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

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Abstract:
We re-examine whether the abnormal returns around stock split announcements can be explained by an information hypothesis. Our evidence establishes a link between the abnormal returns and future 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, and the cross-sectional variation in analyst revisions is related to the variation in abnormal returns.

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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 question why we observe these abnormal returns remains an unresolved puzzle. Various theories have been proposed to explain the abnormal returns around split announcements. The earliest theories hypothesize that market participants learn information about firms' fundamentals (e.g. dividends or earnings) from stock splits. Later, alternative theories argue that it is not information, but rather increased liquidity that stocks achieve via splits that is the cause of the 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 times.

In this paper, we present new evidence consistent with the information hypothesis. Namely, that the abnormal returns are caused by market participants inferring positive news about the firm's fundamentals from the split announcement, specifically about future earnings. We show that on average, stock splits result in an immediate increase in the market's expectation of the firm's future earnings, and that stock splits predict actual future earnings changes in a manner that is consistent with these expectations.

This paper is not the first to link stock splits to earnings (see, for example, Lakonishok and Lev [1987] and Asquith et al. [1989]). But more recent literature has nevertheless dismissed the link between the abnormal returns around stock splits and fundamentals, and instead focuses 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]).

These alternative theories have received increased attention because the literature has struggled to interpret the existing evidence on whether stock splits in fact predict improved future
fundamental performance. For example, Lakonishok and Lev [1987] and Asquith et al. [1989] find a pattern of strong earnings growth prior to splits, followed by modest growth afterwards. But Benartzi et al. [2009] raise doubt about whether this should be interpreted as good news, noting that “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.”

Prior research have also struggled to link stock splits to firms’ future abnormal earnings growth, whether compared to a firm’s past growth, or compared to industry peers (e.g. Huang et al. [2006]). However, one issue that plagues the analysis in previous studies is the lack of a clear counterfactual for the post-split earnings growth: What is the correct benchmark when we examine earnings of splitting firms? Furthermore, splits are often announced together with other firm news, such as earnings or dividends, and many papers do not appropriately control for these events, which makes it hard to attribute their findings to the stock split announcement. These conceptual and empirical problems have contributed to the search for alternative theories.

Whether stock splits contain news about earnings is an important question to resolve because many studies employ stock splits to study other questions, while making opposing assumptions about whether or not splits are informative about fundamentals. For example, Louis and Robinson [2005] assume that stock splits represent a “credible signaling device” of information, and study whether the market interprets accruals differently for firms that also split their stock. 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”.

In this paper, we seek to address these problems and reconcile the literature on whether stock splits can be interpreted as good news about fundamentals. We 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.¹ Thus, market participants should revise their future earnings expectations upwards following the split announcement compared to their pre-split expectations, even though the expected growth rate after the split may still be lower compared to an industry benchmark or the same firm's growth prior to the split (particularly if the past growth was very high).

The clearest way to test this hypothesis is to examine how investors’ expectations about the firm’s future earnings changes around the split announcement. While we cannot directly observe every investor's expectations about a firm's earnings, we can observe forecasts by analysts at regular intervals around a split. Therefore, to measure the change in earnings expectations we calculate the difference between the pre-split and post-split analyst estimates. This method thus alleviates the need to search for “matches” to serve as a benchmark or counterfactual.

Using analyst forecasts to measure changes in expectations around split announcements nevertheless raises additional identification challenges which we also address in this paper. Splitting firms tend to perform well prior to the split. Therefore, because analysts may update their forecasts with a lag, it is possible that increases in analyst forecasts following the split could be attributed to the splitting firms’ past performance. We address this concern using various matched sample techniques. Furthermore, splits are often accompanied by other forms of news. Thus, it is important to focus on instances where analysts react to the split as opposed to earnings and divided change announcements. We do so by focusing on analyst revisions that are not accompanied by earnings announcements, dividend change announcements, or management guidance. These concerns when examining analysts data around stock split have not been fully addressed in prior studies (e.g. McNichols and Dravid [1990], Conroy and Harris [1999]).

¹ This hypothesis is similar to Asquith et al. [1989]
We thus seek to bridge the gap in views about the informativeness of stock split announcements by providing a new set of results which attempts to address the conceptual and empirical problems that contributed to the search for alternative theories to the information hypothesis. The aim of our analysis is to show that market participants react to stock splits in a way that is consistent with learning about the firm’s earnings growth.

