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Abstract

This paper investigates abnormal standardized returns (ASRs) after major corporate events. Dutta, Knif, Kolari, and Pynnonen (2018) have shown that the ASR t-test has superior size and power compared to traditional test statistics. Based on this new test statistic compared to traditional test methods, we re-examine long-run abnormal returns after mergers and acquisitions, initial public offerings, seasoned equity offerings, dividend initiations, stock repurchases, stock splits, and reverse stock splits. While some recent studies report disappearing long-run event effects over time, our ASR tests in different subperiods from 1980 to 2015 detect significant long-run abnormal returns after these corporate actions. Graphical analyses of ASRs further support our statistical test results. We conclude that long-run abnormal returns persist after major corporate events.

JEL classification:
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Abnormal return, dividend initiation, initial public offering (IPO), long-run event study, merger and acquisition, seasoned equity offering (SEO), share repurchase, stock splits

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1 Introduction

In this study we extend studies on new methodologies for testing long-run abnormal returns by providing evidence based on a robust and powerful abnormal standardized return (ASR) test recently proposed by Dutta, Knif, Kolari, and Pynnonen (2018). Extensive simulation analyses by the authors demonstrate that standardized tests for abnormal returns take into account cross-sectional correlation, autocorrelation, and heteroskedasticity of stock returns, thereby robustifying the test outcomes against these common symptoms that potentially contaminate traditional tests. Furthermore, because they are standardized returns (i.e., returns divided by their standard deviation) weighted by their statistical precision, superior size and power of test statistics are gained, which is well documented in short and long-run event studies (e.g., see Patell (1976), Boehmer, Musumeci, and Poulsen (1991), and Kolari and Pynnonen (2010)). The authors also find that ASRs are less sensitive to outliers than exisiting test methods. Particularly relevant to the problem of testing long-run abnormal returns, because ASRs scale abnormal returns by their standard deviation, ASRs are adjusted for their total risk. Total risk adjustment of abnormal returns is crucial in long-run event studies due to the fact that event firms' exposures to underlying risk factors no doubt change in response to major corporate actions.

Previous studies discussed in the next section employ matched control samples, asset pricing factors, and firm characteristics in efforts to adjust for risk. However, no previous studies adjust for total risk, which encompasses both systematic and unsystematic (firm-specific) risks associated with abnormal returns. Applying the ASR statistic, we empirically test the hypothesis that long-run abnormal returns are associated with corporate events. In the sample period 1980 to 2015, analyses are conducted with respect to major corporate events, including M&As, IPOs, SEOs, dividend initiations, stock repurchases, stock splits, and reverse stock splits. For comparison purposes, traditional buy-and-hold abnormal return (BHAR) and calendar time abnormal return (CTAR)

tests for long-run abnormal returns are performed. Also, tests before and after the early 2000s are conducted.

Summarizing our findings, significant long-run abnormal returns exist both before and after the early 2000s for all corporate actions. In general, our ASR tests tend to detect significant abnormal returns with more frequency and at higher levels of significance that traditional BHAR and CTAR tests. Also, graphical analyses of ASRs clearly document abnormal temporal patterns in long-run returns associated with different corporate events. Based on these findings, we conclude that anomalous long-run abnormal returns persist after major corporate events.

The next section discusses related literature, Section 3 reviews our data and methods, Section 4 reports the empirical results. Section 5 concludes.

2 Related literature

Early evidence on the controversial question of long-run abnormal returns after major corporate events is mixed. Many empirical studies report significant positive or negative long-run abnormal returns associated with (for example) initial public offerings (IPOs), seasoned equity offerings (SEOs), mergers and acquisitions (M&As), dividend initiations, stock splits, earnings surprises, capital investments, and analyst forecasts.[1] However, other studies do not support these findings.[2] According to Nobel Laureate Eugene Fama (1998), abnormal returns related to corporate events should be arbitraged away by investors in an efficient market. Alternatively, behavioral theories[3] posit that psychological responses of investors such as overreaction can give rise to persistent ab-

[1]See Asquith (1983), Agrawal, Jaffe, and Mandelker (1992), Loughran and Ritter (1995), Michaely, Thaler, and Womack (1995)), Spiess and Affleck-Graves (1995), Chan, Jegadeesh and Lakonishok (1996), Brav, Geczy, and Gompers (2000), Eckbo and Norli (2000), Mitchell and Stafford (2000), Titman, Wei, and Xie (2004), Lyandres, Sun, and Zhang (2008), Yook (2010), Billett, Flannery, and Garfinkel (2011), How, Ngo, and Verhoeven (2011), among others.

[2]For example, see Brav and Gompers (1997), Loughran and Vijh (1997), Brav (2000), Eckbo, Masulis, and Norli (2000), Boehme and Sorescu (2002), Gompers and Lerner (2003), among others.

[3]For example, see Kahneman and Tversky (1982), DeBondt and Thaler (1985), Barberis, Shleifer, and Vishny (1998), Daniel, Hirshleifer, and Subramanyam (1998), among others

normal returns.

Recent studies seek to explain anomalous long-run abnormal returns by: (1) examining the stability of relationships over time, and (2) introducing new test methodologies. Regarding the stability of results, Lee, Strong, and Zhu (2014) find disappearing return anomalies in response to a wave of financial market regulations in the early 2000s. They contend that new regulations improved market transparency through corporate information disclosure as well as brokerage firm and analyst' rules.[4] Comparing pre- and post-regulation periods, short-term stock price continuation significantly decreased after analysts forecast revisions and earnings announcements. Similarly, Fu and Huang (2016) find that long-run abnormal returns after corporate stock repurchases and SEOs are significantly positive and negative, respectively, using samples before 2003 but disappear thereafter. They attribute the disappearance of abnormal returns to changing external market and internal firm factors due to regulatory reforms in the early 2000s. Also, they cite a number of studies, including Schwert (2003), Chordia, Subrahmanyam, and Tong (2014), and McLean and Pontiff (2016), that find cross-sectional return anomalies tend to dissipate after their publication in academic literature. Consistent with these studies, Caton, Goh, Lee, and Lin (2016) analyze share repurchase announcements with quarterly data and find a positive link between governance and abnormal stock returns in the subperiod 1991 to 2000 but not 2001 to 2011. Conversely, Evgeniou, de Fortuny, Nassuphis, and Vermaelen (2018) find that the share repurchase anomaly is statistically and economically significant regardless of the subperiods used to examine abnormal returns. Also, Huang and Ritter (2018) examine post-issuance stock performance of firms with large issues of equity and debt. Using calendar-time regressions, underperformance in subsequent years holds in different subperiods for the most part.

