

Return drift following stock split announcements

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Abstract

The aim of this study is to examine why underreaction following stock split announcements persists over the long-term. To do so, we analyze long-run abnormal returns after split announcements over the period 1975-2011. A significant abnormal return of 5% p.a. is observed over the entire dataset but this finding is not robust across sub-periods or segregations based on market cap. It is also documented that abnormal returns can be enhanced by focusing on splitting firms that have not split previously within the last three years. A key result of this study is that abnormal returns are conditional on whether firms split again in the next three years. Unsurprisingly, firms that split again perform very well in the year after the current split. However, for the roughly two-thirds of the sample that do not split again, the abnormal return is -11%. This suggests that the *average* long-term underreaction following stock split announcements is difficult to exploit.

Keywords: stock splits, underreaction, post-event drift

JEL classification: G11, G14

1. Introduction

Do investors underreact to stock split announcements and if so, why do they so? These questions have provoked debate amongst financial economists for decades. The famous plot, Figure 2a in Fama, Fisher, Jensen and Roll's (1969) seminal study indicates that there is no drift following splits. In contrast, research by Ikenberry, Rankine and Stice (1996), Desai and Jain (1997) and Ikenberry and Ramnath (2002) documents strong underreaction over the period 1975 to 1997. In an attempt to reconcile these conflicting findings, Byun and Rozeff (2003) show that there is no drift in the earlier Fama et al. (1969) period but that there is drift in the latter period examined by Ikenberry and others. Adding to this, Boehme and Danielsen (2007) contend that underreaction is only observed after the split announcement date but not when measured after the split effective date. The most recent study by Hwang, Keswani and Shackleton (2008) also reports drift following split announcements.

There are a number of important insights that can be drawn from the aforementioned research. First, the existence of underreaction is conditional on the period examined. The only period in which underreaction is consistently observed is 1975 to 1999, which was an elongated bull market preceded by the OPEC oil crisis and which ended with the NASDAQ crash in early 2000. Second, abnormal returns are smaller when measured after the split effective date as opposed to the split announcement date. Third, methodological choices and in particular how a firm's market capitalization is accounted for can affect the magnitude of abnormal returns. In sum though, there is clear evidence of the market underreacting to split announcements during the period 1975 to 1999. Additionally, depending on the method employed, there is also evidence of underreaction in other periods.

The aim of this study is to examine under what conditions underreaction exists following stock splits and to shed light on why this underreaction is present. In addition to analyzing the 1975 to 1999 period where prior research has documented strong underreaction and where the market performed relatively well, we also consider the more recent 2000 to 2011 period, where the market's performance was weak. This dichotomy of strong and weak market periods is central in our attempt to determine under what conditions underreaction exists and perhaps why it does so. We also partition our sample of splitters into large, mid, small and micro caps to examine whether firm size influences underreaction. Further, we consider abnormal returns following both the split announcement and the split effective date. Our key innovation though is to examine the effect of the splitting pattern of

firms on aggregate investor behavior around splits. Specifically, we analyze investor behavior around split announcements for firms that have split within the last three years and those that have not. Similarly, we examine investor behavior around split announcements for firms that will split again within the next three years and those that do not.¹

In aggregate, we document a significant abnormal return of 5% p.a. in the year following split announcements. This drift is focused in the 1975-1999 period – there is no drift from 2000-2011. Abnormal returns are observed in small and micro stocks but not in large and mid-cap stocks. We find that more than half of the drift occurs between the split announcement and effective dates, a period of about 40 days. Over three years, we see reversal, with the abnormal return falling to 3.3%. These findings are broadly consistent with prior research. They also highlight that although underreaction exists, exploiting it is difficult. As there are around 300 splits per year over our sample period, a split trading strategy would require a large amount of trading and capital and thus, it could only feasibly be implemented by an institutional investor. However, an institutional investor would most likely to struggle to exploit underreaction that is concentrated in small and micro stocks, and that only occurs when the overall market's performance is strong.

In our sample, roughly 40% of splitting firms have split previously in the past three years and similarly, around 40% split again in the next three years. The abnormal return for firms that have not split within the past three years increases to 7% p.a. whereas for those that have split previously, the abnormal return is insignificant. Further, for the do no split before firms, underreaction is also observed over three years, in the year after the split effective date, and most importantly, in the weak market period of 2000-2011 and in large cap stocks. These last two results would be of particular interest to institutional investors, as they suggest that a trading strategy that focuses on splitters that have not undertaken

¹ Pilotte and Manuel (1996) and Huang, Liano, Manakyan and Pan (2008) also consider firms splitting patterns. Pilotte and Manuel (1996) segregate firms according to the number of splits they conduct over a 20-year period. They find that the stock price response to splits depends on earnings realizations observed after prior splits. Huang et al. (2008) partition on whether firms have split more than twice in the past five years (frequent splitters) or twice or less (infrequent splitters). This is similar to our division of splitters into those that have split before (in the past three years) and those that have not. They find that changes in the split ratio and liquidity explain the announcement effect for frequent splitters whereas changes in operating performance explain the announcement effect for infrequent splitters. Huang et al. (2008) focus on short-run announcement effects and changes in operating performance. Contrastingly, our examination of splitting patterns is centered on long-run underreaction and its causes.

another split in the past few years is potentially profitable. In comparison to a firm that splits regularly, where the split is more likely to be motivated by a desire to move the stock price to an optimum trading range, when a firm announces its first split in a number of years, the firm's managers are more likely to be signaling confidence about the firm's future prospects (Huang et al., 2008). Thus, the enhanced abnormal returns for splitting firms that have not split previously within the past few years suggest that investors are underreacting to the stronger signal inherent for this group of splitters.

For firms that split again in the next three years, the one-year abnormal return is 31%. Given that Fama et al. (1969), Ikenberry et al. (1996) and others show that firms have a large price run-up in the year or so prior to a split, this result is not particularly surprising. The counterpoint is that for firms that do not split again (about 60% of the sample), the abnormal return is -11%. Thus, positive drift is only observed if firms split again in the next few years. This simple dichotomy highlights that it is the big winners in the right tail, in this case firms that split again, that drive an aggregate underreaction that exists even though the majority of firms perform relatively poorly post split.

Perhaps a more interesting finding arising from the split after/do not split after partition is that the three day cumulative abnormal return (CAR) around the split announcement is significantly higher for firms that split again in the next three years compared with those that do not. This indicates that investors are displaying some ability to discern between splitters that subsequently perform well and poorly. However, they still react positively in firms that do not split again even though these firms subsequently perform poorly and conversely, they do not react positively enough in firms that subsequently perform very well and split again. These findings, and particularly the positive reaction in firms that do not split again, reinforce our conjecture that the aggregate underreaction is driven by firms that subsequently perform very well and split again.

The market's positive reaction to split announcements indicates that these announcements are value relevant signals and as such, they are likely to cause investors to revise their expectations on the firm's future cash flows. To assess this, we consider analysts' forecasts of future earnings both prior to and after split announcements. We find that compared to suitably matched control firms, analysts relatively underestimate the future earnings of splitting firms. This is especially so in the strong market period of 1983 to 1999 and as such, our findings accord with those of Ikenberry and Ramnath (2002). Moreover, we

observe some evidence that the relative underestimation is larger for firms that have not split within the past three years compared with those that have – a result consistent with the greater return drift we see in firms that have not split in the past few years. As expected, the relative underestimation is largest for firms that split again in the next three years. All of these findings suggest that similar to the broader market, analysts are underreacting to split announcements and are slow to revise their performance expectations upwards. However, there is also some evidence that analysts relatively underestimate earnings for firms that do not split again. This is inconsistent with the negative return drift we see for these firms. If it were consistent, then we would observe a relative overestimation of earnings. Thus, there is a disconnect between the market's assessment of these firms and that of the analysts. This disagreement amongst market participants suggests that the broader underreaction story is more nuanced.

Next, we consider dispersion in analysts' forecasts of earnings prior to and following split announcements. As with the forecast error analysis, we measure dispersion in splitting firms relative to their control firms. We find that relative dispersion increases in the year after the split announcement, and especially in the first quarter after the announcement. There is also some evidence that relative uncertainty is higher for firms that split again in the next few years. This suggests that after firms announce splits, their information environment becomes more uncertain. This is particularly so in the split again firms, which are the key drivers of the aggregate underreaction.

Lastly, we examine changes in risk and liquidity around splits. We show that there is a moderate increase in risk after firms announce splits of around 3 to 5%. Firms that have not split before within the past three years have a larger increase in risk than those that have. Firms that split again in the next three years exhibit a larger increase in beta but a smaller increase in total volatility and idiosyncratic volatility relative to firms that do not split again. Overall, there is some evidence that the abnormal returns that splitting firms earn are at least in part a compensation for higher risk, particularly for firms that split for the first time in a number of years. With regards to liquidity, we find that there is an increase in liquidity using Liu's (2006) adjusted zero trading days measure. However, there is no change in liquidity using Amihud's (2002) price impact measure. There is no material difference though in liquidity changes between firms that have not split in the past three years and those that have, and for firms that split again in the next three years and those that do not.

The paper proceeds as follows. Section 2 outlines the data and sample selection criteria. Section 3 describes the measurement of abnormal returns. Section 4 reports descriptive statistics. Section 5 presents the findings of the long-run returns analysis. Section 6 examines the market's reaction to split announcements. Section 7 considers insights from analysts' earnings forecasts. Section 8 analyzes risk and liquidity changes around splits. Section 9 concludes.

