website<sup>11</sup>). Potential matches are from the pool of all annual earnings data available on Compustat for regular shares (share code 10, 11) listed on the NYSE at the time of the observation between 1982 and 2007, excluding subsidiaries with a stock ownership code of 1 or 2 and other firms that split during the same year. We use the same logic described above and eliminate firms from consideration when there are either fiscal year changes or missing consecutive annual earnings observations over the potential period. As the matched firm, we choose the firm that has the closest earnings growth during the year of the split (between fiscal year ends -1 and year 0) or the firm that has the "most similar" growth over up to four years ending in the fiscal year of the declaration date (between fiscal year ends -4 and 0), by minimizing the sum of squared differences in earnings growth between the splitting and matched firms over all available observations (up to four). Finally, we compute the future earnings growth for the matched firms.

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<sup>11</sup> [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

## References

- Angel, J., 1997, Tick size, share prices, and stocks splits, *Journal of Finance* 52, 655-681
- Amihud, Y., and H. Mendelson, 1986, Asset pricing and the bid-ask spread, *Journal of Financial Economics*, 17, 223-250
- Anshuman, V., and A. Kalay, 1998, Market making with discrete prices, *Review of Financial Studies*, 11, 88-109
- Anshuman, V., and A. Kalay, 2002, Can splits create market liquidity, Theory and Evidence, *Journal of Financial Markets*, 5, 83-125
- Asquith, P., P. Healy, and K. Palepu, 1989, Earnings and stock splits, *The Accounting Review* 44, 387-403
- Baker, H., and P.L. Gallagher, 1980, Management's view of stock splits, *Financial Management*, 9, 73-77.
- Baker, H., and G.E. Powell, 1992, Why companies issue stock splits, *Financial Management*, 21, 11.
- Baker, M., R. Greenwood, and J. Wurgler, 2009, Catering through nominal share prices, *Journal of Finance*, 64, 2559 - 2590
- Barber, B. M., J. D. Lyon, 1996, Detecting abnormal operating performance: The empirical power and specification of test statistics, *Journal of Financial Economics* 41, 359-399
- Barber, W. R., and S. H. Kang, 2002, The impact of split adjusting and rounding on analysts' forecast error calculations, *Accounting Horizons* 16, 277-289.
- Benartzi, S., R. Michaely, R. Thaler, W. Weld, 2009, The nominal share price puzzle. *Journal of Economic Perspectives* 23(2), 121-42.
- Conroy, R. M., and R. S. Harris, 1999, The Role of Share Price, *Financial Management* 28, 28-40.
- Diether, K., C. J. Malloy, and A. Scherbina, 2002, Differences of opinion and the cross section of stock returns, *Journal of Finance*, Vol. 57, No. 5
- Fama, E., L. Fisher, M. Jensen and R. Roll, 1969, The adjustment of stock prices to new information, *International Economic Review*, 10, 1-21
- Fama, E., K. R. French, 1997, Industry costs of equity, *Journal of Financial Economics* 43, 153-193
- Grinblatt, M., R. Masulis, and S. Titman, 1984, The valuation effects of stock splits and stock dividends, *Journal of Financial Economics*, 13, 461-490