With respect to new test methodologies, Malmendier, Moretti, and Peters (2018)

[4]Prominent regulatory initiatives include the Regulation Fair Disclosure in October 2000, NASD Rule 2711 and amended NYSE Rule 472 in May 2002, Sarbanes-Oxley Act (SOX) in July 2002, Global Research Analyst Settlement in December 2002, and Regulation Analyst Certification in April 2003.

employ a novel test of long-run returns after mergers. Using data from close bidding contests, they compare losers' post-merger performance to winners' counterfactual performance had they not won the contest. While winner and loser returns comove prior to contests, they diverge thereafter with winners underperforming losers by 24 percent over three years for U.S. stocks and 14 percent for international stocks. Contrary to these findings, they find that common event study tests of announcement effects did not detect acquirer underperformance. Another study by Bessembinder and Zhang (2013) argues that long-run event studies do not adequately control for differences in firm characteristics between event firms and control firms. They regress differences in the stock returns of event stocks and matched control stocks on a variety of firm characteristics and market risk factors and test the resultant intercepts for abnormal returns. Unconventionally, independent variables are normalized with percentile ranks. Based on tests of IPOs, SEOs, M&As, and dividend initiations, no long-run abnormal returns are found. However, Kolari, Pynnonen, and Tuncez (2019) contest their variable normalization procedure, which introduces extra nonlinearities, causes unpredictable alpha, and inflates standard errors, thereby promoting insignificant results. Using raw values of variables in their regression approach, abnormal returns instead become significant after major events

A related paper by Bessembinder, Cooper, and Zhang (2019) finds that abnormal returns in the three months after a variety of corporate events are eliminated or considerably mitigated after adjusting for 14 firm characteristics adapted from Lewellen (2015). They find that firm characteristics better explain post-event returns than four- and five-factor models. One-month lagged characteristics are used to predict returns for all common stocks from month to month over time. They then cross-sectionally regress realized minus predicted returns on dummy variables for whether or not a firm had a corporate action within the past 36 months. Regarding SEO, IPO, and stock repurchases, whereas Lewellen (2015) finds that the past 36 months (log) growth in (split-adjusted)

shares outstanding is a highly significant predictor of future returns with negative coefficient, Bessembinder et al. find insignificant results based on their two-step approach (i.e., share growth is excluded from the model and then included as a dummy variable in their prediction error regressions). However, unlike the present study, because their tests focus on a narrow three-month post-event window, no long-run abnormal return evidence is provided. Additionally, rather than use firm characteristics to adjust for risk, we use the standard deviation of abnormal returns to adjust for total risk.

3 Data and methods

In this section, we describe sample selection, define abnormal return metrics, and specify alternative test statistics.

3.1 Sample selection

A number of different samples of event stocks and matched controls are gathered around different corporate events, including mergers and acquisitions, initial public offerings, dividend initiations, share repurchases, stock splits, and reverse splits. The mergers and acquisitions (M&A) sample consists of completed M&A's in the Thomson ONE (SDC) U.S. database between 1980 and 2015 with transaction value of $5 million or more.[5] Following Betton, Eckbo, and Thornburn (2008), two filters are applied: (1) the acquisition takes the form of a merger (M), majority interest (AM), remaining interest (AR), or partial interest (AP); and (2) the acquisition is a control bid wherein the acquirer owns the majority (at least 50%) of the target after the deal. To eliminate small deals, the relative size of the deal must be greater than 5%. We have 5,592 acquisitions in the M&A sample.

[5]There are a few SDC observations from 1980 to 1985 in the M&A sample. As Barnes, Harp, and Oler (2014) point out, for M&A activity from 1984 and onward, SDC is probably the best database while there could be some errors and limited coverage in the early 1980s.

We select a control firm for each acquirer firm by matching size and book-to-market ratio (BM) characteristics on CRSP and Compustat. Firm size (market capitalization) is calculated at the end of December prior to the M&A deal announcement date. Like Fama and French (1993), book equity is defined as the Compustat book value of stockholders equity, plus balance sheet deferred taxes and investment tax credits (if available), minus the book value of preferred stock. Depending on availability, the redemption, liquidation, or par value (in that order) is used to estimate the value of preferred stock. The BM ratio is computed at year-end $t-1$. Following Eckbo, Masulis, and Norli (2007) and Bessembinder and Zhang (2013), for each M&A event, matched firms have closest BM among firms with market capitalization between 70% and 130% of the acquirer firm. We eliminate matching firms that are in the sample of acquirers within ten years around the event date.

The SEO sample consists of completed U.S. SEOs in the Thomson ONE (SDC) database between 1980 and 2015, excluding Global Depository Receipts, American Depository Receipts and unit offerings. Utility and financial firms are excluded also. The procedure for selecting matching firms is similar to the M&A sample. There are 7,327 SEO events.

The initial public offering (IPO) sample includes all completed U.S. IPOs in the Thomson ONE (SDC) database between 1980 and 2015, excluding American Depository Receipts, Real Estate Investment Trusts, closed-end funds, unit trust offerings and units. We select matching firms among the firms having CRSP data using firm size. Following Loughran and Ritter (2000), for each IPO, the matched firm has the closest but greater market capitalization at the end of December following the IPO date. Matching companies must have been publicly traded for more than 5 years. There are 8,347 IPO events.

The dividend initiations (DIV) sample includes cash dividend initiations between 1980 and 2015. Following Boehme and Sorescu (2002), we apply the criteria that com-

mon stocks are listed on the NYSE, NASDAQ, or NYSE MKT (AMEX), stocks have been included in the CRSP for more than two years, dividends are ordinary cash (USD), and they are paid regularly (as reported by CRSP)[6]. We apply the same matching steps as for M&A and SEO samples. There are 1,288 dividend initiations.

The share repurchase (REP) sample includes share repurchase announcements for U.S common stocks in the Thomson ONE (SDC) database between 1980 and 2015. In the case of multiple announcements within a year, we only keep the first one in our sample. In this regard, we should mention that Yook (2010) shows that abnormal returns are higher among infrequent repurchasers compared to frequent repurchasers. Our sampling approach mitigates the effects of frequent repurchases to some extent. Again, we apply the same matching steps as for M&A and SEO samples. There are 16,391 share repurchase announcements.

Stock split and reverse splits are from CRSP database between 1980 and 2015 with distribution codes 5,523 and 5,533 (ordinary stock splits and large stock dividends, respectively). For both events, we apply the filters that U.S. common stocks (CRSP share codes 10 and 11) are listed on the NYSE, NASDAQ, or NYSE MKT (AMEX). Firms with negative book-to-market ratios are excluded from the sample. In the case of multiple events within a year, we only keep the first event for the firm.

Following Boehme and Danielsen (2007), we apply the criteria that stock splits must be two-for-one or greater, split announcements must appear in CRSP, stocks must have at least 24 months data before the split announcement date, and share price must be at least $2.00 per share after the split. As in their study, we investigate stock split events on both announcement and effective dates (denoted SPLTA and SPLT, respectively). In total, we have 4,599 stock-split announcements and 4,602 stock split events between 1980 and 2015. With respect to reverse split events (RSPLT), following Kim, Klein, and Rosenfeld (2008), we exclude reverse splits less than 1:2 (one-for-two splits). In our

[6]In the CRSP database, the frequency of dividends is monthly, quarterly, semiannual, annual, or unspecified. As noted by Boehme and Sorescu (2002), unspecified frequencies are mostly quarterly.

data, we have 1,668 reverse stock-split events.[7] For matching firms, we apply the same matching steps as for M&A and SEO samples. For both events, we eliminate matching firms that are in the sample of split or reverse stock splits within ten years around the event date.

Table 1 shows the number of corporate events in different years. With the exception of dividend initiation (DIV) events, M&A, SEO, IPO, REP, SPLTA, SPLT and RSPLT events peak during the mid-to-late 1990s.

3.2 Abnormal return metrics

Contributing to previous literature, we employ a new metric for abnormal returns proposed by Dutta, Knif, Kolari, and Pynnonen (2018). The authors define abnormal standardized returns (ASRs) as:

$$\texttt{ASR}_{it} = \texttt{sr}_{it} - \texttt{sr}^{c}_{it}, \tag{1}$$

where $\texttt{sr}_{it} = \log(1 + R_{it})/s_i$ and $\texttt{sr}^{c}_{it} = \log(1 + R^{c}_{it})/s^{c}_{i}$ are standardized log returns of the event stock and its control stock, and s_i and s^{c}_{i} are the standard deviations of the respective log returns. It is notable that returns are not homogeneous due to varying volatility across stocks. Scaling returns by their standard deviation adjusts the return by its measurement precision, thereby giving more weight on less volatile (more reliable) observations and less weight on more volatile (less reliable) observations. Regarding the latter observations, more volatile returns are noisier and therefore less informative in revealing the mean event effect. This standardization is a key feature of boosting the statistical power of the approach. Weighting for statistical precision is considered to be an attractive feature in testing abnormal returns (see Fama (1998, p. 269)). According to Dutta et al., ASRs are much less sensitive to outliers than other test methods, especially

[7] Unlike split events, declaration dates (announcement dates) for reverse stock split events are not available for many companies in the CRSP database.