2. Data and sample selection

All stock splits during the period 1972 to 2014 as contained on the CRSP file that have a split factor greater than or equal to 25 percent are initially identified. Only splits on common stock (CRSP share codes 10 and 11) are included in the sample. Price data are sourced from CRSP, accounting data from Compustat, analyst forecast data from I/B/E/S, and Fama-French and momentum factors are gathered from Ken French's website. Since this study utilizes size, book-to-market and momentum matching for the long-run return and analyst forecast analysis, splitting firms in the sample have to meet the following criteria: (1) stock price and the number of shares outstanding are available in the month prior to the split announcement; (2) at least six months of returns are available in the 12-month period prior to the announcement date; (3) the Compustat annual files contain information on the firm's book equity in the year prior to the split and (4) the firm's final stock price in the split announcement month must be \$2 or greater (this is to alleviate biases caused by the bid-ask bounce of low priced stocks, as documented by Conrad and Kaul, 1993).

The sample of splits employed for the analysis span the period 1975 to 2011 and number 11,568. Consistent with past studies, most of the splits are either two for one (44.0%) or one for two (36.6%). Splits in 1972-1974 and 2012-2014 are required to identify firms that split before and split after, respectively. The start date of 1975 is chosen to focus on the 1975-1999 period where the stock market performed well and where prior research has documented strong underreaction. The later sub-period from 2000-2011 serves as a holdout sample and it facilitates an examination of investor behavior following splits in a period where on average, the market did not perform well.

3. Measuring long-run abnormal returns

To test for underreaction, buy and hold abnormal returns (BHARs) and the calendar time portfolio regression approach are employed. The expected return of the splitting firm is estimated using the return of a matching firm with the BHAR approach and using an asset pricing model that controls for risk(s) that is known to influence average returns with the calendar time portfolio regression approach.

3.1 Buy and hold abnormal returns

Following Barber and Lyon (1997) and Ikenberry and Ramnath (2002), the expected return of the splitting firm is proxied using the return of a matching firm instead of a reference portfolio because the matching firm approach eliminates the new listing bias, the rebalancing bias and the skewness bias that was documented in Barber and Lyon (1997).

A matching firm is selected by controlling for size, book-to-market and momentum since these firm characteristics are known to influence equity returns. First, 64 size, book-to-market and momentum reference portfolios are constructed as follows: For each month, all NYSE stocks in the population are ranked by size (price times the number of shares outstanding) and four size portfolios are formed based on these rankings. The firm's book-to-market ratio is calculated using the book value of equity for the fiscal year ending in calendar year $t-1$ divided by the market value of common equity. Book equity is the Compustat book value of equity plus deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Preferred stock is the redemption, liquidation or carrying value. Negative book equity firms are excluded. Book-to-market equity, BE/ME , is then the common book equity for the fiscal year ending in calendar year $t-1$, where year t is the current year, divided by the market value of equity of each month in year t . All NYSE firms are ranked based on their book-to-market ratios and another four portfolios are independently formed based on these rankings. Amex and NASDAQ firms are placed in the appropriate NYSE size and book-to-market groups. Finally, firms are independently sorted into four groups based on their preceding 12-month returns. Together this gives 64 portfolios sorted on size, book-to-market and momentum. The reference portfolio of a sample firm is the portfolio that the firm belongs to in the month prior to the announcement date.

Following Ikenberry and Ramnath (2002), to find a matching firm, all firms in each reference portfolio that have not split within the last 12-months are identified. Note that firms

that will split in the future are not excluded because this is not known at the time of the portfolio construction. Within each portfolio, firms are ranked from 1 to n (n is the number of firms in each portfolio) according to their closeness with the splitting firm on size, book-to-market and past 12-month returns. Ranks are summed across these three dimensions and the firm with the lowest rank is selected. If the control firm for some reason stops trading, the proceeds from the delisted firm are invested in the firm with the second lowest sum of ranks.

The abnormal return of a buy and hold strategy that longs the sample firm and shorts the control firm every time a sample firm announces a stock split is calculated as follows:

$$BHAR_{it} = \prod_{t=1}^{\tau} [1 + R_{it}] - \prod_{t=1}^{\tau} [1 + E(R_{it})], \quad (1)$$

where $BHAR_{it}$ is the buy and hold abnormal return, R_{it} is the return of firm i at time t and $E(R_{it})$ is the expected return, which is proxied by the return of a matching firm as discussed above. The calculation of the BHAR begins in the month after a company announces a split. A conventional parametric t-statistic is employed to assess the significance of the BHARs, as Barber and Lyon (1997) find that this test statistic is well specified when the return of a control firm is used to proxy the expected return.

3.2 Calendar time abnormal returns

An alternative way to calculate long-term abnormal returns is the calendar time portfolio approach. The most popular version of this method compares the returns of a portfolio of event firms relative to an asset-pricing model. Mitchell and Stafford (2000) contend that the advantage of the calendar time approach is that the cross-correlation in the returns of the event firms is incorporated into the variance of the portfolio. This is particularly important with self-selected events such as stock splits, which tend to cluster in certain periods or in specific industries. To implement the calendar time approach, equal-weighted portfolios of all firms that announce a split within the last year are formed. The portfolios are rebalanced monthly to remove firms that reach the end of their one-year period and add companies that have just split their shares. Following Mitchell and Stafford (2000), months where the number of firms in the split portfolio is less than 10 are excluded from the analysis. This is to mitigate heteroskedasticity arising from changes in the number of firms in the split portfolio.

As splitting firms typically have a run-up in price before they split, momentum may relate to subsequent returns. Therefore, the Carhart (1997) model, which accounts for

momentum is used instead of the Fama-French (1993) model when calculating abnormal returns. The portfolio excess returns are regressed on the four-factor model as follows:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + s_pSMB_t + h_pHML_t + m_pPRIYR_t + \varepsilon_{pt}, \quad (2)$$

where R_{pt} is the monthly return on the portfolio of splitting firms, R_{ft} is the monthly return on three-month Treasury bills, R_{mt} is the return on the CRSP value-weighted market index, SMB_t is the difference in the returns of value-weighted portfolios of small stocks and big stocks, HML_t is the difference in the returns of value-weighted portfolios of high book-to-market stocks and low book-to-market stocks and $PRIYR_t$ is the difference in the returns of value-weighted portfolios of winner stocks and loser stocks. The intercept α_p measures the average monthly abnormal return on the portfolio of event firms and is commonly referred to as a calendar time abnormal return. A significant positive intercept suggests that splitting firms, on average, earn positive abnormal returns after controlling for risk.

Mitchell and Stafford (2000) argue that the intercept captures both the abnormal return due to the event and the misspecification in the asset pricing model. To control for this potential bias, an arbitrage (zero-investment) calendar time portfolio that is long splitting firms and short control firms is constructed. The returns of this hedge portfolio are then regressed on the Carhart model.

3.3 Market capitalization groupings

Fama (1998) observes that drift in long-run abnormal returns is mitigated and in some cases eliminated if firms are value-weighted rather than equal-weighted. Loughran and Ritter (2000) argue that if a small number of firms comprise a large proportion of a value-weighted portfolio, then unsystematic risk is not diversified away. Therefore, rather than using value-weighted abnormal returns, we estimate equal-weighted abnormal returns across firms with different market capitalizations.

Every month, all firms listed on NYSE, Amex and NASDAQ are ranked based on size in descending order. Next, the population is divided into four categories: large-cap stocks (firms that comprise the top 70% of all companies listed on NYSE, Amex and NASDAQ by market capitalization), mid-cap stocks (firms that are in the 70th to 80th percentile based on market capitalization), small-cap stocks (firms that are in the 80th to 90th percentile based on market

capitalization) and micro stocks (firms that comprise the remaining 10% of the market capitalization). Firms are then allocated in each group accordingly. This classification scheme is very similar to the S&P1500 construction method employed by Standard and Poor's, where the S&P500 index (large-cap stocks) covers 75 percent of the U.S. market cap, and the S&P400 (mid-cap stocks) and the S&P600 (small-cap stocks) comprise seven and three percent of the U.S. market, respectively. Data on the S&P400 index begins in 1991 while the S&P600 index commences in 1994. Since the study begins in 1975, there is not enough data coverage for each of the indices for the full sample. Thus, market cap classifications are constructed as described above. These market cap classifications are used to partition splitting firms into one of the four market cap groups and long-run abnormal returns are examined within each market cap grouping.

4. Descriptive statistics

A split event is classified as "split before" if the firm has split within the last three years and "do not split before" if it has not. Similarly, a split event is defined as "split after" if the firm splits again within the next three years and "do not split after" if it does not.

Panel A of Table 1 shows that the average number of splits per year is 313 and that the number of splits has fallen over time. It is expected that the lowest average number of splits is in the 2000-2011 period, as firms are less likely to split when the market is not performing well. Panel A also shows that roughly 40% of firms split before and 60% do not split before. The figures for the split after partitions are similar, with roughly 40% of firms splitting again and 60% of firms not splitting again. In the last sub-period though, only 28% of firms split again whereas 72% of firms do not. Thus, not only are there fewer splits when the market is not performing well, but firms are less likely to split again in such a market.

[Insert Table 1 about here]

The market cap groupings in Panel B show that there are more splits in the micro-cap stocks (6,850) than there are in the other three capitalization groups combined (4,781). This highlights the importance of controlling for market cap in the analysis, as the aggregate results will be heavily influenced by the micro-cap stocks and these stocks are not as economically important. Panel B also shows that large, mid-cap and small stocks are more likely to have split before than micro stocks. Conversely, as size increases, firms are less likely to split again. Taken together, these results suggest that firms are more likely to split when

they are growing and thus perhaps moving into or up through the small, mid-cap and large stock groups. However, once they establish themselves as larger stocks, they are less likely to split again.