- Han, K.C., 1995. The effects of reverse splits on the liquidity of the stock. *The Journal of Financial and Quantitative Analysis*, Vol. 30, No. 1, 159-169
- Harris, L., 1994. Minimum price variations, discrete bid-ask spreads and quotation sizes. *Review of Financial Studies* 7, 149-178
- Huang, G., K. Liano, and M. Pan, 2006, Do stock splits signal future profitability? *Review of Quantitative Finance and Accounting*, 26, 347-367
- Ikenberry, D., G. Rankine, and E. Stice, 1996, What do stock split really signal? *Journal of Financial and Quantitative analysis*, 31, 357-375
- Ikenberry, D., and S. Ramnath, 2002, Underreaction to self-selected news events: The case of stock splits. *Review of Financial Studies*, 15, 489-526
- Lakonishok, J., and B. Lev, 1987, Stock Splits and stock dividends: Why, who and when, *Journal of Finance*, 42, 913-932
- Lin, J., A. K. Singh, and W. Yu, 2009, Stock splits, trading continuity and the cost of equity capital, *Journal of Financial Economics*, 93 474-489
- Lipson, M., and S. Mortal, 2006 The effect of Stock Splits on Clientele, Is Tick Size Relevant, *Journal of Corporate Finance*, 12, 878-896
- Louis, H., and D. Robinson, 2005, Do managers credibly use accruals to signal private information? Evidence from the pricing of discretionary accruals around stock splits, *Journal of Accounting and Economics*, 39, 361-380
- Muscarella, C., and M. Vetsuypens, 1996, Stock splits: Signaling or liquidity? The case of ADR 'Solo splits', *Journal of Financial Economics*, 42, 3-26
- Nayak, S., and P. R. Prabhala, 2001, Stock splits: Disentangling the Dividend Information in Splits; A Decomposition using Conditional Event-Study Methods, *Review of Financial Studies*, 14, 1083-1116
- Peterson, R.D., and P.P. Peterson, 1992, A further understanding of stock distributions: the case of reverse stock splits, *Journal of Financial Research*, Vol. 15 No. 3, 189-205
- Schultz, P., 2000, Stock splits, Tick size, and Sponsorship, *Journal of Finance* 55, 429-450
- Woolridge, J. R., and D.R. Chambers, 1983, Reverse Splits and Shareholder Wealth, *Financial Management*, Vol. 12 No 3, 5-15

**Table 1.**  
**Descriptive statistics**

This table presents descriptive statistics for splitting firms. The data on split declaration dates is from the CRSP events file. We include splits (CRSP distribution code 5523) for common stock on the NYSE between 1/1/1988 and 12/31/2007 with a split factor  $\geq 5:4$ . The pre-split price is the closing daily price reported on CRSP two days prior to the split announcement. The number of analysts is the number of estimates in the IBES summary file at the date closest to the split declaration date (but no more than 60 days away). Note that we have a larger number of observations of splits with analyst coverage here (2042) than in the analyst revision analysis (727), since for the latter analysis we construct a consensus from the IBES detail file that requires at least 3 estimates to be made both in the 30 days before and after the declaration date. Market cap is from the CRSP monthly file of the month preceding the split announcement. Trading volume is the average monthly dollar trading volume over the 12 months preceding the split announcement. The Bid-ask spread data is taken from the CRSP monthly file. The Bid-ask spread equals the average closing monthly spread, divided by price, over the 12 months preceding the split announcement.

	Mean	Min	Q1	Median	Q3	Max	Std.Dev.	<i>N</i>
Number of splits per firm	1.74	1.00	1.00	1.00	2.00	9.00	1.09	1,203(firms)
Split factor	1.85	1.25	1.50	2.00	2.00	10.00	0.51	2,097
Pre-split price	59.2	5.89	37.4	52.0	74.4	726.3	35.08	2,097
Number of analysts	12.1	1.0	5.0	10.0	17.0	49.0	8.62	2,042
Market cap (\$MM)	7,440	22	654	1,725	5,313	437,976	21,706	2,097
Monthly trading volume (\$MM)	561.9	0.2	29.1	118.5	425.0	47,404	1,645.4	2,097
Bid-ask spread (%)	1.04	0.01	0.40	0.88	1.41	12.2	0.91	1,633

**Table 2.****Number of confounding announcements in the event study windows**

This table reports summary statistics on whether there was a confounding announcement in the windows used for analyzing abnormal returns and analyst forecasts revisions. We examine the presence of earnings announcements, dividend change announcements, and the issuance of guidance in the relevant windows. For the abnormal returns analysis, we examine whether there was a confounding announcement in the window from -1 to +1 trading days around the split declaration date. For the analyst forecast analysis, we identify individual analyst estimates made before and after the declaration date, where a confounding announcement took place between the estimate and the split declaration. We then retain all consensus estimates that consist of at least three non-confounded forecasts before and after the declaration date. We define an earnings announcement as whether there is a quarterly earnings record date in Compustat in the relevant window. If a splitting firm cannot be linked to Compustat at the time of the split (we cannot do so for a total of 10 observations), we assume that there has been an earnings announcement in the window. Dividend announcement dates are from CRSP. We define a dividend change announcement as a declaration of any cash dividend (CRSP distribution codes 12xx or 13xx) in the window for which the previous announcement of the same type was not of the same split-adjusted amount. We define the issuance of guidance as the presence of any type of management forecast in the First Call database, with an announcement date in the relevant window.