BHAR tests.

As recognized by many authors, risk adjustment is particularly important to the measurement of abnormal returns in long-run event studies. For example, Eckbo, Masulis, and Norli (2000) find that the risk of SEO stocks decreases on average during the post-issue period (see also Huang, Ho, Lin, and Yen (2014)). In turn, they argue that investors require lower expected returns, such that the (non-adjusted) matched-firm technique by itself generates abnormal performance. Relatedly, Carlson Fisher and Giammarino (2006) use a real options framework to show that expected returns for SEOs decrease due to lower risk from converting growth options into new assets. Their analyses indicate that, even after adjusting for size and book-to-market effects, standard matching methods in long-run event studies do not capture this risk shift. Applying q-theory to explain external financing anomalies, Li, Livdan, and Zhang (2009) show that systemic risk is determined by corporate actions affecting the firm's capital stock, investment, fixed costs of production, fixed and variable financing costs, and production function. More generally, Kothari and Warner (2006, p. 21) argue that, unlike short-run event studies, appropriate risk adjustment is critical in long-run event tests to avoid spurious abnormal return behavior.

Similar to the Sharpe ratio, which makes different returns comparable by scaling in terms of their standard deviations, ASR adjusts the returns of event and control stock returns by scaling based on their respective standard deviations.[8] By averaging ASRs for a large sample of event and control stocks, potential pitfalls in applying Sharpe ratio type measures[9] are mitigated due to the Central Limit Theorem (e.g., nonnormality of

[8]As pointed out by an anonymous referee, the Sharpe ratio utilizes excess returns over an assumed constant riskless rate. In the similar but somewhat different case of ASRs, we essentially have the difference in two Sharpe ratios wherein the constant riskless rate is dropped, which would not affect the standard deviations in their denominators.

[9]Regarding Sharpe ratios, Jobson and Korkie (1981) found in simulation experiments that the frequency distribution of Sharpe ratios exhibited skewness, a higher mean, and a higher variance than the theoretical distribution. However, as the sample size increases (e.g., 60 observations), their distribution approached the theoretical distribution. Confirming this result, Lo (2002) showed that the Sharpe ratio is asymptotically normal for large sample sizes. See Ledoit and Wolf (2008) and Pav (2014) for further discussion on the asymptotic properties of Sharpe ratios and statistical tests.

returns for individual stocks, cross-sectional correlation over the same calendar days, and serial correlation in returns over time due to clustering robust standard errors discussed shortly). Since ASRs adjust for total risk comprised of both systematic and unsystematic (idiosyncratic) risks, they provide a simple abnormal return metric that encompasses a wide variety of different risks affecting sample stocks.

In forthcoming empirical tests, for comparative purposes, we estimate traditional buy-and-hold abnormal returns (BHARs) and calendar time abnormal returns (CTARs) also. BHARs (Lyon, Barber, and Tsai, 1999) over holding period $(1, h)$ are defined as:

$$\texttt{BHAR}_i(h) = \prod_{t=1}^{h}(1 + R_{it}) - \prod_{t=1}^{h}(1 + R^c_{it}), \tag{2}$$

where R_{it} and R^c_{it} are returns on the test asset and its matching control firm, respectively. Following Boehme and Sorescu (2002), CTARs are estimated using an adjusted Fama and French (1993) three-factor model in which the return difference between an event stock and its size/book-to-market matched control stock is regressed on well-known size and book-to-market factors:

$$(R_{\texttt{event}} - R_{\texttt{control}})_{pt} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + e_{pt}, \tag{3}$$

where α_p defines the abnormal return denoted CTAR(control), $(R_{\texttt{event}} - R_{\texttt{control}})_{pt}$ is the monthly portfolio return difference (equal- or value-weighted) between the simple returns of each event stock and its matched control stock, R_{mt} is the monthly return on the value-weighted market index, R_{ft} is the monthly return on one-month Treasury bills, *SMB* is the monthly Fama-French small-minus-big size factor return, and *HML* is the monthly Fama-French high-minus-low BM factor return.[10] In month t the portfolio return $(R_{\texttt{event}} - R_{\texttt{control}})_{pt}$ includes all stocks whose event period includes the month. Thus, the number of stocks, n_t, can vary monthly from zero to the total number of

[10]Data for the Fama-French factors are downloaded from Kenneth French's online data library.

sample stocks. The month index t runs from the earliest to the latest month among the event periods of the sample stocks, and months with $n_t = 0$ are discarded from the analysis. For completeness, we also compute abnormal return α_p in terms of the original Fama-French three-factor model:

$$(R_{\texttt{event}} - R_f)_{pt} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + e_{pt}, \tag{4}$$

where α_p defines the abnormal return $(R_{\texttt{event}} - R_f)$ denoted CTAR(R_f).

Responding to anonymous referees, we repeat the above CTAR tests using the Fama and French (2015) five-factor model. This model augments the three-factor model with the following two factors: RMW is the robust profit minus weak profit factor, and CMA is the conservative minus aggressive capital investment factor. These zero-investment portfolios further risk adjust abnormal returns for profit and capital investment firm characteristics.

In sum, an important advantage of ASR in equation (1) is total risk adjustment of abnormal returns that not only uses the control samples to adjust for risk but also scaling by the standard deviation of returns. By contrast, BHAR and CTAR rely upon control samples for risk adjustment, which likely has limited scope in view of previous studies cited above on anomalies and firm characteristics.

3.3 Test statistics

Abnormal standardized returns (ASRs) for the holding period from h_1 to h_2 with $1 \leq h_1 \leq h_2 \leq h$ are tested by means of ASR t-statistics defined by Dutta, Knif, Kolari, and Pynnonen (2018) as

$$t_{\texttt{asr}}(h_1, h_2) = \frac{\overline{\texttt{ASR}}(h_1, h_2)}{\text{s.e}(\overline{\texttt{ASR}})}, \tag{5}$$

where

$$\overline{\texttt{ASR}}(h_1, h_2) = \frac{1}{n(h_2 - h_1 + 1)} \sum_{i=1}^{n} \sum_{t=h_1}^{h_2} \texttt{ASR}_{it} \tag{6}$$

is the holding period average $\texttt{ASR}_{it}$ per month over the n event firms. Standard error s.e(ASR) is estimated utilizing the clustering robust approach (e.g., see Cameron, Gelbach, and Miller, 2011).[11]

Turning to traditional event study tests, the t-ratio for testing BHAR, or BHAR-T, is defined as

$$t_{\texttt{bhar}} = \frac{\overline{\texttt{BHAR}}(h)\sqrt{n}}{\text{s.e}(\overline{\texttt{BHAR}})}, \tag{7}$$

where

$$\overline{\texttt{BHAR}}(h) = \frac{1}{n} \sum_{i=1}^{n} \texttt{BHAR}_i(h) \tag{8}$$

is the mean of $\texttt{BHAR}_i(h)$s and

$$\text{s.e}(\overline{\texttt{BHAR}}) = \sqrt{\frac{1}{n(n-1)} \sum_{i=1}^{n} (\texttt{BHAR}_i(h) - \overline{\texttt{BHAR}}(h))^2} \tag{9}$$

is the standard error of $\overline{\texttt{BHAR}}(h)$s.[12] Also, calendar time abnormal return (CTAR) α_ps in equations (3) and (4) are tested via the estimated regression t-ratio of the intercept coefficient.