Consistent with Panel B, Panel C shows that firms that split before are larger than those that do not and that firms that split again are smaller than those that do not. In addition, firms that split before have lower book-to-market ratios and higher past returns than firms that do not split before. This is to be expected, as firms that split typically have a run-up in price prior to the split, which also decreases their book-to-market ratios. In contrast, there is little difference in the book-to-market ratios and past returns of firms that split again and those that do not. With the exception of the smaller size of split after firms, there is nothing in the firm characteristics that would suggest that certain firms are more likely to split again than others. Moreover, even though on average, split after firms are smaller, Panel B shows that there are a healthy proportion of split after firms in each market cap grouping.

5. Long-run abnormal returns

5.1 Aggregate results

Table 2 reports one-year abnormal returns following stock split announcements for the period 1975 to 2011. Panel A outlines results for the full sample period, and for the 1975-1987, 1988-1999 and 2000-2011 sub-periods. Both Buy and Hold Abnormal Returns (BHARs) and Calendar Time Abnormal Returns (CTARs) are presented. Since long horizon returns tend to exhibit positive skewness, both mean and median returns are computed for the BHAR analysis. CTARs are calculated for portfolios that are long splitting firms and for arbitrage portfolios that are long split firms and short control firms.

[Insert Table 2 about here]

Panel A shows that the mean BHAR for the full sample period is 5.07% p.a. and that it is statistically significant (t-statistic is 6.75). The median BHAR is smaller in magnitude (3.70%) but is still significant. Ikenberry and Ramnath (2002) also observe that median abnormal returns are smaller. The smaller median BHAR indicates that the distribution of the BHARs is right skewed. The CTARs are consistent with the BHAR results, as both the split portfolio and arbitrage portfolio CTARs are significant. The CTAR for the split portfolio is 5.76% p.a. and thus

is of a similar magnitude to the mean BHAR.² In sum, we document underreaction in the year following stock split announcements for the full sample.

For the sub-period analysis, significant abnormal returns are observed in the 1975-1987 and 1988-1999 periods but not in the 2000-2011 period. The mean BHARS are 4.88%, 6.58% and 3.36%, respectively. The observation of significant abnormal returns in the 1975-1999 period is consistent with prior research by Ikenberry et al. (1996), Desai and Jain (1997) and Ikenberry and Ramnath (2002) who all analyze similar periods. The lack of significance in the 2000-2011 period supports Byun and Rozeff (2003) and Boehme and Danielsen's (2007) conjecture that long-run abnormal returns are sensitive to the time period studied. Given that the stock market performed well over the 1975-1999 period and that the average performance of the stock market over the 2000-2011 period was poor, the findings suggest that underreaction is more likely to be observed in stronger markets. Further, a comparison of the S&P500 returns in Panel A of Table 1 with the abnormal returns in Table 2 for all three sub-periods shows that the stronger the performance of the market, the higher the abnormal return.

Panel B of Table 2 reports mean and median BHARs for large-cap, mid-cap, small-cap and micro-cap stocks for the period 1975-2011.³ The BHARs for large and mid-cap stocks are insignificant whereas those for small and micro stocks are significantly positive. Small and micro stocks generate BHARs of 6.95% and 6.00%, respectively. These findings indicate that the significant BHAR for the full sample is driven by small and micro stocks. This presents a limit to arbitrage for investors, and in particular institutional investors aiming to profit from underreaction following stock split announcements. The results are consistent with those of Ikenberry and Ramnath (2002), Byun and Rozeff (2003) and Boehme and Danielsen (2007).

5.2 Split before and do not split before partitions

A split event is classified as "split before" if the firm has split within the last three years and "do not split before" if it has not. Table 3 presents one-year abnormal returns following stock split announcements for split before and do not split before groups. Panel A reports BHARs

² The CTAR regressions throughout the paper were rerun using weighted least squares (rather than ordinary least squares), where the weight is the number of split firms in the portfolio in a given month. The findings are robust. All unreported results mentioned in the paper are available on request.

³ Due to sample size constraints, CTARs are not calculated for the market cap groups, as reliable calendar time portfolio regressions require at least 10 firms in a portfolio in each month.

and CTARs for the full sample period and sub-periods. The results show that firms that do not split before outperform those that do. The full sample mean BHAR for do not split before firms is a significant 7.09% p.a. whereas the split before BHAR is an insignificant 1.93%. The median BHAR for the do not split before group (4.89%) is smaller than the mean BHAR but is still significant. Thus, similar to the aggregate BHAR in Table 2, the BHAR for the do not split before group is right skewed. Although the mean BHAR for the split before group is not significant, the median BHAR and the CTAR for the split portfolio are.

In sub-period analyses, the mean BHAR for the do not split before group is always significant and always larger than for the split before group. Further, whereas the aggregate BHAR was not significant in the 2000-2011 period, the do not split before BHAR is a healthy 6.05% p.a. in this period. Contrastingly, the mean BHAR for the split before group is only significant in the 1988-1999 period. Panel B presents BHARs for the market cap groupings. The split before mean BHAR is significant in small stocks but insignificant in large, mid-cap and micro stocks. Conversely, the do not split before mean BHAR is significant in all bar the mid-cap stocks.

[Insert Table 3 about here]

Overall, firms that have not split within the past three years perform much better than firms that have in the year after split announcements. This is similar to a result by Huang et al. (2008) who find that infrequent splitters perform better than frequent splitters in the year after a split. Thus, it appears that the market is underreacting to the inherently stronger signal in a firm splitting for the first time in at least three years. For investors trading on stock split announcements, the findings suggest that they should focus on firms that split for the first time in a number of years.

The two most prominent hypotheses for why firms split their stock are the signaling hypothesis (Brennan and Copeland, 1988) and the trading range hypothesis (Copeland, 1979; Baker and Gallagher, 1980). With signaling, managers are indicating to the market that they believe that the future performance of the firm will be strong, as they would be unlikely to announce a split if they think the firm's stock price will fall. The trading range hypothesis contends that managers undertake splits to move their stock price to a desirable range, perhaps for liquidity reasons and/or to broaden the investor base. If a firm announces its first split in a number of years, it is more likely to be driven by signaling in comparison to a firm that splits regularly, where trading range is the more probable cause (Huang et al., 2008).

Thus, the enhanced abnormal returns for splitting firms that have not split previously within the past few years suggest that investors are underreacting to the stronger signal inherent for this group of splitters.

5.3 Split after and do not split after partitions

A split event is classified as “split after” if the firm splits again within the next three years and “do not split after” if it does not. The one-year abnormal returns for both groups are presented in Table 4. For the split after group, the mean BHAR for the full sample is 31.27% p.a. and is highly significant. In contrast, the mean BHAR for the do not split after group is -10.75%, which is also highly significant. The corresponding median BHARs are 23.37% and -5.51% for the split after and do not split after groups, respectively. The median BHARs indicate a strong right (left) skew in the BHARs for the split after (do not split after) samples. Nevertheless, the median BHARs are still large in magnitude and highly significant. The CTAR findings are consistent with those on the BHARs.

[Insert Table 4 about here]

The sub-period results are in accord with those for the full sample. One noteworthy finding is that the mean BHAR for the split after group in the 2000-2011 period is 44.46%, which is much higher than the full period BHAR of 31.27%. Panel A of Table 1 shows that the proportion of split after events during the weaker 2000-2011 period is much lower than in the earlier periods. The smaller proportion of splitting firms in this period that buck the market trend, perform well and subsequently split again, earn very high returns on average prior to their next split. Panel B reports BHARs for the market cap groups. The outperformance (underperformance) of split after (do not split after) firms is also observed in each market cap group. The disparity between the split after and do not split after groups is weaker in the large cap stocks though with the split after (do not split after) group recording a mean BHAR of 22.16% (-5.73%). The theme of observing median BHARs that are smaller in absolute value also occurs in each market cap group.

In summary, the performance of split after firms is excellent and the performance of do not split after firms is poor. Given that firms generally split after a run-up in prices, the performance of split after firms is not that surprising. Perhaps what is surprising is that the magnitude of the abnormal return is so large. The more profound result is the poor performance of do not split after firms, especially considering that the majority of the sample

(62%) does not split again within the next three years. Thus, a simple piece of ex-post information, whether a firm splits again, highlights a fundamental dichotomy in the long-run returns of splitting firms.

For the elongated bull market period of 1975 to 1999, the market underreacts to stock split announcements. The central question which prior research has not adequately addressed is if investors were aware of this underreaction, then why did it persist. We believe that the split after result illuminates why underreaction persists. Specifically, it highlights that the aggregate long-run drift is difficult to exploit because of the cross-sectional volatility and skewness in the long-run returns of splitting firms. The standard event study tests mask the importance of this volatility and right skew and spit out a significant abnormal return. By conditioning the data on a simple piece of ex-post information, we remove this mask and provide clarity on why underreaction persists. When on average, an investor will only earn long-run abnormal returns on splitting firms when the market is performing well and when on average, they lose badly on 62% of splits, the big wins they make on the other 38% of splits might not be enough to compensate them for the risk they bear.

5.4 Three-year abnormal returns

Up to this point, abnormal returns are only examined in the year following split announcements. Given that we look forward three years to identify whether firms split again, it is pertinent to analyze abnormal returns over a three-year horizon. Table 5 outlines these results. Panel A reports three-year abnormal returns whereas Panels B and C present abnormal returns in years two and three, respectively.

[Insert Table 5 about here]

Panel A shows that the three-year mean BHAR for the full sample is 3.27% (t-statistic of 1.91). This is smaller than the one-year BHAR in Table 2, which is 5.07%. Thus, there is reversion in returns after the first year. Panels B and C show that the reversion mainly occurs in the third year where a significant mean BHAR of -2.51% is observed. The median BHAR in Panel A is 4.31% and thus is higher than the mean. This indicates that over three years, the BHARs are left skewed. This is in contrast to the one-year BHARs, which are right skewed. Panel A shows that the CTAR of the split portfolio is significantly positive whereas the CTAR of the arbitrage portfolio is insignificant, which suggests that the abnormal return over three years is not economically large, as its significance is conditional on the method employed. The

reversion in returns between the first and third years is consistent with the findings of Boehme and Danielsen (2007) and Hwang et al. (2008).