	Confounding events around split announcement dates (-1 to +1 days)	
	Frequency	Percent
Earnings Announcement	461	22.0%
No Earnings Announcement	1636	78.0%
<i>Total</i>	2097	100.0%
Dividend Change Announcement	831	39.6%
No Dividend Change Announcement	1266	60.4%
<i>Total</i>	2097	100.0%
Management Guidance	100	4.8%
No management Guidance	1997	95.2%
<i>Total</i>	2097	100.0%
Any confounding event	1098	52.4%
No confounding events	999	47.6%
<i>Total</i>	2097	100.0%
	Confounding events in analyst forecast window (up to 30 days before, and up to 30 days after, the split announcement)	
	Frequency	Percent
Any confounding events	529	72.7%
No confounding events	198	27.3%
<i>Total</i>	727	100.0%

**Table 3.****Abnormal returns around stock split announcements and firm characteristics**

This table analyzes cumulative abnormal returns (net of the value weighted return) in a window from -1 to +1 trading days around the split declaration date. The explanatory variables include the number of analysts, market capitalization, monthly trading volume, bid-ask spreads, and year fixed effects. The number of analysts is the number of estimates in the IBES summary file at the time closest to the split declaration date (but no more than 60 days away). Market cap is from the CRSP monthly file during the month preceding the split announcement, trading volume is the average monthly dollar trading volume over the 12 months preceding the split announcement, and bid-ask spread is the average closing spread (divided by the closing price) over 12 months preceding the split announcement. We use the natural log of market cap, dollar volume and the number of analysts in our regressions. The intercepts report average cumulative abnormal returns (CARs) after controlling for the explanatory variables. The coefficients for the explanatory variables capture the incremental change in the CAR explained by a unit change in the explanatory variable. *t*-stats based on standard errors robust to heteroskedasticity are in parentheses below the coefficient estimates.

Panel A							
Cumulative Abnormal Returns, All observations							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.017*** (19.5)	0.038*** (8.61)	0.034*** (10.22)	0.025*** (10.42)	0.043*** (6.36)	0.048*** (5.72)	0.0500*** (4.93)
Market cap (log)		-0.003*** (-4.89)			-0.003* (-1.86)	-0.004** (-2.17)	-0.005** (-2.15)
Nr of analysts (log)			-0.007*** (-5.57)		-0.008*** (-4.26)	-0.008*** (-3.58)	-0.007*** (-2.63)
Dollar volume (log)				-0.002*** (-3.39)	0.003** (2.35)	0.004** (2.34)	0.004* (1.81)
Bid-ask spread (%)						0.14 (0.87)	0.169 (0.89)
Year effects	No	No	No	No	No	No	Yes
<i>N</i>	2097	2097	2042	2097	2042	1591	1591
<i>R</i> <sup>2</sup>		1.1	1.6	0.5	2.0	2.4	4.0
Panel B							
Cumulative Abnormal Returns, Excluding Confounding Events							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.016*** (12.36)	0.045*** (7.03)	0.034*** (7.71)	0.028*** (8.27)	0.047*** (4.70)	0.040*** (3.35)	0.049*** (3.3)
Market cap (log)		-0.004*** (-4.81)			-0.004 (-1.45)	-0.003 (-1.11)	-0.005 (-1.47)
Nr of analysts (log)			-0.008*** (-4.76)		-0.007*** (-2.79)	-0.008*** (-2.71)	-0.007** (-2.08)
Dollar volume (log)				-0.003*** (-4.01)	0.002 (1.21)	0.003 (1.17)	0.003 (1.05)
Bid-ask spread (%)						0.348* (1.70)	0.301 (1.23)
Year effects	No	No	No	No	No	No	Yes
<i>N</i>	999	999	970	999	970	799	799
<i>R</i> <sup>2</sup>		2.2	2.3	1.5	2.6	3.4	7.3

**Table 4.**

**Analyst EPS forecast revisions around stock split announcements**

This table reports the change in analyst EPS estimates scaled by stock price. The change in the EPS estimate is the difference between the mean (median) of all the outstanding estimates in the IBES detail file (adjusted for stopped and excluded estimates) that were made within 30 days prior to the split announcement, and the mean (median) of all the outstanding EPS estimates made within 30 days following the split announcement, scaled by the stock price prevailing at the end of month prior to the split declaration date. EPS estimates are annual forecasts for the next full fiscal year after the split declaration date. We use the unadjusted IBES detail data and manually adjust estimates for splits using the CRSP share adjustments factor (CFACSHR) to ensure that all estimates are comparable. We also exclude outliers that we suspect are mistakes arising from incorrect split adjustments made by IBES, by excluding all estimates that are either more than 1.5 times the mean estimate for a particular peer group, or less than half of the mean for the same peer group. We winzorise all the remaining estimates at the 1% level.