The empirical analysis proceeds 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.

As a third step, to show that market participants update their expectations about the firm’s future earnings we study the change in analyst forecasts around the stock split announcement. 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. In our full sample, the change in the consensus forecast normalized by the pre-split stock price (ΔEPS/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], after we exclude observations that are potentially confounded by coinciding announcements. Thus, analysts are not reacting solely to other news that tends to accompany stock split announcements. Based on the median P/E in our sample (17), these results translate to approximately a 2.2% - 2.5% increase in the earnings forecasts.
These revisions we document are also 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%. These results alleviate the potential concern that the increase in the analyst forecasts is the result of delayed analyst reaction to past performance. 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.

As a fourth step, we examine whether the future earnings performance of the splitting firms is consistent with the adjustment in market expectations following the split. To do so, 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. Even though splitting firms experience reduced earnings growth in the years after the split compared to their own growth before to the split, the post-split earnings growth is higher than the growth for firms with similar past performance. This implies that the prior earnings growth experienced by the splitting firms is more permanent in nature. Therefore, the increase in analyst earnings expectations around splits appear to be warranted, assuming that the pre-split expected earnings path for the splitting firms is similar to that of the matched firms.

Ikenberry and Ramnath [2002] also analyze analyst forecasts around stock splits. However, they examine a different question: why firms experience abnormal return drifts in the long-run (i.e., over many months) after stock splits. They propose an “under-reaction” explanation, and show that analysts tend to provide downward-biased earnings forecasts for splitting firms, and that this
downward bias continues long after the split. In other words, their evidence suggests that analysts “under-react” to the split information, which is supportive of a broader stock market under-reaction. In contrast, we show that irrespective of a potential continued bias in the forecast level (which we also confirm remains downward-biased compared to matched firms after the split), analysts nevertheless do react positively to the information contained in the stock split by revising their forecast significantly 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, the stock split announcement is a meaningful information event associated with significant positive forecast revisions.

Our question, why the stock market reacts to split announcements, is different from the related question why managers decide to split their stock. 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 fact, CEOs often cite 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.” But while a manager may have multiple reasons for doing a stock split, our evidence is consistent with the hypothesis that the abnormal returns around splits are a result of market participants inferring positive news about the firm’s fundamentals from the split announcement. Consistent with analysts interpreting splits as good news about fundamentals, William Conroy, an analyst in Houston, commented on the Compaq split that “[a split] is a good sign as companies don’t split unless they are feeling good about themselves.”

Thus, as long as a manager’s decision to split is correlated with, or conditional on,

2 Houston Chronicle, July 2, 1997
good private information, market participants can then infer positive news about fundamentals from the split announcement—even though conveying such information may not have been the manager’s intent when deciding on the split.3

This paper contributes to the literature by using improved identification techniques to address the conceptual and empirical problems that contributed to the search for alternative theories to the information hypothesis. We present a new set of results consistent with 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 link between splits and earnings, this paper provides empirical evidence that supports the assumption made in studies that employ stock splits as information events (e.g., Louis and Robinson [2005]).

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 concludes.

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 ≥ 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. 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

3 Various motives could lead to such a correlation between the splitting decision and positive fundamentals. For example, if managers seek to use splits to maintain a desired share price range, then they would be more likely to split their stock when they believe the stock price will not otherwise decline to the targeted price range (Grinblatt et al. [1984], Ikenberry et al. [1996]).
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 information hypothesis attributes the abnormal returns around stock split announcements to information the market learns about firm fundamentals. Fama, Fisher, Jensen, and Roll [1969] introduced this idea in their event study on stock splits, showing that splits predict increases in future dividends. One reason why market participants may rationally update their expectations of future performance 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. For example, if managers aim to keep their stock price in a certain range (Baker and Gallagher [1980], Baker and Powell [1992]), and managers choose to split their firm's stock when they think that it is unlikely that the stock price will decline to the desired range without a split. As a result, the market can infer from the split that the future earnings performance should improve relative to the pre-split expectations. 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”.