[11] Clustering robust standard errors are available in modern statistical packages such as SAS and Stata. One can easily utilize these packages by arranging $\texttt{ASR}_{it}$ observations in the holding periods from h_1 to h_2 into a pooled panel data set. Clustering robust standard errors and associated t-statistics are computed by estimating the regression $\texttt{ASR}_{it} = \alpha + u_{it}$, i.e., a regression on the constant term using the clustering standard error option of the package. The OLS-estimate $\hat{\alpha}$ equals $\overline{\texttt{ASR}}(h_1, h_2)$, and the cluster robust standard error of $\hat{\alpha}$ gives s.e(ASR) in equation (5) to account for cross-sectional correlation due to overlapping event months.

[12] There is a skewness adjusted version of $t_{\texttt{bhar}}$ by Lyon et al. (1999) that aims to correct for the observed skewness. However, this problem arises only when a reference portfolio (as opposed to reference stock) is used (see Barber and Lyon (1997, Sec 2.2)). Because we use reference stocks, this issue is not relevant to our tests.

4 Empirical results

Tables 2 to 9 give the results for M&A, IPO, SEO, dividend initiation (DIV), stock repurchase (REP), stock split announcements (SPLTA), stock splits (SPLT) and reverse stock split (RSPLT) corporate events, respectively. Sample sizes after trimming (based on BHAR distributions) are reported in the tables. Analyses are provided for events that occurred in the full sample period 1980–2015 as well as subperiods 1980–2002 and 2003–2015. We also include the subperiod 2003 to 2012 in which Fu and Huang (2016) report insignificant abnormal returns associated with SEO and stock repurchase events. Forthcoming discussion of results emphasizes ASR tests with comparative analyses of traditional BHAR and CTAR results.

4.1 Mergers and Acquisitions (M&As)

Table 2 summarizes the M&A event study results. Panel A has the full sample results in the period 1980–2015. Significant positive abnormal returns are detected by all test metrics in the M&A month. ASR test results in the first few rows indicate that these positive abnormal returns continue in the next two months but other test metrics are insignificant. In years 2 and 3 after M&As, long-run negative abnormal returns are generally significant for BHAR and CTAR methods but not ASR tests. In year 5 only the CTAR(control) statistic is significant (at the one percent level) for both the Fama and French three- and five-factor models. The insignificance of ASR tests in years 2, 3, and 5 suggests that standardizing abnormal returns can substantially change the long-run test results.

In subperiod 1980–2002 results in Panel B, abnormal return tests are similar to those for the full sample period in Panel A, with the exception that magnitudes of long-run abnormal returns for M&As are less negative than before. CTAR tests for the three-factor model remain significantly negative in years 2 to 5 but not the five-factor model,

and BHARs are no longer significant. ASR tests are again insignificant in years 2 to 5.

Turning to Panels C and D, the long-run results in the post-2002 subperiod are not consistent with some authors' conjecture that anomalous abnormal returns disappear for the most part. In Panel C subperiod 2003-2012 results, we see that not only are BHAR and CTAR(control) tests significant in years 2, 3, and 5 but now ASR t-values are significant too. The results in subperiod 2003-2015 in Panel D are similar to those in Panel A, albeit with somewhat weaker negative long-run abnormal returns. In general, long-run negative abnormal returns are detected after M&As by both traditional and new ASR test metrics in the post-regulation subperiods after 2002. We infer that shareholders do not tend to benefit in the long run from M&A activity, perhaps due to agency costs associated with managerial motivations.

4.2 Initial Public Offerings (IPOs)

The IPO results are reported in Table 3. Abnormal returns in the IPO month are not available (NA) for most firms. In Panel A's full sample period results, we see that IPOs experience negative returns in the issue month, positive returns in post-event months 1 and 2 but not significant ASRs or five-factor CTARs (r_f), and then long-run negative returns in years 1 to 5. All test metrics are significant in years 2, 3, and 5, with the exception of five-factor CTARs. ASRs are significantly negative on a consistent basis from 6 months to 5 years. The results in Panel B for subperiod 1980–2002 are similar to those for the full sample period in Panel A. Interestingly, ASR t-values exceed 4 in years 1 to 5 in both Panels A and B, which suggests that anomalous negative long-run abnormal returns are quite large in magnitude for IPOs.

Post-regulation subperiod results in Panels C and D indicate that long-run abnormal returns are less negative than in the pre-regulation subperiod.[13] Even so, in both subperiods 2003–2012 and 2003–2015, negative ASRs are significant (at the 10 percent

[13]Carter, Dark, Floros, and Sapp (2011) find that the underperformance of IPOs faded over the time period of 1998-2005

level) in year 5. Like M&As, our results suggest that negative abnormal returns persist after 2002. While shareholders do not appear to benefit from IPOs in the long run, it is possible that empire-building managers reap rewards.

4.3 Seasoned Equity Offerings (SEOs)

SEO findings are shown in Table 4. Similar to IPOs, for the full sample period in Panel A, a reversal occurs from positive abnormal returns in months 1 and 2 to negative returns in years 1 to 5. All test metrics indicate significant negative returns in the long run. In Panel B, similar abnormal return patterns are evident in the subperiod 1980–2002.

In Panel C subperiod 2003–2012 results, again similar to IPOs, long-run abnormal returns do not disappear. Both ASR and CTAR tests indicate that abnormal returns persist 2, 3, and 5 years after events. Also, Panel D results in subperiod 2003–2015 are more strongly negative than the 2003–2012 subperiod. All test metrics find negative and significant abnormal returns in this post-regulation subperiod. ASR t-values are highly significant at the 1 percent level in years 3 and 5 in Panels C and D, whereas BHAR and CTAR tests are less (or not) significant in these years.

4.4 Dividend Initiations (DIVs)

Our dividend initiation (DIV) findings are provided in Table 5. For full sample results in Panel A, all test metrics show highly significant positive abnormal returns in the initiation month that continue into months 1, 2 and 6. In contrast to M&As, IPOs, and SEOs, positive abnormal returns persist from 1 to 3 years after this corporate event. Note that ASR tests are highly significant at the 1 percent level from the initiation month to 3 years after the event. No abnormal returns are detected in year 5. Similar results are obtained in Panel B's subperiod 1980–2002, except that the BHAR test is now marginally significant (at the 10 percent level) in year 5, and the ASR test is somewhat less significant in some event periods.

In the post-regulation subperiod results in Panels C and D, positive abnormal returns persist for 1 to 6 months after dividend initiations. Thereafter evidence of positive and significant abnormal returns exists also – namely, significant ASRs in post-event years 1, 2, and 3 as well as significant CTAR(r_f) test statistics in years 1 and 2. BHAR tests are not significant in these years. Also, we should note that ASR tests detect more significant abnormal returns in years 2 and 3 than the other tests, a result attributable to the higher power of the ASR test compared to the others (see Dutta et al. (2018)). These findings suggest that the significance of positive long-run abnormal returns persists after 2002. Apparently, dividend initiations are positive signals of higher expected cash flows that tend to increase future share prices.

4.5 Stock Repurchases (REPs)

Table 6 contains stock repurchase results. In the full sample period results in Panel A and pre-regulation subperiod in Panel B, the patterns of abnormal returns are similar to those for dividend initiations. Significant positive abnormal returns are present in the repurchase month and all post-event windows from months 1 to 6 through years 1 to 5. Fu and Huang (2016) also report highly significant 3-year abnormal returns for stock repurchases.