Panel A reports results for the sample of splitting firms and for two matched samples during the same dates. Specification (1) includes all estimates while specification (2) excludes observations with confounding announcements as defined in Table 2. The first set of matched firms includes firms matched on industry (Fama French 49), past annual returns and size terciles (based on NYSE size breakpoints taken from Ken French's website). The second set of matched firms is created by matching a splitting firm on the propensity score to split in a given year with a firm that did not split that year, where the propensity to split is estimated in a firm-year logit regression for all firms on the NYSE (excluding Berkshire Hathaway) with stock prices and prices squared (lagged one year), returns and lagged returns (and their squares), the standard deviation of returns, market capitalization, dollar volume traded, and market-to-book. Panel B presents descriptive statistics for the splitting firms and the matched firms as of the year prior to the split date.

*t*-stats are reported in parentheses next to the coefficient estimates.

Panel A						
Change in consensus analyst EPS forecast, scaled by price ( $\Delta EPS_F / P$ ) (%)						
	(1) All observations			(2) Excluding observations that coincide with confounding announcements		
<i>Change in consensus based on mean estimates:</i>						
	Estimate	t-stat	N	Estimate	t-stat	N
Splitting firms	0.14***	(9.76)	727	0.15***	(5.71)	198
Firms matched on past returns	0.04	(1.55)	597	0.04	(1.55)	597
Difference	0.10***	(3.49)		0.11***	(2.90)	
P-matched firms	0.04***	(2.20)	583	0.04***	(2.20)	583
Difference	0.10***	(3.83)		0.11***	(3.02)	
<i>Change in consensus based on median estimates:</i>						
Splitting firms	0.13***	(8.33)	727	0.13***	(4.22)	198
Firms matched on past returns	0.03	(1.19)	597	0.03	(1.19)	597
Difference	0.10***	(3.00)		0.10**	(2.28)	
P-matched firms	0.05***	(2.53)	583	0.05***	(2.53)	583
Difference	0.08***	(2.64)		0.08*	(1.94)	

Panel B			
Descriptive statistics of splitting and matched firms			
	Splitting firms	Matched firms based on prior annual returns, industry, and size terciles	Matched firms based on propensity to split
<i>Market cap (\$MM) :</i>			
Mean	6,505	6,368	6,654
Median	1,464	1,460	1,490
Stdev	20,786	20,058	16,159
<i>Market to Book:</i>			
Mean	3.7	3.4	4.7
Median	2.6	2.2	2.5
Stdev	6.3	6.7	22.6
<i>Price/Earnings:</i>			
Mean	31.2	27.0	27.7
Median	17.0	17.0	16.9
Stdev	227.1	78.4	100.54
<i>Prior one-year returns (%):</i>			
Mean	50.5	36.1	48.0
Median	35.9	28.5	33.6
Stdev	65.5	48.6	62.0
<i>Prior year earnings change scaled by assets:</i>			
Mean	2.34	1.44	2.29
Median	1.37	0.94	0.99
Stdev	5.86	6.47	8.94
<i>N</i>	2097	2051	2062

**Table 5.**  
**Analyst forecast revisions over time**

This table analyzes the change in analyst revisions over set monthly intervals around a split, up to 12 months after the split. The analyst estimates are from the IBES summary file. For each monthly anniversary around the split, we obtain the median estimate as of the closest “statistical period” date that precedes the anniversary date. Only summary estimates that are made up of at least 3 analysts are retained. The forecast revision is then calculated as the difference between the (split-adjusted) median estimate in each month less the median estimate in the previous month, scaled by the pre-split price. Results are reported separately for all splits in the sample, as well as only for splits that do not coincide with any confounding announcements (earnings announcement, dividend changes, or management guidance) in a 3-day window around the split.  $t$ -stats based on standard errors robust to heteroskedasticity are in parentheses below the coefficient estimates.