The findings for the split before and do not split before samples also demonstrate a reversion in returns. Panel A shows that the split before mean BHAR falls from 1.65% over one year (Table 3) to -2.07% over three years. Similarly, the do not split before BHAR falls from 7.12% over one year to 6.68% over three years but remains significant. As with the full sample, Panel C shows that the reversion mainly occurs in the third year. For the split after and do not split after samples and in contrast to the full sample and the split before groups, there is continuation in returns. In Panel A, the mean BHAR for the split after group is a huge 62.42% over three years. Further, Panels B and C show that the abnormal returns in years two and three are significantly positive. As firms are more likely to split after a run-up in prices and as we identify split after firms as those that split again within the next three years, the continuation in returns for the split after sample is not surprising. The three-year mean BHAR for the do not split after group in Panel A is -32.46%. This is much larger in absolute value than the one-year BHAR in Table 4, which is -10.75%. This is because do not split after firms record significantly negative BHARs in years two and three, which amount to -10.21% and -6.08%, respectively. Therefore, the poor performance of firms that do not split after is not confined to the year after split announcements but extends out to three years. This reinforces our conjecture that trading on stock splits is a very risky proposition. If firms do not split again, then on average, investors long these firms will suffer considerable losses for at least three years.

5.5 Effective date abnormal returns

Byun and Rozeff (2003) and Boehme and Danielsen (2007) find that long-run abnormal returns shrink considerably when calculated following the effective date of the split rather than the announcement date. They contend that firms do not exhibit post-split abnormal returns and that the post-announcement drift only lasts a short duration. We argue that if investors believe that long-run abnormal returns can be earned from trading on stocks splits, then they would trade as soon as the information becomes public, that is, following the announcement date. Thus, the majority of our analysis is conducted after the announcement date. However, in response to the findings of Byun and Rozeff (2003) and Boehme and

Danielsen (2007), we also calculate long-run abnormal returns following the effective date. Table 6 presents the results.

[Insert Table 6 about here]

Panel A shows that the full sample mean BHAR is 2.36% p.a. Although significant, it is smaller than the 5.07% BHAR in Table 2 calculated following the announcement date. In an untabulated result, it is observed that the average (median) number of days between the announcement and effective date is 40 (35). Therefore, consistent with Boehme and Danielsen (2007), we see that abnormal returns are smaller after the effective date and that a considerable portion of the long-run abnormal return following the split announcement is concentrated in the short period between the announcement and effective dates. The BHARs in the 1975-1987 and 1988-1999 periods are also significant but as expected, they are smaller than the corresponding announcement day BHARs in Table 2. The CTARs in these two sub-periods are mostly insignificant though, which suggests that the abnormal returns are not economically meaningful. The median BHARs over the full sample period and in the 1975-1987 and 1988-1999 sub-periods are much closer to the means than they were in Table 2, which indicates that there is less of a right skew in the BHARs after the effective date compared to the announcement date. In the 2000-2011 period and consistent with the announcement date results, the mean BHAR and both CTAR estimates are insignificant. In contrast, the median BHAR is significant, a result that was also observed in Table 2. Thus, although on balance, we conclude that there are no abnormal returns in the 2000-2011 period, the median BHARs suggest that there is weak evidence of positive abnormal returns in this period. The market cap results in Panel B and the results of the split before and split after partitions in Panel C follow the same theme as the announcement date results, the only difference is the abnormal returns are smaller. In summary, the patterns in the abnormal returns after the effective date are consistent with those after the announcement date and in accord with prior research, the key difference is the abnormal returns are smaller.

6. The market reaction to split announcements

Having examined long-run returns one year after the announcement and effective dates, and three years after the announcement date, short-run returns in the three days around the split announcement are now analyzed. Beginning with Grinblatt, Masulis and Titman (1984), numerous studies have documented positive returns when splits are announced. Of particular

importance to this study and what has not been considered previously are the short-run returns of the split before and split after partitions. As we observe that do not split before firms outperform split before firms and that split after firms considerably outperform do not split after firms, an analysis of the short-run returns of these groups will allow us to ascertain whether investors have the ability to identify splitting firms that will subsequently perform well.

The market model is used to calculate short-run abnormal returns where the model parameters are estimated over the period $[-250, -46]$ trading days prior to the split announcement. The abnormal return is the disturbance term from the market model. The return of the CRSP equally-weighted index is used to proxy for the return of the market portfolio, as Brown and Warner (1980) find that tests using the return of a value-weighted index are severely misspecified. The abnormal returns over the $[-1, +1]$ period where day 0 is the announcement date are summed to form the cumulative abnormal return (CAR). A standard parametric t-statistic is employed to infer its significance. Table 7 presents the findings of the short-run CAR analysis.⁴

[Insert Table 7 about here]

As expected and consistent with prior research, the CAR around the announcement date is positive and highly significant. The full sample CAR in Panel A is 2.8% over three days. The CARs over all sub-periods (Panel A) and all market cap groups (Panel B) are also significant. Further, in accord with Ikenberry et al. (1996), it is observed that CARs decrease as firms get larger. Panel C shows that the CARs are significantly positive for the split before, do not split before, split after and do not split after groups. Moreover, do not split before firms earn a significantly higher CAR than split before firms. This is similar to a result documented by Huang et al. (2008) on infrequent and frequent splitters. Further, split after firms earn a significantly higher CAR than do not split after firms. Recall that over one to three year periods, do not split before firms outperform split before firms and split after firms considerably outperform do not split after firms. Given this, the findings on the split before and split after groups are very interesting because they suggest that at the time of the split announcement,

⁴ A number of unreported robustness tests are also conducted. First, in addition to the market model estimations, CARs are also estimated using the constant mean return model. Second, t-statistics for zero standardized CARs are calculated following Patell (1976) and Boehmer, Masumeci and Poulsen (1991). Third, as a complement to the t-test, the Mann-Whitney-Wilcoxon test is used to evaluate the significance of the CAR differences. The findings are robust.

investors are displaying a capacity to determine which firms will subsequently perform better. These results warrant further investigation.

Panel D shows that the difference in CARs between the split before and do not split before groups is insignificant in the 1975-1987 period, significant in the 1988-1999 period and marginally significant in the 2000-2011 period. In Panels E and F, the CAR difference between the split before and do not split before groups is insignificant across all market cap and all book-to-market partitions. Finally, only the second lowest past return quartile in Panel G has a significant difference in CARs. Therefore, the significantly higher CAR observed in Panel C for the do not split before group compared to the split before group is not robust to sub-period analyses and to market cap, book-to-market and past one-year return partitions.

In contrast, Panels D to G show that the significantly higher CAR for split after firms relative to do not split after firms is generally robust. It is significant across all sub-periods in Panel D and all market cap groups except for mid-cap stocks in Panel E. The CAR difference between large-cap stocks is 1.03% and it is more than double the CAR difference in the other three capitalization groups. This suggests that investors are best able to identify which splitting firms will subsequently perform well when firms are large. It may also be a reason why in Table 4, the return difference between split after and do not split after firms in the year following splits is lowest for the large-cap stocks. Panel F shows that the difference in CARs is only significant for the second highest and highest book-to-market groups. Further, the CAR difference increases as book-to-market increases. In Panel G, the difference in CARs is significant in all but the highest past one-year return quartile. Similar to Panel F, there is also a clear pattern in the CAR difference, which falls as past returns increase. All else constant, firms with higher book-to-market ratios or lower past returns are less likely to split. Therefore, it appears that at that time of the split announcement, investors are best able to identify whether firms will subsequently perform better in firms that ex-ante, were least likely to split.

In summary, the short-run CAR analysis in Table 7 has provided some important insights on investor behavior when firms split. Most interestingly, there is evidence that at the time of the split announcement, investors are demonstrating some proficiency in identifying which firms will subsequently perform better and investing accordingly. However, as the CARs on the do not split after groups are always significantly positive, this indicates that investors are not identifying that on average, the firms in these groups subsequently perform poorly. Moreover, the significantly positive CARs support our contention that for the

do not split after group, the market overreacts to the split announcement. Finally, and in aggregate, as there is long-run positive drift observed following splits, the average price reaction when splits are announced is not complete.

7. Insights from analysts' earnings forecasts

7.1 Analysts' earnings forecast errors following split announcements

We employ analysts' earnings forecasts as proxies for investors' expectations about the future earnings of splitting firms and their respective control firms. While this is a common method to evaluate the market's expectation, we acknowledge that analyst forecasts are more likely to represent the expectation of informed investors rather than the entire market.

We examine the market's expectations for split firms and control firms using an approach widely used in previous literature (Easterwood and Nutt, 1999; Gu and Wu, 2003). Specifically, we calculate the mean and t-statistic of the forecast errors across all splitting firms for all forecasts that are made following the split announcement date for the next calendar year given there has to be more than six months and less than 18 months from the split announcement date to the forecast period end date. This is to ensure that analysts have time to incorporate the split information when making their forecasts. The average time from the announcement date to the forecast period end date is 12 months, which coincides with our return horizon. With this approach, we eliminate stale forecasts and only consider the latest forecasts made by an analyst.