In the post-regulation subperiods in Panels C and D, long-run positive abnormal returns continue to exist. The t-values for ASR tests remain highly significant at the one percent level in years 1, 2, 3, and 5. BHAR test results are likewise highly significant in these years, but CTAR tests indicate somewhat lower significance. By casual observation, the magnitudes of abnormal returns in Panels C and D are somewhat less than those in Panel B but nonetheless highly statistically significant. Again, abnormal returns do not disappear after 2002, which suggests that stock repurchases signal higher future cash flows and share prices.

4.6 Stock Splits (SPLTA and SPLT)

Table 7 reports abnormal returns for stock split announcement events (SPLTA), and Table 8 reports numbers for stock split effective date events (SPLT).

For full sample results in Panel A of Table 7, all test metrics show positive abnormal returns for SPLTAs. BHAR and CTAR (ctrl) results are significant for all periods, and ASR results are significant from 6 months to 5 years. The 1980–2002 subperiod results in Panel B are similar to the full sample results. In the post-regulation subperiod results in Panels C and D, positive abnormal returns persist for most cases, albeit not significant with the exception of 2 year abnormal returns for all but ASR tests.

Results in Table 8 for SPLTs are similar to Table 7. ASR, BHAR, and CTAR test results show positive and significant abnormal returns in most cases for stock split events in Panels A and B. In the post-regulation subperiod results in Panels C and D, positive abnormal returns persist for most cases, albeit not significant except for BHAR and CTAR tests from 6 months to 2 years. These significant results appear to be driven for the most part by a few aberrant cases. As a robustness check, we removed in Panels E and F of Table 7 about 1 percent, i.e., 7 event firms, with most extreme monthly returns during the first 12 months after the event month. Removing these 7 cases largely rendered the original significant results for BHAR and CTAR tests to be insignificant. However, the ASR statistic was robust to dropping these cases, which is consistent with evidence in Dutta et al. (2018, Appendix B).

Despite weakening of stock split effects in the post-2002 subperiods, our full sample findings sugggest that stock splits can convey positive information about the future prospects of the firm. If investors view a split as a sign of confidence in the future, increasing demand for shares by investors can drive share prices higher.

4.7 Reverse Stock Splits (RSPLT)

Lastly, Table 9 includes reverse stock split events (RSPLT). For full sample results in Panel A, all test metrics show negative and significant abnormal returns for reverse stock split events (except BHARs and five-factor CTARs(r_f) over 2, 3, and 5 years). In 1980–2002 subperiod results in Panel B, we find negative and significant ASR results for all post-event cases, and BHAR and CTAR results are negative and significant for 1 month, 2 months, and 6 months. The post-regulation subperiod results in Panels C and D show that negative and significant abnormal returns persist for reverse stock splits after 2002. It appears that reverse splits are perceived as a negative action associated with decreasing share prices.

4.8 Graphical Analyses

In this section, we provide graphical evidence of abnormal standardized returns (ASRs). These pictures document post-event stock performance after major corporate events for ease of interpretation. Figure 1 reports ASRs for different corporate events for the full sample period 1980 to 2015. Negative patterns for IPO and SEO events in Panels B and C are prominent with few positive abnormal returns from 0 to 60 months after events. For M&A events in Panel A and dividend initiation (DIV) events in Panel D, we see mixed positive and negative abnormal returns over time with somewhat stronger negative and positive returns, respectively. Share repurchase (REP) events in Panel E typically have positive abnormal returns over time. Stock split announcements (SPLTAs) and stock split effective dates (SPLTs) in Panel F and G, respectively, show positive abnormal returns over time. Conversely, reverse stock split events (RSPLTs) in Panel H exhibit negative abnormal returns. These graphs clearly demonstrate abnormal return behavior after corporate events.

Figures 2 and 3 show monthly ASRs for the post-regulation subperiods 1980–2002 and 2003–2015, respectively. For M&A events in Panel A of these figures, negative ab-

normal returns over time appear to be stronger in subperiod 2003–2015 than in prior subperiod 1980–2002. Negative abnormal returns for IPO events in Panel B in prior subperiod 1980–2002 are somewhat weaker than in subperiod 2003–2015 but they both are negative on average. Negative abnormal returns for SEO events in Panel C appear to be more persistently negative in later subperiod 2003–2015 than in earlier subperiod 1980–2002. The dividend initiation (DIV) results are somewhat mixed in subperiods before and after 2002, but statistical tests in Table 5 previously indicated significant positive abnormal returns in post-event windows. Stock repurchases (REP) have predominantly positive abnormal returns in subperiods before and after 2002. Split events SPLTA, SPLT, and RSPLT in the last three panels in these figures clearly illustrate abnormal returns, with somewhat lower abnormal returns for SPLTA and SPLT in the subperiod after 2002.

In sum, our graphical analyses reveal that long-run abnormal returns persist before and after the early 2000s.

5 Conclusions

This paper revisited the long-standing debate on long-run abnormal returns associated with major corporate events by applying abnormal standardized return (ASR) tests recently proposed by Dutta, Knif, Kolari, and Pynnonen (2018). Standardized abnormal returns are weighted by their statistical precision and therefore improve the size and power of statistical tests. The authors show that ASR t-values take into account cross-sectional correlation, autocorrelation, and heteroskedasticity of stock returns and reduce outlier issues. Most importantly, ASRs are adjusted for total risk, which is crucial in long-run event studies extending years after corporate events. Without proper risk adjustment, it is not possible to discern between mispricing error and risk explanations of returns. Previous statistical tests of abnormal returns, including widely-used BHAR

and CTAR measures, utilize matching control firms to improve risk adjustment. Unlike these measures, ASRs scale abnormal returns by the standard deviation of returns to adjust for total risk.

We conducted event studies of major corporate events, including M&As, IPOs, SEOs, dividend initiations (DIVs), stock repurchases (REPs), stock splits (SPLTAs and SPLTs), and reverse stock splits (RSPLTs), in the full sample period 1980–2015 as well as subperiods 1980–2002, 2003–2012, and 2003–2015. The post-event period 2003–2015 is particularly interesting due to numerous authors reporting abnormal returns that tend to diminish or disappear over time. Our ASR findings were benchmarked against traditional BHAR and CTAR tests for abnormal returns reported in most long-run event studies.

In general, we found that abnormal returns for corporate actions under study were significant in subperiods before and after 2002. Compared to traditional BHAR and CTAR tests, ASR tests tended to more frequently detect significant abnormal returns in post-event windows extending up to 5 years after corporate events. Also, significance levels associated with ASR tests generally exceeded those of BHAR and CTAR tests. Further graphical analyses of ASRs documented abnormal temporal patterns of long-run returns after different corporate events. We conclude that anomalous long-run abnormal returns persist after major corporate events. By implication, regulatory changes and academic publications since the early 2000s have not enabled investors to arbitrage away long-run abnormal returns.

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Table 1: Number of M&A, SEO, IPO, dividend initiation (DIV), share repurchase (REP), split announcement (SPLTA), split (SPLT), and reverse split (RSPLT) events in different years (1980–2015).

M&A, SEO, IPO, share repurchase (REP) are from Thomson ONE (SDC) database. The M&A sample consists of completed U.S. deals with transaction values of $5 million or more. Acquisitions must take the form of a merger (SDC deal form M), acquisition of majority interest (AM), acquisition of remaining interest (AR), or acquisition of partial interest (AP). The acquisition must be a control bid and the relative size of the deal must be greater than 5%. The IPO sample excludes Real Estate Investment Trusts, closed-end funds, unit trust offerings, units and American Depository Receipts. The SEO sample excludes American Depository Receipts, Global Depository Receipts, unit offerings, and financial and utility firms. The dividend initiation (DIV) sample includes common stocks listed on the NYSE, AMEX, or NASDAQ with CRSP data available for more than two years. Dividend initiations are ordinary cash in dollars that are paid regularly. The share repurchase (REP) sample includes repurchase announcements for U.S common stocks and excludes multiple announcements within a year. Split announcement (SPLTA), split (SPLT), and reverse split (RSPLT) events are from CRSP with distribution codes 5,523 and 5,533.