Analyst forecast revision, from previous month	Before split, month	After split, months											
	-1	1	2	3	4	5	6	7	8	9	10	11	12
<b><i>All splits</i></b>													
$\Delta$ Forecast, $t$													
$[(F_{t,i} - F_{t-1,i})/P_i]$ (%)	0.036***	0.088***	0.044***	0.042***	0.034***	0.019***	0.023**	0.032***	-0.012	-0.021**	-0.020*	-0.026**	-0.014
$t$ -stat	(3.52)	(10.82)	(4.07)	(6.85)	(3.94)	(3.03)	(2.46)	(2.70)	(-0.84)	(-1.96)	(-1.86)	(-2.43)	(-1.58)
$N$	1,314	1,443	1,544	1,590	1,617	1,633	1,645	1,651	1,657	1,666	1,669	1,673	1,666
<b><i>Excluding splits that coincide with confounding events</i></b>													
$\Delta$ Forecast, $t$													
$[(F_{t,i} - F_{t-1,i})/P_i]$ (%)	0.050***	0.084***	0.044**	0.060***	0.029**	0.028***	0.039**	0.035	-0.025	-0.033**	-0.026*	-0.045**	-0.017
$t$ -stat	(3.17)	(7.20)	(2.09)	(5.56)	(2.12)	(2.67)	(2.41)	(1.64)	(-0.91)	(-2.02)	(-1.89)	(-2.47)	(-1.09)
$N$	627	681	724	744	754	764	772	778	779	783	783	787	785

**Table 6.****Analyst EPS forecast revisions around stock splits, firm characteristics, and abnormal returns**

This table analyzes the relation between the analyst EPS forecast revisions around the split announcements, firm characteristics, and the split related abnormal returns. The firm characteristics include: the number of analysts, market capitalization, and monthly trading volume. The number of analysts is the number of estimates in the IBES summary file at the time closest to the split declaration date (but no more than 60 days away). Market cap is from the CRSP monthly file during the month preceding the split announcement, and trading volume is the average monthly dollar trading volume over the 12 months preceding the split announcement. The change in the analyst EPS forecast is the difference between the median of all the outstanding estimates in the IBES detail file that were made within 30 days prior to the split announcement and the median of all the outstanding EPS estimates made within 30 days following the split announcement for all annual forecasts for the next full fiscal year after the split declaration date, scaled by the stock price prevailing at the end of month prior to the split declaration date. EPS estimates are further adjusted as described in Table 4.

Panel A presents results related to the relation between the analysts EPS forecast revisions and the firm's information environment. Specifications (1)–(3) include all estimates, specification (4) excludes observations that coincide with confounding announcements. Panel B presents results related to the relation between analysts EPS forecast revisions and the abnormal returns around the split deceleration date. Specifications (1)–(3) include all estimates, specification (4) excludes observations that coincide with confounding announcements.

*t*-stats based on standard errors robust to heteroskedasticity are in parentheses below the coefficient estimates.

Panel A				
Dependent variable: Change in consensus analyst EPS forecast, scaled by price ( $\Delta EPS_F / P$ )				
	(1)	(2)	(3)	(4)
Intercept	0.0041*	0.0047**	0.0071***	0.0025
	(1.87)	(2.31)	(3.09)	(0.55)
Nr of analysts (log)	-0.0008**		-0.0003	-0.0006
	(-1.99)		(-0.52)	(-0.53)
Market cap (log)		-0.0004***	-0.0013***	-0.0007*
		(-3.40)	(-4.29)	(-1.69)
Dollar volume (log)			0.0011***	0.0008
			(3.39)	(1.47)
Year effects	Yes	Yes	Yes	Yes
<i>N</i>	727	727	727	198
<i>R</i> <sup>2</sup>	5.0	5.7	7.6	14.5