We obtain the forecast data from the Detailed I/B/E/S file, where data is rounded to four decimal points. Payne and Thomas (2003) find that rounding forecasts to the nearest penny in the Summary I/B/E/S data file can result in a downward bias in the forecast error for firms that have multiple stock splits. This problem is substantially reduced using the Detailed I/B/E/S file. Next, we calculate the mean forecast error for two separate sample periods: 1983-1999 and 2000-2011. The forecast error is then calculated as follows:

$$FE_i = \frac{EPS_i - Forecast_i}{P_i}, \quad (3)$$

where EPS_i is the actual earnings per share of firm i , $Forecast_i$ is the mean forecast of firm i during the forecast period and P_i is the closing share price of firm i in the month prior to the split announcement date. To reduce the influence of extreme observations, forecast errors

that are greater than 20 per cent in absolute value are deleted. The mean and t-statistic of the forecast errors are then calculated across all split and control firms. For the control firms, we assign an artificial split announcement date which is the date that has the same number of trading days prior to the earnings announcement date as the split firm. A positive (negative) forecast error implies that analysts underestimate (overestimate) the future earnings of the firm.

Panel A of table 8 shows that analysts relatively underestimate the future earnings of splitting firms compared to their control firms. This is evidenced by the significantly positive difference values, particularly during the earlier period from 1983 to 1999 when the market's performance was strong. In addition, there is some evidence that the relative underestimation is larger for firms that have not split within the past three years compared with those that have. This is consistent with the greater return drift observed in firms that have not split in the past few years. As one would expect, the largest relative underestimation occurs in firms that split again in the next three years. These findings are consistent with the notion that in an analogous fashion to the broader market, analysts are also underreacting to split announcements. A somewhat perverse finding is that analysts relatively underestimate the earnings of do not split again firms relative to their controls, particularly for the earlier sub-period. This is contrary to what one would expect given that these firms record negative return drift. With this group of splitters, it appears that analysts' assessment of these firms differs markedly from that of the broader market.

[Insert Table 8 about here]

7.2 Dispersion in analysts' earnings forecasts around splits

In addition to the forecast errors, we also examine the dispersion in analysts' earnings forecasts. This allows us to evaluate how uncertainty is resolved over time for split firms and control firms. Analyst forecast dispersion is calculated following Diether, Malloy and Scherbina (2002). It is the standard deviation of analysts' earnings forecasts divided by the absolute value of the mean analyst forecast. Since forecasts tend to be more accurate closer to the earnings announcement date, as analysts have access to more information when making their forecasts, if we examine the dispersion of annual forecasts over the same sample period, it is likely that the dispersion of analysts' forecasts will fall over time and this does not provide any information on how uncertainty is resolved as a result of the split announcement. To avoid this problem, we study the forecasts made for the firms every earnings quarter one

year prior to one year following the announcement date. Specifically, we calculate the forecast dispersion for every quarter where the forecast period end date is 3, 6, 9 and 12 months prior to and following the split announcement date. If the forecast period end date is within 3 months prior to (after) the split announcement, this is assigned quarter -1 (1). Similarly, quarter -2 (2) corresponds to the forecast period end dates that fall within 6 months prior to and following the split announcements.

The most notable finding in table 9 is that there is a large increase in relative dispersion between split firms and control firms in the quarter following the split announcement. This is particularly so in the earlier period of 1983-1999 in panel A. This indicates that the information environment of firms becomes more uncertain after they announce splits. There is little else in the table of note. One possible exception is that split after firms in the earlier sample period have a much larger relative dispersion compared to do not split after firms in the quarter after the announcement. It seems that analysts disagree more about this particular group of splitters who subsequently perform very well.

[Insert Table 9 about here]

8. Risk and liquidity changes around splits

8.1 Risk changes around splits

To study whether a stock split announcement induces a change in the firms' risk, we calculate the beta, total volatility and idiosyncratic volatilities of splitting firms prior to and following the announcement date. Brennan and Copeland (1988) document an increase in beta following split announcements. However, Wiggins (1992) argue that the increase in beta disappears if monthly data is used instead of daily data. Thus, we use monthly data to calculate beta and the other risk measures for the pre- and post-announcement period. The pre-announcement period is [-36, -1] and the post-announcement period is [+1, +36] where month 0 is the announcement month. Since we identify split before and split after firms using three year horizons, it is consistent and appropriate to consider the change in risk over this interval. Beta is obtained from a CAPM estimation. Total volatility is the standard deviation of returns. Idiosyncratic volatility is the variance of the error term relative to the three-factor Fama-French (1993) model and the four-factor Carhart (1997) model.

Panel A of table 10 shows a moderate increase in risk ranging from 2.88% for IV – Fama-French to 4.92% for beta after firms announce splits. In panel B, we see that it is the

firms that have not split in the past few years that are driving the increase in risk for the aggregate sample. Increases in risk for this group vary from 4.58% to 6.93% whereas for the split before firms, the risk changes are modest. In panel C, the risk changes vary depending on the measure of risk. Split after firms have a large increase in beta of 11.8% but it is the do not split after firms that have increases in both total and idiosyncratic volatility of around 5%. As a whole, these findings provide some evidence to support the notion that the abnormal returns that splitting firms earn are at least in part a compensation for higher risk. This is particularly so for the full sample and for the do not split before firms. However, the very high returns that split after firms earn does not seem to be a compensation for higher risk.

[Insert Table 10 about here]

8.2 Liquidity changes around splits

To examine whether there is a change in stock liquidity as a result of the split, we estimate the Liu (2006) (also used by Lin, Singh and Yu (2009)) and the Amihud (2002) illiquidity measures for splitting firms prior to and after the split date. A reduction in these two measures suggests an improvement in liquidity.

The Liu illiquidity measure is calculated as:

$$LMx = \left[\text{Number of zero daily volumes in prior } x \text{ months} + \frac{\frac{1}{x\text{-month turnover}}}{\text{deflator}} \right] \times \frac{21x}{NoTD} \quad (4)$$

where $x - \text{month turnover}$ is the stock's turnover in the prior x months, $NoTD$ is the number of trading days in the market over the prior x months. In this case x is 12. Following Liu (2006), we set the deflator to 12,000. We calculate the measure in the 12 months prior to the announcement month and in the 12 months following the month the split is effected. If a stock split is a mechanism employed by managers to improve the liquidity of the firm, then the increase in liquidity should occur following the ex-split date. Liu's illiquidity measure is interpreted as the adjusted number of days with zero trading volume over a period. As such, we investigate whether firms experience a decrease in turnover-adjusted no-trade days as a result of the split.

The Amihud illiquidity measure is calculated as follows:

$$ILLIQ_{iy} = \frac{\frac{1}{D_{iy}} \sum_{t=1}^{D_{iy}} |R_{iyd}|}{VOLD_{iyd}} \quad (5)$$

where R_{iyd} is the return of stock i on day d of year y , $VOLD_{iyd}$ is the corresponding dollar daily volume and D_{iy} is the number of days that data is available for stock i in year y . This measure represents the daily impact of the order flow on the firm's share price. The pre-announcement period is 250 trading days before the announcement date and the post-split period is 250 trading days following the ex-split date.

Consistent with Lin, Singh and Yu (2009), panel A of table 11 shows that liquidity increases after firms split according to the Liu adjusted zero trading measure. In all sub-groups in panels B and C, we also see significant increases in liquidity with Liu's measure. However, there is little difference in the magnitude of the increases between the split before and do not split before groups, and the split after and do not split after groups. For the Amihud price impact measure, there are no significant changes in liquidity for all groups. It seems that liquidity is not a contributing factor in explaining the difference in returns between firms that have split before and those that have not, and firms that split again and those that do not.

[Insert Table 11 about here]

9. Conclusion

Long-run return performance following stock splits has been debated by researchers for over 40 years. The weight of evidence in this paper and others indicates that at least for the period 1975 to 1999, the market underreacts to split announcements. The common claim by those arguing against underreaction is that it is specific to certain eras. The absence of drift observed in this study during the weaker market period from 2000 to 2011 supports this claim. Nevertheless, given that underreaction has been observed for over 20 years and that there is evidence, albeit weaker evidence of drift in other periods, the time period specific argument is not compelling. Behavioral models have been proposed to explain why underreaction following corporate actions may occur. The drawback of these models is that do not explain why underreaction persists over the long term. It seems unreasonable to assume that for more than 20 years, psychological biases by investors were constraining learning and thus perpetuating the underreaction.

When splits are announced, the market reacts positively. In the long-run, there will obviously be firms who perform well and others who do not. Our findings show that at the time of the split announcement, investors are displaying an ability to determine which firms subsequently perform better. Despite this, they still react positively to splitting firms that

subsequently perform poorly. The challenge for investors is to infer the information in the split signal and correctly impound this into the price of splitting stocks so that in aggregate, there is no post-split drift observed. Our findings show that on average, investors are correctly impounding the signal in splits when the future performance of the market is weak but that they are underreacting when the future performance of the market is strong.

The demarcation of firms into those that split again and those that do not is an instrument we use to identify the minority of firms that perform very well and the majority who do not perform well post-split. This demarcation allows us to highlight a fundamental dichotomy in the subsequent performance of splitting firms, which provides insight on why on average, investors underreact when the future performance of the market is strong. In a weaker market, the very good performance of the minority is cancelled out by the poor performance of the majority. In a strong market, the very good performance of a larger minority outweighs the poor performance of a smaller majority, which results in aggregate underreaction. Thus, when the future performance of the market is strong, investors are underestimating the degree of right skew in the long-run return distribution of splitting firms and the extent to which firms in the right tail of this distribution will outperform. It is possible that the underreaction observed is driven by behavioral biases but we do not believe that this is the case. It is more likely that it is driven by rational errors in information processing by investors on the future performance of the market and the performance of splitting firms in such a market. If the underreaction documented is caused by rational errors by investors, then this would be consistent with theoretical modeling by Brav and Heaton (2002).