Year	M&A	SEO	IPO	DIV	REP	SPLTA	SPLT	RSPLT
1980	5	116	93	29	1	189	199	4
1981	10	130	239	24	9	220	216	7
1982	1	149	85	12	23	69	70	13
1983	2	349	529	18	115	349	346	21
1984	27	96	230	25	376	130	130	16
1985	98	136	241	21	68	155	155	27
1986	110	201	504	25	65	277	275	18
1987	120	152	353	27	99	220	219	38
1988	94	71	140	47	87	57	57	35
1989	107	100	120	47	154	108	108	36
1990	71	98	121	39	669	92	93	64
1991	101	201	283	27	271	92	91	43
1992	141	197	395	29	400	172	171	84
1993	179	254	503	29	388	173	172	68
1994	246	215	393	42	731	140	143	52
1995	312	283	446	56	800	183	183	70
1996	310	332	663	23	988	221	220	56
1997	374	306	445	25	930	232	232	59
1998	371	212	283	13	1,356	228	230	116
1999	295	215	447	26	1,047	181	180	78
2000	297	241	326	13	530	194	194	39
2001	205	235	69	16	521	68	69	86
2002	147	212	63	27	372	87	87	80
2003	175	226	66	115	375	84	84	54
2004	181	292	161	76	447	129	130	30
2005	199	214	148	51	514	148	147	36
2006	192	219	140	44	491	117	117	44
2007	189	217	147	33	736	80	80	25
2008	137	120	20	15	787	28	28	40
2009	100	239	39	21	306	7	7	35
2010	94	184	86	50	424	16	16	60
2011	98	198	74	49	587	40	40	43
2012	117	168	94	60	407	29	29	61
2013	124	212	141	48	378	32	32	49
2014	167	221	168	50	471	35	35	24
2015	196	316	92	36	468	17	17	57
Total	5,592	7,327	8,347	1,288	16,391	4,599	4,602	1,668

Table 2: Tests of merger and acquisition (M&A) abnormal returns

The sample contains M&As from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang (2016), and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Full sample period 1980–2015								
	M&A	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.03***	0.26	0.31**	0.10	0.08	0.01	-0.01	-0.01
t-val	5.62	1.55	2.44	1.25	1.20	0.14	-0.11	-0.27
BHAR(%)	2.93***	0.21	0.52	-0.53	-0.69	-3.56**	-5.30**	-3.90
t-val	8.74	0.74	1.42	-0.70	-0.63	-2.28	-2.54	-0.90
CTAR(ctrl, FF3)(%)	2.91***	0.30	0.27	-0.08	-0.08	-0.19**	-0.20**	-0.19***
t-val	8.61	1.09	1.35	-0.73	-0.77	-2.10	-2.44	-2.76
CTAR(ctrl, FF5)(%)	2.96***	0.36	0.33*	-0.08	-0.06	-0.16**	-0.16**	-0.16**
t-val	9.02	1.30	1.71	-0.63	-0.59	-1.99	-2.07	-2.42
CTAR(r_f, FF3)(%)	2.28***	-0.07	-0.08	-0.22*	-0.20	-0.24**	-0.22*	-0.15
t-val	8.22	-0.32	-0.48	-1.81	-1.57	-2.04	-1.91	-1.46
CTAR(r_f, FF5)(%)	2.33***	-0.03	-0.02	-0.18	-0.12	-0.16	-0.15	-0.10
t-val	8.34	-0.12	-0.09	-1.40	-0.82	-1.18	-1.14	-0.86
Obs (BHAR)	5,408	5,404	5,404	5,404	5,404	5,404	5,404	5,405
Obs (CTAR)	395	395	405	420	426	430	430	430
N of Months	5,378	5,376	10,696	31,276	59,965	109,340	149,496	209,739
N of Clusters	395	395	405	420	426	430	430	430
Panel B: Subperiod 1980–2002								
	M&A	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.02***	0.37*	0.44***	0.22**	0.16**	0.07	0.06	0.05
t-val	4.48	1.76	2.66	2.24	1.97	0.97	0.82	0.80
BHAR(%)	3.38***	0.35	0.91*	0.35	0.46	-2.37	-4.20	-1.81
t-val	7.32	0.90	1.84	0.33	0.30	-1.11	-1.42	-0.28
CTAR(ctrl, FF3)(%)	3.35***	0.39	0.40	0.01	-0.04	-0.20*	-0.20*	-0.18**
t-val	7.07	0.98	1.41	0.05	-0.34	-1.72	-1.83	-2.02
CTAR(ctrl, FF5)(%)	3.49***	0.59	0.54*	0.06	0.01	-0.15	-0.14	-0.15*
t-val	7.50	1.47	1.94	0.35	0.08	-1.32	-1.34	-1.73
CTAR(r_f, FF3)(%)	2.72***	-0.15	-0.24	-0.28	-0.25	-0.33**	-0.28*	-0.19
t-val	6.96	-0.50	-1.07	-1.64	-1.27	-1.98	-1.76	-1.34
CTAR(r_f, FF5)(%)	2.84***	-0.04	-0.11	-0.20	-0.08	-0.17	-0.16	-0.11
t-val	7.18	-0.13	-0.44	-1.01	-0.35	-0.85	-0.82	-0.66
Obs (BHAR)	3,507	3,505	3,505	3,505	3,505	3,505	3,505	3,505
Obs (CTAR)	240	240	251	270	282	298	310	334
N of Months	3,490	3,490	6,950	20,413	39,326	72,360	99,553	141,012
N of Clusters	240	240	251	270	282	298	310	334