Panel B				
Dependent variable: Cumulative abnormal returns				
	(1)	(2)	(3)	(4)
Intercept	0.014*** (9.49)	0.032*** (2.45)	0.028** (2.14)	-0.004 (-0.19)
Analyst EPS change	1.917*** (4.49)	1.794*** (4.17)	3.876 (1.54)	13.59*** (2.85)
Analyst EPS change* Market cap (log)			-0.026 (-0.83)	-1.655*** (-2.82)
Nr of analysts (log)		-0.009 (-1.52)	-0.009 (-1.49)	0.003 (0.28)
Market cap (log)		-0.004 (-1.16)	-0.004 (-1.05)	-0.005 (-0.75)
Dollar volume (log)		0.007** (2.04)	0.007** (2.05)	0.008 (1.42)
Year effects	Yes	Yes	Yes	Yes
<i>N</i>	727	727	727	198
<i>R</i> <sup>2</sup>	7.2	8.1	8.2	12.1

**Table 7.**  
**Earnings growth of splitting and matched firms**

This table reports the mean and median change in annual earnings scaled by lagged total assets, for firms that split their stock, and for a matched set of firms, over the period that extends from 3 fiscal years prior to the split declaration date to 4 fiscal years following the declaration date, including year zero which is the fiscal year of the declaration date. All earnings data is collected from the Compustat annual file. To compute the change in earnings scaled by assets for the sample of splitting firms we exclude all firms from the analysis for which there are either: fiscal year changes or missing consecutive annual earnings observations over the period.

To create a matched set of firms we first match on market capitalization terciles and P/E quintiles, in the fiscal year of the declaration date (based on market-cap and P/E breakpoints taken from Ken French's website). Potential matches are from the pool of all annual earnings data available on Compustat for regular shares (share code 10, 11) listed on the NYSE at the time of the observation between 1982 and 2007, excluding subsidiaries with a stock ownership code of 1 or 2 and other firms that split during the same year. We use the same logic described above and eliminate firms from consideration when there are either: fiscal year changes or missing consecutive annual earnings observations over the potential period. As the matched firm, we either choose the firm that has the closest earnings growth during the year of the split (between year -1 and year 0) or the firm that has the "most similar" growth over the four years ending in the fiscal year of the declaration date (between year -3 and 0), by minimizing the sum of squared differences in earnings growth, between the splitting and matched firms, over all available observations (up to four). Finally, we compute the future earnings growth for the matched firms.

We report results based on two different earnings measures. Operating income before depreciation, and Income before extraordinary items. Panel A reports results using operating income before depreciation for matches based on one year, and for matches based on the past four years (including year 0).

Panel B reports results using Income before extraordinary items, for matches based on one year and the past four years (including year 0). Panel C reports descriptive statistics for the splitting and matched firms across several dimensions. The Wilcoxon test statistic and the Satterthwaite test statistic is computed for all observations in each year count.

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Panel A

With matches based on size, P/E, and past earnings growth over year -3 through year 0

Dependent variable: Operating income before depreciation (change in earnings scaled by assets)

Year relative to split	Median Splitting Firms	Median Matched firms	Wilcoxon test statistic	(N) Splitting Firms	(N) Matched firms	Std. dev Splitting firms	Std. dev Matched firms
-3	0.018	0.018	(0.735)	1810	1789	0.082	0.049
-2	0.023	0.022	(0.066)*	1874	1855	0.074	0.046
-1	0.029	0.026	(0.001)***	1903	1883	0.069	0.046
0	0.032	0.027	(0.000)***	1919	1900	0.067	0.046
1	0.020	0.016	(0.000)***	1738	1710	0.061	0.055
2	0.016	0.013	(0.080)*	1579	1549	0.057	0.067
3	0.012	0.013	(0.392)	1450	1405	0.051	0.056

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With matches based on size, P/E, and past earnings growth over year -1 through year 0

Dependent variable: Operating income before depreciation (change in earnings scaled by assets)

0	0.032	0.031	(0.541)	1919	1890	0.067	0.057
1	0.020	0.016	(0.001)***	1738	1700	0.061	0.078
2	0.016	0.013	(0.046)**	1579	1502	0.057	0.066
3	0.012	0.013	(0.911)	1450	1338	0.051	0.066

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Panel B

With matches based on size, P/E, and past earnings growth over year -3 through year 0

Dependent variable: Income before extraordinary items (change in earnings scaled by assets)