The presence of underreaction following splits for more than 20 years suggests that informed investors were most likely aware of this underreaction. If so, why did they not arbitrage it away? The first key limit to arbitrage is that abnormal returns are concentrated in small and micro stocks. Second, the volatility and right skew in the long-run returns of splitting firms means that investors would have to trade on the vast majority of split announcements to maximize their chance of earning an abnormal return. Third, underreaction is conditional on the strong future performance of the market and thus, to exploit the underreaction, investors would have to be able to forecast the long-run performance of the market. In conclusion, trading on stock splits is not an easy means by which investors can earn long-run abnormal returns, even when the market underreacts to split announcements.

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Table 1

Distribution of stock splits by time period and market capitalization, and characteristics of split firms.

This table reports the distribution of stock splits across different time periods and market capitalizations. The sample is partitioned into “split before” if the firm has split within the last three years and “do not split before” if the firm has not. A split event is defined as “split after” if the firm will split again within the next three years and “do not split after” if the firm will not. S&P500 return is the average annual return on the S&P500 over the relevant period. Panel A reports the distribution of splits across time periods whereas Panel B reports the distribution of splits across market capitalization groups. Panel C reports characteristics for firms partitioned on whether they split before and split after. Size (market cap) is measured in millions and past one-year return is reported on an annual basis. The sample period is 1975-2011.

<i>Panel A: Distribution of stock splits by time period</i>							
Time period	S&P500 return	Total splits	Ave splits per	Split before	Do not split before	Split after	Do not split after
1975-2011	0.0794	11,568	313	4,502 (39%)	7,066 (61%)	4,346 (38%)	7,222 (62%)
1975-1987	0.0911	5,188	399	2,107 (41%)	3,081 (59%)	2,140 (41%)	3,048 (59%)
1988-1999	0.1576	4,380	365	1,589 (36%)	2,791 (64%)	1,724 (39%)	2,656 (61%)
2000-2011	-0.0052	2,000	167	783 (39%)	1,217 (61%)	555 (28%)	1,445 (72%)

<i>Panel B: Distribution of stock splits by market capitalization</i>					
Size Group	Total splits	Split before	Do not split before	Split after	Do not split after
Large-cap	1,396	571 (41%)	825 (59%)	356 (26%)	1,040 (74%)
Mid-cap	1,031	483 (47%)	548 (53%)	352 (34%)	679 (66%)
Small-cap	2,291	1,052 (46%)	1,239 (54%)	800 (35%)	1,491 (65%)
Micro-cap	6,850	2,409 (35%)	4,441 (65%)	2,802 (41%)	4,048 (59%)

<i>Panel C: Characteristics of split firms</i>					
		Split before	Do not split before	Split after	Do not split after
Size (market cap)	Mean	2,953	1,785	1,474	2,704
	Median	288	193	166	278
Book-to-market	Mean	0.36	0.52	0.46	0.45
	Median	0.30	0.43	0.38	0.36
Past one-year returns	Mean	0.98	0.88	0.93	0.91
	Median	0.62	0.54	0.61	0.55

Table 2

Long-run abnormal returns following stock split announcements.

This table reports the equal-weighted average long-run abnormal return following the split announcement date. Abnormal returns are estimated using the Buy and Hold Abnormal Return (BHAR) approach and the calendar time portfolio regression approach. Panel A presents the one-year buy and hold abnormal return and the annualized calendar time abnormal return (CTAR) across different time periods. The estimated monthly CTAR is multiplied by 12 for comparability with the one-year BHAR. Panel B presents the one-year buy and hold abnormal return across different market capitalizations. Numbers in parentheses are the t-statistics of the mean BHAR or the CTAR intercept. Numbers in square brackets are the p-values of the Wilcoxon signed-rank test for the median BHAR. The sample period is 1975-2011.

<i>Panel A: Long-run abnormal returns for different time periods</i>				
	1975-2011	1975-1987	1988-1999	2000-2011
Mean BHAR	0.0507 (6.75)	0.0488 (5.24)	0.0658 (5.17)	0.0336 (1.61)
Median BHAR	0.0370 [0.0000]	0.0419 [0.0000]	0.0412 [0.0000]	0.0282 [0.0010]
CTAR of split portfolios	0.0572 (4.41)	0.0627 (4.06)	0.0542 (3.54)	0.0525 (1.61)
CTAR of arbitrage portfolios	0.0388 (3.79)	0.0498 (3.34)	0.0504 (3.54)	0.0237 (1.06)

<i>Panel B: Buy and hold abnormal returns for different market capitalization groups</i>				
	Large-cap	Mid-cap	Small-cap	Micro-cap
Mean BHAR	0.0146 (1.06)	-0.0037 (-0.18)	0.0695 (4.08)	0.0600 (5.69)
Median BHAR	0.0029 [0.3842]	0.0039 [0.9010]	0.0524 [0.0000]	0.0481 [0.0000]

Table 3

Long-run abnormal returns for the split before and do not split before groups.

This table reports the equal-weighted average long-run abnormal return following the split announcement date for firms that have split within the last three years (split before group) and for firms that have not (do not split before group). Panel A presents the results of the BHAR and CTAR analysis across different time periods while panel B presents the results of the BHAR analysis across different market capitalizations. The sample period is 1975-2011.

<i>Panel A: Long-run abnormal returns for different time periods</i>								
	1975-2011		1975-1987		1988-1999		2000-2011	
	Split before	Do not split before	Split before	Do not split before	Split before	Do not split before	Split before	Do not split before
Mean BHAR	0.0193 (1.61)	0.0709 (7.36)	0.0165 (1.15)	0.0712 (5.83)	0.0451 (2.28)	0.0776 (4.70)	-0.0082 (-0.23)	0.0605 (2.35)
Median BHAR	0.0180 [0.0000]	0.0489 [0.0000]	0.0193 [0.0431]	0.0567 [0.0000]	0.0356 [0.0022]	0.0430 [0.0000]	-0.0078 [0.4936]	0.0427 [0.0002]
CTAR of split portfolios	0.0437 (3.19)	0.0709 (4.62)	0.0486 (2.50)	0.0757 (5.61)	0.0494 (2.73)	0.0590 (3.64)	0.0348 (1.04)	0.0830 (2.17)
CTAR of arbitrage portfolios	0.0061 (0.28)	0.0480 (4.03)	-0.0056 (-0.11)	0.0573 (3.23)	0.0343 (1.78)	0.0619 (3.73)	-0.0197 (-0.54)	0.0469 (2.16)

<i>Panel B: Buy and hold abnormal returns for different market capitalization groups</i>								
	Large-cap		Mid-cap		Small-cap		Micro-cap	
	Split before	Do not split before	Split before	Do not split before	Split before	Do not split before	Split before	Do not split before
Mean BHAR	-0.0104 (-0.39)	0.0321 (2.31)	-0.0270 (-0.86)	0.0172 (0.64)	0.0496 (2.10)	0.0862 (3.54)	0.0226 (1.26)	0.0803 (6.17)
Median BHAR	-0.0216 [0.4474]	0.0137 [0.0527]	-0.0355 [0.1810]	0.0419 [0.1521]	0.0345 [0.0031]	0.0600 [0.0000]	0.0365 [0.0006]	0.0590 [0.0000]

Table 4

Long-run abnormal returns for the split after and do not split after groups.

This table reports the equal-weighted average long-run abnormal return following the split announcement date for firms that will split again within the next three years (split after group) and for firms that will not (do not split after group). Panel A presents the results of the BHAR and CTAR analysis across different time periods while panel B presents the results of the BHAR analysis across different market capitalizations. The sample period is 1975-2011.

<i>Panel A: Long-run abnormal returns for different time periods</i>								
	1975-2011		1975-1987		1988-1999		2000-2011	
	Split after	Do not split after	Split after	Do not split after	Split after	Do not split after	Split after	Do not split after
Mean BHAR	0.3127 (22.00)	-0.1075 (-13.64)	0.2493 (15.23)	-0.0917 (-8.98)	0.3423 (14.78)	-0.1121 (-8.40)	0.4446 (8.64)	-0.1283 (-6.56)
Median BHAR	0.2337 [0.0000]	-0.0551 [0.0000]	0.2023 [0.0000]	-0.0402 [0.0000]	0.2568 [0.0000]	-0.0699 [0.0000]	0.3273 [0.0000]	-0.0540 [0.0000]
CTAR of split portfolios	0.2720 (18.59)	-0.0652 (-4.66)	0.2323 (11.28)	-0.0598 (-4.34)	0.2726 (12.46)	-0.0817 (-5.19)	0.3553 (10.79)	-0.0547 (-1.52)
CTAR of arbitrage portfolios	0.2285 (12.19)	-0.0853 (-6.05)	0.1937 (8.33)	-0.0776 (-3.23)	0.2691 (11.29)	-0.0880 (-6.05)	0.2585 (5.52)	-0.0780 (-2.93)

<i>Panel B: Buy and hold abnormal returns for different market capitalization groups</i>								
	Large-cap		Mid-cap		Small-cap		Micro-cap	
	Split after	Do not split after	Split after	Do not split after	Split after	Do not split after	Split after	Do not split after
Mean BHAR	0.2216 (6.48)	-0.0573 (-4.27)	0.2695 (7.41)	-0.1441 (-6.23)	0.3301 (8.51)	-0.0738 (-5.17)	0.3246 (18.31)	-0.1267 (-10.53)
Median BHAR	0.1402 [0.0000]	-0.0415 [0.0001]	0.1867 [0.0000]	-0.0958 [0.0000]	0.2557 [0.0000]	-0.0346 [0.0001]	0.2526 [0.0000]	-0.0623 [0.0000]

Table 5

Three-year abnormal returns following stock split announcements.