Table 2, Continued

Panel C: Subperiod 2003–2012								
	M&A	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.64*	-0.16	-0.13	-0.33**	-0.20*	-0.23***	-0.23***	-0.21***
t-val	1.96	-0.50	-0.62	-2.49	-1.87	-2.87	-3.11	-2.98
BHAR(%)	1.96***	-0.13	-0.42	-3.13**	-3.31*	-8.12***	-10.31***	-10.85***
t-val	3.96	-0.30	-0.67	-2.57	-1.94	-3.22	-3.57	- 2.68
CTAR(ctrl, FF3)(%)	1.83***	-0.05	-0.16	-0.47**	-0.24	-0.25*	-0.29**	-0.28**
t-val	4.37	-0.13	-0.53	-2.31	-1.38	-1.87	-2.35	-2.48
CTAR(ctrl, FF5)(%)	1.84***	-0.06	-0.17	-0.49**	-0.25	-0.26**	-0.29**	-0.27**
t-val	4.37	-0.14	-0.55	-2.37	-1.46	-2.09	-2.42	-2.45
CTAR(r_f, FF3)(%)	1.16***	0.07	0.20	-0.19	-0.17	-0.15	-0.21	-0.18
t-val	3.27	0.26	0.84	-1.22	-1.26	-1.05	-1.39	-1.23
CTAR(r_f, FF5)(%)	1.13***	0.06	0.19	-0.21	-0.18	-0.17	-0.21	-0.18
t-val	3.23	0.22	0.77	-1.26	-1.35	-1.13	-1.39	-1.12
Obs (BHAR)	1,440	1,438	1,438	1,438	1,438	1,438	1,438	1,439
Obs (CTAR)	120	120	121	125	131	143	155	155
N of Months	1,430	1,428	2,851	8,420	16,352	30,658	43,203	61,987
N of Clusters	120	120	121	125	131	143	155	155
Panel D: Subperiod 2003–2015								
	M&A	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.07***	0.06	0.07	-0.14	-0.09	-0.11	-0.13*	-0.14*
t-val	3.38	0.20	0.34	-1.16	-0.91	-1.41	-1.66	-1.94
BHAR(%)	2.10***	-0.05	-0.19	-2.16**	-2.81*	-5.76***	-7.34***	-7.75**
t-val	4.92	-0.13	-0.36	-2.14	-1.92	-2.81	-3.15	-2.44
CTAR(ctrl, FF3)(%)	2.07***	0.08	0.02	-0.30*	-0.15	-0.17	-0.21*	-0.23**
t-val	5.41	0.23	0.07	-1.78	-1.08	-1.54	-1.91	-2.17
CTAR(ctrl, FF5)(%)	2.07***	0.11	0.02	-0.30*	-0.15	-0.17	-0.21*	-0.22**
t-val	5.36	0.33	0.08	-1.66	-1.07	-1.58	-1.92	-2.13
CTAR(r_f, FF3)(%)	1.52***	0.00	0.15	-0.16	-0.14	-0.14	-0.18	-0.16
t-val	4.49	0.00	0.71	-1.20	-1.25	-1.07	-1.32	-1.16
CTAR(r_f, FF5)(%)	1.51***	0.01	0.14	-0.17	-0.15	-0.15	-0.19	-0.16
t-val	4.42	0.03	0.65	-1.20	-1.30	-1.17	-1.37	-1.11
Obs (BHAR)	1,901	1,899	1,899	1,899	1,899	1,899	1,899	1,900
Obs (CTAR)	155	155	155	155	155	155	155	155
N of Months	1,888	1,886	3,746	10,863	20,639	36,980	49,943	68,727
N of Clusters	155	155	155	155	155	155	155	155

Table 3: Tests of initial public offering (IPO) abnormal returns

The sample IPOs from 1980 to December 2015 that have returns available after the event month. Panel A reports results for the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Full sample period 1980–2015								
	IPO	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	NA	0.04	-0.13	-0.67***	-0.87***	-0.90***	-0.83***	-0.77***
t-val	NA	0.20	-0.72	-4.57	-6.56	-8.22	-8.64	-8.69
BHAR(%)	NA	1.05***	1.74***	-0.92	-6.96***	-11.74***	-19.14***	-24.76***
t-val	NA	3.70	4.28	-1.16	-6.03	-5.65	-7.95	-6.34
CTAR(ctrl, FF3)(%)	NA	1.75***	1.21***	0.20	-0.22	-0.34**	-0.29**	-0.20*
t-val	NA	3.72	3.17	0.76	-0.95	-2.11	-2.11	-1.65
CTAR(ctrl, FF5)(%)	NA	1.79***	1.32***	0.32	-0.08	-0.16	-0.12	-0.09
t-val	NA	3.78	3.51	1.24	-0.41	-1.03	-0.87	-0.73
CTAR(r_f, FF3)(%)	NA	1.98***	1.33***	0.17	-0.27	-0.40**	-0.33**	-0.23*
t-val	NA	4.89	3.73	0.66	-1.19	-2.31	-2.10	-1.68
CTAR(r_f, FF5)(%)	NA	2.04***	1.48***	0.34	-0.07	-0.16	-0.10	-0.07
t-val	NA	4.96	4.36	1.51	-0.37	-0.97	-0.61	-0.43
Obs (BHAR)	NA	8,191	8,347	8,347	8,347	8,347	8,347	8,347
Obs (CTAR)	NA	419	427	431	431	431	431	431
N of Months	NA	8,163	16,480	49,544	97,458	182,343	250,738	349,300
N of Clusters	NA	418	427	431	431	431	431	431
Panel B: Subperiod 1980–2002								
	IPO	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	NA	-0.07	-0.27	-0.71***	-0.99***	-1.02***	-0.93***	-0.85***
t-val	NA	-0.29	-1.27	-4.16	-6.51	-8.20	-8.57	-8.60
BHAR(%)	NA	0.96***	1.50***	-0.93	-8.88***	-14.38***	-22.89***	-29.33***
t-val	NA	2.94	3.26	-1.02	-6.72	-5.96	-8.17	-6.38
CTAR(ctrl, FF3)(%)	NA	1.81***	1.17***	0.27	-0.27	-0.40**	-0.33**	-0.22
t-val	NA	3.22	2.61	0.85	-1.01	-2.01	-1.97	-1.44
CTAR(ctrl, FF5)(%)	NA	1.84***	1.29***	0.40	-0.13	-0.20	-0.15	-0.11
t-val	NA	3.23	2.86	1.28	-0.54	-1.04	-0.86	-0.67
CTAR(r_f, FF3)(%)	NA	2.21***	1.42***	0.24	-0.27	-0.42**	-0.35*	-0.24
t-val	NA	4.65	3.43	0.82	-1.02	-1.97	-1.79	-1.44
CTAR(r_f, FF5)(%)	NA	2.26***	1.58***	0.45*	-0.05	-0.15	-0.10	-0.07
t-val	NA	4.58	3.97	1.66	-0.21	-0.74	-0.48	-0.38
Obs (BHAR)	NA	6,851	6,971	6,971	6,971	6,971	6,971	6,971
Obs (CTAR)	NA	273	276	281	287	299	311	335
N of Months	NA	6,827	13,773	41,430	81,768	153,858	212,871	299,047
N of Clusters	NA	273	276	281	287	299	311	335

Table 3, Continued

Panel C: Subperiod 2003–2012								
	IPO	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	NA	0.60	0.38	-0.43**	-0.23	-0.24	-0.25	-0.24*
t-val	NA	1.33	1.14	-1.98	-1.24	-1.41	-1.61	-1.70
BHAR(%)	NA	1.38**	2.72***	-0.84	2.77	0.36	-1.55	-3.52
t-val	NA	2.32	2.94	-0.51	1.08	0.10	-0.37	-0.63
CTAR(ctrl, FF3)(%)	NA	1.35*	1.35**	-0.09	0.10	0.06	0.00	0.01
t-val	NA	1.87	2.27	-0.25	0.30	0.20	0.00	0.06
CTAR(ctrl, FF5)(%)	NA	1.26*	1.29**	-0.13	0.09	0.07	0.02	0.03
t-val	NA	1.80	2.18	-0.34	0.29	0.24	0.10	0.16
CTAR(r_f, FF3)(%)	NA	0.60	0.93*	-0.21	-0.18	-0.13	-0.08	0.01
t-val	NA	0.88	1.73	-0.58	-0.62	-0.48	-0.32	0.04
CTAR(r_f, FF5)(%)	NA	0.47	0.85	-0.27	-0.21	-0.14	-0.08	0.03
t-val	NA	0.72	1.63	-0.75	-0.75	-0.50	-0.28	0.09
Obs (BHAR)	NA	953	975	975	975	975	975	975
Obs (CTAR)	NA	111	117	124	130	142	154	154
N of Months	NA	950	1,922	5,788	11,438	21,761	30,580	42,966
N of Clusters	NA	111	117	124	130	142	154	154
Panel D: Sub-period 2003–2015								
	IPO	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	NA	0.62	0.55	-0.51**	-0.25	-0.25	-0.27	-0.25*
t-val	NA	1.39	1.59	-2.08	-1.19	-1.37	-1.58	-1.67
BHAR(%)	NA	1.56***	2.97***	-0.85	2.74	1.65	-0.16	-1.56
t-val	NA	2.97	3.66	-0.64	1.34	0.55	-0.05	-0.36
CTAR(ctrl, FF3)(%)	NA	1.37**	1.45***	-0.08	0.16	0.06	0.02	0.02
t-val	NA	2.14	2.79	-0.22	0.54	0.24	0.09	0.12
CTAR(ctrl, FF5)(%)	NA	1.23*	1.34***	-0.17	0.09	0.03	0.02	0.03
t-val	NA	1.90	2.58	-0.47	0.32	0.11	0.06	0.17
CTAR(r_f, FF3)(%)	NA	0.82	1.03**	-0.11	-0.09	-0.13	-0.08	0.00
t-val	NA	1.41	2.24	-0.34	-0.33	-0.54	-0.32	0.01
CTAR(r_f, FF5)(%)	NA	0.65	0.92**	-0.20	-0.15	-0.17	-0.09	0.01
t-val	NA	1.14	1.98	-0.60	-0.58	-0.72	-0.38	0.03
Obs (BHAR)	NA	1,340	1,376	1,376	1,376	1,376	1,376	1,376
Obs (CTAR)	NA	146	151	154	154	154	154	154
N of Months	NA	1,336	2,707	8,114	15,690	28,485	37,867	50,253
N of Clusters	NA	145	151	154	154	154	154	154