Year relative to split	Median Splitting Firms	Median Matched firms	Wilcoxon test statistic	(N) Splitting firms	(N) Matched firms	Std. dev Splitting Firms	Std. dev Matched firms
-3	0.009	0.009	(0.596)	1873	1750	0.062	0.043
-2	0.012	0.011	(0.048)**	1932	1907	0.056	0.042
-1	0.015	0.013	(0.001)***	1957	1934	0.060	0.036
0	0.016	0.012	(0.000)***	1966	1944	0.051	0.040
1	0.008	0.006	(0.015)**	1782	1750	0.051	0.049
2	0.006	0.006	(0.943)	1616	1595	0.060	0.058
3	0.005	0.006	(0.239)	1485	1447	0.054	0.060

With matches based on size, P/E, and past earnings growth over year -1 through year 0

Dependent variable: Income before extraordinary items (change in earnings scaled by assets)

Year relative to split	Median Splitting Firms	Median Matched firms	Wilcoxon test statistic	(N) Splitting firms	(N) Matched firms	Std. dev Splitting Firms	Std. dev Matched firms
0	0.016	0.016	(0.611)	1966	1959	0.051	0.047
1	0.008	0.006	(0.001)***	1782	1769	0.051	0.057
2	0.006	0.006	(0.278)	1616	1596	0.060	0.068
3	0.005	0.005	(0.576)	1485	1430	0.054	0.080

Panel C

Matched firms descriptive statistics

	Splitting firms	Firms Matched on P/E quintiles, size terciles and past earnings growth in years (-3) through (0)	Firms Matched on P/E quintiles, size terciles and past earnings growth in years (-1) through (0)
<i>Market cap (\$MM):</i>			
Mean	6,619	6,399	5,822
Median	1,520	1,637	1,414
Stdev	21,055	20,377	19,299
<i>Market to Book:</i>			
Mean	3.7	3.7	3.9
Median	2.6	2.6	2.5
Stdev	6.2	4.8	14.7
<i>P/E:</i>			
Mean	31.5	25.6	55.5
Median	17.1	18.2	18.5
Stdev	233.4	51.1	913.6
<i>N</i>	1963	1900	1868

**Table 8.**

**Tests of abnormal returns for the catering hypothesis**

This table analyzes the relation between the cumulative abnormal returns around split announcements, and the low-price premium. The main explanatory variables include the low-price premium as reported by Baker et al. [2009], the pre-split price, and the split factor. The control variables include the number of analysts, market capitalization, and monthly trading volume. The number of analysts is the number of estimates in the IBES summary file at the time closest to the split declaration date (but no more than 60 days away). Market cap is from the CRSP monthly file during the month preceding the split announcement, and trading volume is the average monthly dollar trading volume over the 12 months preceding the split announcement. Specification (1) reports *t*-stats based on standard errors robust to heteroskedasticity in parentheses below the coefficient estimates. Specifications (2) – (5) report *t*-stats based on robust standard errors clustered by year.

Dependent variable: Cumulative Abnormal Returns (%)					
	Avg Yearly CAR	All Obs	All Obs	All Obs	All Obs
	(1)	(2)	(3)	(4)	(5)
Intercept	1.572*** (5.48)	1.568*** (8.78)	4.369*** (4.44)	3.002 (1.31)	3.005 (1.25)
Low Price Premium (VW)	-0.20 (-0.40)	-0.326 (-0.93)	-0.766* (-1.83)	2.871 (0.53)	0.12 (0.02)
Pre-Split Price (log)			-1.064*** (-3.41)	-1.149* (-1.85)	-0.545 (-0.69)
Split factor			0.638*** (2.91)	3.071*** (3.78)	2.601** (2.80)
Pre-Split Price(log)				-1.493 (-1.02)	-0.711 (-0.47)
* Low Price Premium (VW)				1.252** (2.22)	1.052* (1.96)
Split factor(log)					
* Low Price Premium (VW)					
Pre-Split Price(log)				-0.377*** (-2.95)	-0.322** (-2.32)
* Split factor					
Nr of analysts (log)					-0.665*** (-3.32)
Market cap (log)					-0.262 (-1.32)
Dollar volume (log)					0.337** (2.44)
R <sup>2</sup>	1.0%	0.0%	1.2 %	1.6%	2.3%
Number of clusters		18	18	18	18
<i>N</i>	18	1961	1961	1961	1911