This table reports equal-weighted average long-run abnormal returns in the three-year period following the split announcement date. Results are reported for the full sample and also for firms partitioned on whether they have split before and whether they split after. Panel A presents the three-year abnormal return following the announcement date, Panel B presents the abnormal return in the second year after the split announcement and Panel C presents the abnormal return in the third year after the split announcement. The monthly CTAR estimate has been multiplied by 36 in Panel A and 12 in Panels B and C. The sample period is 1975-2011.

<i>Panel A: Three-year abnormal returns</i>					
	Full sample	Split before	Do not split before	Split after	Do not split after
Mean BHAR	0.0327 (1.91)	-0.0207 (-0.83)	0.0668 (2.89)	0.6242 (18.78)	-0.3246 (-18.70)
Median BHAR	0.0431 [0.0000]	0.0207 [0.2397]	0.0634 [0.0000]	0.5095 [0.0000]	-0.1077 [0.0000]
CTAR of split portfolios	0.0620 (2.03)	0.0256 (0.70)	0.0787 (2.75)	0.4231 (10.30)	-0.1584 (-5.32)
CTAR of arbitrage portfolios	0.0004 (0.02)	-0.0185 (-0.53)	0.0228 (1.07)	0.3674 (8.86)	-0.2116 (-10.06)

<i>Panel B: Abnormal returns in year two</i>					
	Full sample	Split before	Do not split before	Split after	Do not split after
Mean BHAR	-0.0029 (-0.43)	-0.0067 (-0.62)	-0.0005 (-0.06)	0.1614 (13.93)	-0.1021 (-12.79)
Median BHAR	-0.0007 [0.4699]	-0.0037 [0.9780]	0.0013 [0.3643]	0.1380 [0.0000]	-0.0615 [0.0000]
CTAR of split portfolios	0.0077 (0.55)	-0.0094 (-0.62)	0.0125 (0.92)	0.1211 (7.37)	-0.0566 (-4.25)
CTAR of arbitrage portfolios	-0.0019 (-0.24)	-0.0021 (-0.17)	-0.0012 (-0.13)	0.1187 (8.13)	-0.0679 (-7.42)

<i>Panel C: Abnormal returns in year three</i>					
	Full sample	Split before	Do not split before	Split after	Do not split after
Mean BHAR	-0.0251 (-3.37)	-0.0256 (-2.58)	-0.0248 (-2.38)	0.0341 (2.37)	-0.0608 (-7.450)
Median BHAR	0.0023 [0.2844]	-0.0035 [0.1086]	0.0051 [0.9385]	0.0372 [0.0000]	-0.0244 [0.0000]
CTAR of split portfolios	0.0079 (0.56)	0.0020 (0.12)	0.0098 (0.76)	0.0558 (3.55)	-0.0280 (-1.91)
CTAR of arbitrage portfolios	-0.0200 (-2.36)	-0.0314 (-2.16)	-0.0187 (-2.00)	0.0272 (1.64)	-0.0509 (-5.65)

Table 6

Long-run abnormal returns following the split effective date.

This table reports the equal-weighted average long-run abnormal return following the effective date. Panel A presents the results across different time periods, Panel B presents the results across different market capitalization groups and Panel C presents the results for firms partitioned on whether they have split before and whether they split after. The sample period is 1975-2011.

<i>Panel A: Buy and hold abnormal returns for different time periods</i>				
	1975-2011	1975-1987	1988-1999	2000-2011
Mean BHAR	0.0236 (3.41)	0.0333 (3.72)	0.0260 (2.13)	0.0022 (0.13)
Median BHAR	0.0232 [0.0000]	0.0267 [0.0000]	0.0149 [0.0221]	0.0314 [0.0038]
CTAR of split portfolios	0.0279 (2.07)	0.0268 (1.84)	0.0190 (1.43)	0.0226 (0.72)
CTAR of arbitrage portfolios	0.0261 (2.42)	0.0269 (1.46)	0.0269 (2.18)	0.0218 (0.93)

<i>Panel B: Buy and hold abnormal returns for different market capitalization groups</i>				
	Large-cap	Mid-cap	Small-cap	Micro-cap
Mean BHAR	0.0084 (0.60)	-0.0068 (-0.37)	0.0300 (1.86)	0.0295 (3.06)
Median BHAR	-0.0046 [0.9008]	0.0071 [0.8572]	0.0176 [0.0254]	0.0417 [0.0000]

<i>Panel C: Buy and hold abnormal returns for split before and split after groups</i>				
	Split before	Do not split before	Split after	Do not split after
Mean BHAR	0.0077 (0.71)	0.0336 (3.73)	0.2720 (20.41)	-0.1221 (-16.95)
Median BHAR	0.0110 [0.0298]	0.0316 [0.0000]	0.2143 [0.0000]	-0.0577 [0.0000]
CTAR of split portfolios	0.0150 (1.10)	0.0387 (2.44)	0.2302 (15.15)	-0.0918 (-6.26)
CTAR of arbitrage portfolios	0.0082 (0.48)	0.0365 (2.92)	0.2079 (10.20)	-0.0915 (-7.81)

Table 7

Short-run cumulative abnormal returns around stock split announcements.

This table reports the three-day cumulative abnormal return (CAR) around the split announcement date. The market model is used to estimate the CAR. Panel A presents the results across different time periods, Panel B presents the results across different market capitalization groups and Panel C presents the results for firms partitioned on whether they have split before and whether they split after. Panels D through G present the results for firms partitioned on whether they have split before and whether they split after, and which are then further partitioned on time period (Panel D), market capitalization (Panel E), book-to-market (Panel F) and past one-year returns (Panel G). In addition to the CARs, the difference in CARs between split before and do not split before groups, and split after and do not split after groups is also reported in Panels C through G. The sample period is 1975-2011.

<i>Panel A: CARs for different time periods</i>			
1975-2011	1975-1987	1988-1999	2000-2011
0.0280	0.0321	0.0236	0.0261
(47.96)	(38.94)	(25.97)	(17.39)

<i>Panel B: CARs for different market capitalization groups</i>			
Large-cap	Mid-cap	Small-cap	Micro-cap
0.0104	0.0146	0.0183	0.0370
(9.16)	(10.14)	(17.04)	(43.71)

<i>Panel C: CARs for split before and split after groups</i>						
	Split before	Do not split before	Difference	Split after	Do not split after	Difference
	0.0266	0.0290	-0.0024	0.0322	0.0255	0.0067
	(29.89)	(37.54)	(-2.00)	(34.18)	(34.33)	(5.57)

<i>Panel D: CARs for split before and split after groups sorted by time period</i>						
	Split before	Do not split before	Difference	Split after	Do not split after	Difference
1975-1987	0.0317	0.0324	-0.0007	0.0359	0.0295	0.0064
	(25.67)	(29.35)	(-0.40)	(27.86)	(27.54)	(3.80)
1988-1999	0.0213	0.0249	-0.0035	0.0259	0.0220	0.0039
	(15.43)	(20.94)	(-1.96)	(17.86)	(18.98)	(2.09)
2000-2011	0.0226	0.0283	-0.0057	0.0336	0.0231	0.0105
	(9.86)	(14.35)	(-1.88)	(11.73)	(13.16)	(3.13)

Panel E: CARs for split before and split after groups sorted by market capitalization

	Split before	Do not split before	Difference	Split after	Do not split after	Difference
Large-cap	0.0101 (5.00)	0.0106 (8.10)	-0.0005 (-0.17)	0.0180 (7.55)	0.0078 (6.08)	0.0103 (3.82)
Mid-cap	0.0154 (6.88)	0.0139 (7.50)	0.0015 (0.50)	0.0175 (7.17)	0.0131 (7.36)	0.0044 (1.45)
Small-cap	0.0202 (11.71)	0.0168 (12.43)	0.0034 (1.55)	0.0215 (11.90)	0.0166 (12.39)	0.0050 (2.21)
Micro-cap	0.0357 (27.30)	0.0378 (34.38)	-0.0021 (-1.25)	0.0390 (30.76)	0.0357 (31.43)	0.0033 (1.96)

Panel F: CARs for split before and split after groups sorted by book-to-market

	Split before	Do not split before	Difference	Split after	Do not split after	Difference
Book-to-market						
1 (Low)	0.0229 (12.41)	0.0281 (13.55)	-0.0052 (-0.48)	0.0276 (13.26)	0.0242 (13.24)	0.0034 (1.23)
2	0.0258 (17.71)	0.0247 (16.17)	0.0011 (1.06)	0.0273 (15.38)	0.0239 (18.05)	0.0034 (1.54)
3	0.0285 (18.19)	0.0263 (19.40)	0.0022 (0.53)	0.0315 (17.67)	0.0245 (19.64)	0.0070 (3.22)
4 (High)	0.0333 (14.29)	0.0346 (26.08)	-0.0013 (-1.89)	0.0421 (22.73)	0.0295 (20.18)	0.0126 (5.34)

Panel G: CARs for split before and split after groups sorted by past one-year returns

	Split before	Do not split before	Difference	Split after	Do not split after	Difference
Past returns						
1 (Low)	0.0275 (16.26)	0.0302 (21.87)	-0.0026 (-1.21)	0.0363 (19.59)	0.0255 (19.47)	0.0108 (4.75)
2	0.0216 (15.42)	0.0254 (20.69)	-0.0038 (-2.03)	0.0283 (17.36)	0.0215 (19.16)	0.0068 (3.45)
3	0.0255 (15.22)	0.0277 (19.43)	-0.0022 (-0.99)	0.0302 (17.71)	0.0246 (17.50)	0.0055 (2.50)
4 (High)	0.0314 (14.66)	0.0326 (15.76)	-0.0012 (-0.41)	0.0342 (15.45)	0.0307 (15.21)	0.0035 (1.17)

Table 8

Analysts' earnings forecast errors following split announcements.