A reason why some have considered stock splits to be dubious information events relates to the difficulty in identifying a significant cost associated with a stock split, which is required for a split to be a credible signal (e.g., Benartzi et al. [2009])\(^4\). However, an information hypothesis does not require that managers split their stock with a signaling motive in mind, or in an attempt to distinguish their firm (e.g., as in the model by Brennan and Copeland [1988]). Especially since it is unclear why stock splits would be a manager's preferred way to signal the firm’s underlying value. As long as the manager’s underlying motives for doing a stock split is correlated with, or conditional on, some positive private information about the future (e.g., if managers want to cater to investors who prefer low prices, and employ stock splits if they do not expect the stock price to decrease sufficiently on its own), a split will be interpreted as positive news by the market. This can occur even though conveying this private information may not necessarily be the manager’s intent.

Therefore, it is ultimately an empirical question whether the market interprets stock split announcements as positive news about fundamentals. In this paper, we specifically examine if market participants update their beliefs about a firm’s future earnings growth around split announcements, and if the abnormal returns observed around stock split announcements can be explained by such changes in expectations about the firm’s fundamentals.

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

\(^4\) Some possible costs that have been suggested, in addition to some non-trivial administrative costs associated with a split, result from a firm’s stock price falling below certain thresholds. A too low price may fail to meet the exchange’s minimum price requirement, or could lead a stock to be excluded from the holdings of some institutional investors that have 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.
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.5

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,

5 One exception is weakly positive coefficient on the bid-ask spread, suggesting that firms with higher pre-split bid-ask spreads are associated with higher split announcement returns. 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.
and can be attributed to the information environment of the firm. When moving from the 25th to the 75th 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 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
\((\frac{\Delta E}{P}) * (\text{average } \frac{P}{E} = \frac{\Delta E}{E})\). By this logic, the estimate for \(\Delta \text{EPS}/P\) 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\(^6\). 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

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\(^6\) We use the Fama-French size breakpoints.
market-to-book. We run these predictive regressions using the entire sample, but except Berkshire Hathaway (PERMNO=17778, 83443)\textsuperscript{7}.

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 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.

Panel B of Table 4 reports descriptive statistics for the splitting firms and the matched sets of firms. The mean and median size of the splitting firms is also similar to that of both sets of matched firms, as are the price-to-earnings and market-to-book ratios (one set of the matches has a slightly lower average market-to-book whereas the other matched set of firms has a slightly higher market-to-book). 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

\textsuperscript{7} 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.
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). Based on these results, although some of these differences are statistically significant, there appear to be no important differences across observable characteristics between the splitting and matched firms that could drive the analyst revision result. 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.

Ikenberry and Ramnath [2002] also analyze analyst forecasts around stock splits. However, they examine a different question: why firms experience abnormal return drifts in the long-run (i.e., over many months) after stock splits. They propose an “under-reaction” explanation, and show that analysts tend to provide downward-biased earnings forecasts for splitting firms, and that this downward bias continues long after the split. In other words, their evidence suggests that analysts “under-react” to the split information, which is supportive of a broader stock market under-reaction. In contrast, we show that irrespective of a potential continued bias in the forecast level (which we also confirm remains downward-biased compared to matched firms), analysts nevertheless do react positively to the information contained in the stock split by revising their forecast significantly upwards following the announcement, and this revision is larger than that for firms with similar past performance.

Furthermore, while analysts also continue to revise their forecasts over time after the split, 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.\textsuperscript{8} 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-sectional variation in announcement returns, and the cross-sectional variation in analyst forecast revisions.

\textsuperscript{8} 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.
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 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 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 (size and P/E breakpoints are from Kenneth French’s website). 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 A2.9

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 discussion on the median earnings growth and related Wilcoxon test-statistics.

[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

9 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.
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 7 shows that the splitting and matched firms are very similar across several dimensions that could be associated with future earnings growth: size, market-to-book, and price-to-earnings ratios. The most significant differences are that both sets of matched firms have slightly higher median P/E, which if anything should predict slightly higher future growth for the matched firms rather than the lower growth that we observe.

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 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. Taken together, our evidence shows that the abnormal returns around split announcements are consistent with an earnings information-based explanation.

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.
Our 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 website10). 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.

10 http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
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