**Table 9.**

**Tests of the relative tick size hypothesis: splitting activity and post-split prices**

This table analyzes the relationship between splitting activity, post-split prices, and the tick size regime changes on the NYSE. In Panel A, specifications (1)-(4) are year-level OLS regressions with the fraction of firms on the NYSE that split in a given year as the dependent variable. Specifications (5)-(6) are firm-year linear probability model regressions for all firms on the NYSE with a dummy variable equal to one if a firm splits in year  $t$ , as the dependent variable. We exclude Berkshire Hathaway from the linear probability model regressions. Regime change 1/16<sup>th</sup> is an indicator for the years 1997 and 1998 (the year of and the year after the tick size change from 1/8ths to 1/16ths on the NYSE), and Regime change 1/100<sup>th</sup> is similarly an indicator for years 2001 and 2002. In specifications (1)-(4), Price is the average equal-weighted stock price on the NYSE at year-end of year  $t-1$ , and Return is the equal-weighted return on the NYSE during year  $t$ . The interdecile ranges of Price and Return is the difference between the 90<sup>th</sup> and the 10<sup>th</sup> percentiles of these variables respectively. In specifications (5)-(6), Price is the firm's year-end stock price at year  $t-1$ , and Return is the firm's return during year  $t$ . Specification (6) also includes industry fixed-effects based on the Fama French 49 industries.

Panel B reports year-level OLS regressions with the mean post-split price as the dependent variable. Price, Return, and the interdecile ranges are defined analogously to Panel A.

$t$ -stats based on standard errors robust to heteroskedasticity are in parentheses below the coefficient estimates. Standard errors are also clustered by year in the firm-year level regressions (5) and (6) in Panel A.

Panel A						
Splitting activity						
	Dependent variable: Splitting fraction on the NYSE, year $t$				Dependent variable: Splitting dummy, year $t$	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0380*** (15.75)	0.0592*** (4.57)	0.0557 (3.39)***	0.0658 (2.62)**	-0.0012 (-0.38)	0.0095 (0.40)
Regime change 1/16th	0.0146* (2.02)	0.0173** (2.44)	0.0173** (2.38)	0.0228** (2.52)	0.0139*** (3.50)***	0.0136*** (3.64)
Regime change 1/100th	-0.0150* (-2.07)	-0.0153** (-2.22)	-0.0145* (-1.94)	-0.0176* (-2.10)	-0.0106* (-1.90)	-0.0103* (-1.89)
(Average) price, $t-1$		-0.00084 (-1.66)	-0.00075 (-1.28)	-0.0031 (-1.30)	0.0013*** (7.05)	0.0013*** (6.83)
(Average) return, $t$			0.0061 (0.36)	0.0124 (0.67)	0.0338*** (7.96)	0.0381*** (7.70)
Price interdecile range, $t-1$				0.0015 (0.97)		
Return interdecile range, $t$				-0.0197 (-1.00)		
Industry effects					No	Yes
R <sup>2</sup>	35.6	45.1	45.6	50.0	4.5	5.1
Number of clusters					20	20
$N$	20	20	20	20	52,605	52,605

Panel B				
Dependent variable: Post-split prices, year t				
	(1)	(2)	(3)	(4)
Intercept	27.31*** (30.81)	19.02*** (4.86)	21.20*** (4.32)	6.466 (0.97)
Regime 1/16th	8.845*** (5.53)	7.217*** (4.42)	7.298*** (4.40)	4.256** (2.17)
Regime 1/100th	7.243*** (5.41)	5.071*** (3.22)	5.401*** (3.26)	5.114*** (3.56)
Price, t-1		0.370** (2.16)	0.300 (1.52)	0.371 (0.79)
Return, t			-3.226 (-0.75)	-6.643 (-1.48)
Price interdecile range, t-1				0.119 (0.38)
Return interdecile range, t				10.18* (1.83)
R <sup>2</sup>	72.0	78.4	79.1	87.3
N	20	20	20	20

**Figure 1.**

**Number of splits and post-split prices by year**

This figure shows the number of splits and the mean post-split price by year. We include splits for common stock on the NYSE with a declaration date between 1/1/1988 and 12/31/2007 and with a split factor  $\geq 5:4$ . Post-split prices are computed as the pre-split price (two days prior to the split declaration date), divided by the split factor. The vertical lines represent changes in the tick size regime on the NYSE (from  $1/8^{\text{th}}$  to  $1/16^{\text{th}}$  of a dollar, and from  $1/16^{\text{th}}$  to pennies).