This table reports analysts' earnings forecast errors for splitting firms and their respective control firms. The forecast error for a firm is the firm's EPS minus the mean of the analysts' forecasts scaled by the firm's stock price in the month prior to the split announcement. The forecast period end date is between six to 18 months following the split announcement. An artificial split announcement date is assigned to the control firms, which has the same number of trading days prior to the earnings announcement date as the split firm. The average forecast errors for the split firms and control firms is reported as well as the difference in these forecast errors. T-statistics are also reported in parentheses below these values. Panel A reports the findings for the full sample whereas panels B and C demarcate firms based on whether they have split before or not (panel B) and whether they have split after or not (panel C). The sample period is 1983-2011.

Panel A: Full sample

	Split firms	Control firms	Difference
1983-1999	-0.00104 (-5.83)	-0.00325 (-11.03)	0.00221 (6.43)
2000-2011	0.00004 (0.18)	-0.00068 (-2.01)	0.00072 (1.82)

Panel B: Split before and do not split before

	Split before	Control firms	Difference	Do not split before	Control firms	Difference
1983-1999	-0.00112 (-4.47)	-0.00327 (-7.03)	0.00216 (4.06)	-0.00098 (-4.01)	-0.00323 (-8.49)	0.00225 (4.99)
2000-2011	-0.00011 (-0.34)	-0.00026 (-0.63)	0.00015 (0.30)	0.00014 (0.51)	-0.00097 (-1.96)	0.00111 (1.96)

Panel C: Split after and do not split after

	Split after	Control firms	Difference	Do not split after	Control firms	Difference
1983-1999	0.00017 (0.78)	-0.00290 (-5.91)	0.00307 (5.64)	-0.00182 (-7.14)	-0.00348 (-9.48)	0.00166 (3.73)
2000-2011	0.00117 (3.14)	-0.00046 (-0.68)	0.00164 (2.12)	-0.00045 (-1.85)	-0.00077 (-2.00)	0.00032 (0.71)

Table 9

Changes in dispersion in analysts' earnings forecasts prior to and following stock split announcements.

This table reports dispersion in analysts' earnings forecasts for splitting firms and their matched control firms in the four quarters prior to and the four quarters after the split announcement. Dispersion in analysts' earnings forecasts is the standard deviation of analysts' earnings forecasts divided by the absolute value of the mean analyst forecast. The difference in dispersion between the split and control firms is also reported. Panel A reports findings for the period 1983-1999 and panel B reports findings for the period 2000-2011.

	Quarters relative to the split announcement							
	-4	-3	-2	-1	1	2	3	4
<i>Panel A: 1983-1999</i>								
Split firms	0.0629	0.0629	0.0601	0.0579	0.0693	0.0643	0.0655	0.0649
Control firms	0.0932	0.0928	0.0913	0.0903	0.0843	0.0961	0.0879	0.0874
Difference	-0.0303	-0.0299	-0.0312	-0.0324	-0.0150	-0.0318	-0.0224	-0.0226
Split before	0.0634	0.0610	0.0585	0.0562	0.0701	0.0626	0.0617	0.0653
Control firms	0.0931	0.0916	0.0937	0.0881	0.0838	0.0907	0.0838	0.0871
Difference	-0.0297	-0.0306	-0.0352	-0.0319	-0.0136	-0.0281	-0.0222	-0.0218
Do not split before	0.0625	0.0642	0.0612	0.0589	0.0686	0.0655	0.0680	0.0645
Control firms	0.0931	0.0930	0.0899	0.0916	0.0845	0.0988	0.0900	0.0875
Difference	-0.0306	-0.0288	-0.0287	-0.0327	-0.0159	-0.0333	-0.0220	-0.0231
Split after	0.0603	0.0632	0.0567	0.0525	0.0694	0.0571	0.0578	0.0583
Control firms	0.0957	0.0922	0.0904	0.0908	0.0760	0.1086	0.0929	0.0876
Difference	-0.0353	-0.0290	-0.0337	-0.0383	-0.0066	-0.0515	-0.0351	-0.0293
Do not split after	0.0643	0.0627	0.0620	0.0607	0.0691	0.0685	0.0700	0.0689
Control firms	0.0917	0.0926	0.0918	0.0900	0.0888	0.0888	0.0849	0.0872
Difference	-0.0274	-0.0299	-0.0298	-0.0292	-0.0196	-0.0203	-0.0148	-0.0183

	Quarters relative to the split announcement							
	-4	-3	-2	-1	1	2	3	4
<i>Panel B: 2000-2011</i>								
Split firms	0.0437	0.0453	0.0445	0.0444	0.0467	0.0485	0.0514	0.0533
Control firms	0.0796	0.0873	0.0781	0.0754	0.0729	0.0748	0.0767	0.0735
Difference	-0.0359	-0.0419	-0.0336	-0.0311	-0.0262	-0.0263	-0.0253	-0.0202
Split before	0.0404	0.0452	0.0420	0.0415	0.0441	0.0509	0.0499	0.0507
Control firms	0.0772	0.0797	0.0762	0.0776	0.0711	0.0742	0.0795	0.0746
Difference	-0.0368	-0.0345	-0.0341	-0.0361	-0.0270	-0.0233	-0.0297	-0.0239
Do not split before	0.0466	0.0455	0.0465	0.0466	0.0487	0.0467	0.0525	0.0552
Control firms	0.0816	0.0932	0.0797	0.0738	0.0742	0.0753	0.0745	0.0726
Difference	-0.0350	-0.0478	-0.0332	-0.0272	-0.0255	-0.0286	-0.0220	-0.0174
Split after	0.0464	0.0466	0.0465	0.0473	0.0460	0.0470	0.0465	0.0504
Control firms	0.0761	0.1120	0.0779	0.0732	0.0715	0.0834	0.0800	0.0715
Difference	-0.0297	-0.0655	-0.0314	-0.0258	-0.0254	-0.0364	-0.0335	-0.0211
Do not split after	0.0426	0.0449	0.0437	0.0431	0.0470	0.0491	0.0536	0.0545
Control firms	0.0809	0.0783	0.0782	0.0763	0.0734	0.0711	0.0753	0.0743
Difference	-0.0383	-0.0334	-0.0345	-0.0332	-0.0265	-0.0220	-0.0217	-0.0197

Table 10

Change in risk for splitting firms.

This table reports the change in various risk measures around stock split announcements. Total volatility is the standard deviation of monthly stock returns. Beta is obtained from a CAPM estimation. IV – Fama-French (IV – Carhart) is the idiosyncratic volatility relative to the Fama-French (1993) (Carhart (1997)) model. The pre-announcement period is [-36, -1] and the post-announcement period is [+1, +36] where month 0 is the announcement month. The percentage difference in the risk measures from the pre announcement to the post announcement periods is also reported. Panel A reports the findings for the full sample whereas panels B and C demarcate firms based on whether they have split before or not (panel B) and whether they have split after or not (panel C). The sample period is 1975-2011.

<i>Panel A: Full sample</i>						
	Pre announce	Post announce	% difference			
Total volatility	0.1240	0.1277	3.01			
Beta	1.1409	1.1971	4.92			
IV – Fama-French	0.1073	0.1104	2.88			
IV – Carhart	0.1062	0.1095	3.14			

<i>Panel B:</i>						
	<i>Split before</i>			<i>Do not split before</i>		
	Pre announce	Post announce	% difference	Pre announce	Post announce	% difference
Total volatility	0.1268	0.1276	0.65	0.1222	0.1278	4.58
Beta	1.2219	1.2479	2.13	1.0891	1.1646	6.93
IV – Fama-French	0.1092	0.1085	-0.72	0.1061	0.1117	5.27
IV – Carhart	0.1082	0.1076	-0.56	0.1049	0.1107	5.59

<i>Panel C:</i>						
	<i>Split after</i>			<i>Do not split after</i>		
	Pre announce	Post announce	% difference	Pre announce	Post announce	% difference
Total volatility	0.1264	0.1271	0.51	0.1225	0.1281	4.57
Beta	1.1666	1.3042	11.80	1.1255	1.1325	0.62
IV – Fama-French	0.1095	0.1082	-1.19	0.1060	0.1118	5.43
IV – Carhart	0.1086	0.1076	-0.95	0.1047	0.1107	5.71

Table 11

Change in liquidity for splitting firms.

This table reports the change in liquidity for splitting firms. Liquidity is proxied using the Liu (2006) and Amihud (2002) illiquidity measures. Liquidity is measured in the year prior to the split announcement and the year following the implementation of the split. The difference in these pre and post values and the associated t-statistic (in parentheses) is also reported. Panel A reports the findings for the full sample whereas panels B and C demarcate firms based on whether they have split before or not (panel B) and whether they have split after or not (panel C). The sample period is 1975-2011.

<i>Panel A: Full sample</i>						
	Pre announce	Post split	Difference			
Liu	13.21	8.34	-4.86 (-11.77)			
Amihud	0.00091	0.00128	0.00037 (1.40)			
<i>Panel B:</i>						
	<i>Split before</i>			<i>Do not split before</i>		
	Pre announce	Post split	Difference	Pre announce	Post split	Difference
Liu	9.53	6.32	-3.20 (-8.17)	15.57	9.65	-5.92 (-14.57)
Amihud	0.00078	0.00156	0.00077 (1.72)	0.00099	0.00110	0.00011 (1.06)
<i>Panel C:</i>						
	<i>Split after</i>			<i>Do not split after</i>		
	Pre announce	Post split	Difference	Pre announce	Post split	Difference
Liu	14.21	8.59	-5.61 (-11.28)	12.65	8.20	-4.44 (-12.33)
Amihud	0.00097	0.00132	0.00035 (1.04)	0.00087	0.00126	0.00038 (1.72)