Table 4: Seasoned equity offering (SEO) abnormal returns

The sample contains SEOs from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Full sample period 1980–2015								
	SEO	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-0.24	0.85***	0.21	-0.12	-0.29***	-0.35***	-0.36***	-0.34***
t-val	-1.12	4.96	1.62	-1.32	-3.91	-5.55	-6.10	-6.09
BHAR(%)	0.84***	1.45***	1.12***	1.38**	-0.73	-4.79***	-6.77***	-5.39*
t-val	2.74	5.02	2.87	2.01	-0.63	-2.87	-3.54	-1.75
CTAR(ctrl, FF3)(%)	0.77*	1.46***	0.54**	0.10	-0.15	-0.26**	-0.31***	-0.26***
t-val	1.81	4.27	2.25	0.58	-1.07	-2.50	-2.92	-2.86
CTAR(ctrl, FF5)(%)	0.72	1.35***	0.45*	0.07	-0.15	-0.26**	-0.30***	-0.27***
t-val	1.64	3.80	1.82	0.41	-1.03	-2.28	-2.72	-2.78
CTAR(r_f, FF3)(%)	0.20	0.58***	-0.09	-0.37***	-0.50***	-0.60***	-0.55***	-0.42***
t-val	0.55	2.79	-0.51	-2.74	-4.98	-5.77	-4.95	-3.66
CTAR(r_f, FF5)(%)	0.20	0.61***	-0.07	-0.30**	-0.41***	-0.51***	-0.48***	-0.37***
t-val	0.54	2.86	-0.41	-2.18	-3.67	-4.79	-4.29	-3.16
Obs (BHAR)	7,027	7,022	7,022	7,023	7,023	7,024	7,024	7,025
Obs (CTAR)	428	428	430	431	431	431	431	431
N of Months	6,965	6,970	13,849	40,539	77,601	141,890	194,322	272,326
N of Clusters	428	428	430	431	431	431	431	431
Panel B: Subperiod 1980–2002								
	SEO	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.36	1.29***	0.51***	0.08	-0.18*	-0.29***	-0.28***	-0.27***
t-val	1.32	5.71	3.04	0.65	-1.77	-3.59	-3.86	-4.09
BHAR(%)	1.42***	2.30***	2.25***	3.67***	1.07	-4.02**	-6.57***	-4.12
t-val	3.98	6.87	4.72	4.36	0.81	-2.00	-2.80	-1.03
CTAR(ctrl, FF3)(%)	1.38***	2.35***	1.14***	0.50**	0.09	-0.15	-0.23*	-0.19**
t-val	3.24	5.84	3.82	2.23	0.52	-1.21	-1.92	-2.01
CTAR(ctrl, FF5)(%)	1.29***	2.18***	0.98***	0.40*	0.04	-0.17	-0.25*	-0.22**
t-val	2.78	4.93	2.85	1.68	0.21	-1.20	-1.90	-2.02
CTAR(r_f, FF3)(%)	0.31	1.06***	0.29	-0.13	-0.37***	-0.57***	-0.55***	-0.41***
t-val	0.81	4.22	1.41	-0.75	-2.92	-4.54	-4.20	-3.38
CTAR(r_f)(%)	0.27	1.12***	0.34*	-0.02	-0.23*	-0.45***	-0.45***	-0.35***
t-val	0.68	4.36	1.67	-0.12	-1.73	-3.56	-3.63	-2.83
Obs (BHAR)	4,337	4,336	4,336	4,337	4,337	4,337	4,337	4,337
Obs (CTAR)	273	273	276	281	287	299	311	335
N of Months	4,305	4,310	8,579	25,227	48,883	91,213	127,248	183,047
N of Clusters	273	273	276	281	287	299	311	335

Table 4, Continued

Panel C: Subperiod 2003–2012								
	SEO	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-0.89**	0.21	-0.23	-0.30**	-0.44***	-0.39***	-0.45***	-0.45***
t-val	-2.52	0.69	-1.12	-2.13	-3.59	-3.89	-4.64	-4.48
BHAR(%)	-0.01	0.37	-0.65	-0.91	-4.02*	-5.46	-5.73	-6.23
t-val	-0.01	0.76	-0.88	-0.65	-1.69	-1.48	-1.36	-0.97
CTAR(ctrl, FF3)(%)	-0.23	0.33	-0.36	-0.17	-0.37*	-0.28*	-0.31*	-0.32*
t-val	-0.30	0.61	-1.00	-0.65	-1.79	-1.69	-1.84	-1.91
CTAR(ctrl, FF5)(%)	-0.23	0.33	-0.36	-0.17	-0.36*	-0.28*	-0.30*	-0.30*
t-val	-0.30	0.61	-1.02	-0.67	-1.88	-1.70	-1.78	-1.82
CTAR(r_f, FF3)(%)	0.33	-0.01	-0.57**	-0.45*	-0.51**	-0.43**	-0.38*	-0.33
t-val	0.49	-0.02	-2.00	-1.84	-2.25	-2.05	-1.91	-1.58
CTAR(r_f, FF5)(%)	0.32	-0.03	-0.60**	-0.48**	-0.53**	-0.44**	-0.38*	-0.32
t-val	0.47	-0.08	-2.11	-2.02	-2.34	-2.22	-1.77	-1.54
Obs (BHAR)	1,985	1,981	1,981	1,981	1,981	1,982	1,982	1,983
Obs (CTAR)	120	120	121	125	131	143	155	155
N of Months	1,962	1,962	3,899	11,432	22,029	40,712	56,277	78,482
N of Clusters	120	120	121	125	131	143	155	155
Panel D: Subperiod 2003–2015								
	SEO	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-1.21***	0.14	-0.28	-0.44***	-0.50***	-0.46***	-0.52***	-0.50***
t-val	-3.67	0.56	-1.48	-3.30	-4.44	-4.54	-5.10	-4.75
BHAR(%)	-0.11	0.08	-0.71	-2.33**	-3.64*	-6.01**	-7.08**	-7.45
t-val	-0.19	0.15	-1.07	-1.99	-1.69	-2.07	-2.18	-1.54
CTAR(ctrl, FF3)(%)	-0.29	-0.23	-0.54	-0.50*	-0.49**	-0.42**	-0.43**	-0.41**
t-val	-0.38	-0.36	-1.44	-1.94	-2.41	-2.32	-2.48	-2.36
CTAR(ctrl, FF5)(%)	-0.29	-0.24	-0.55	-0.52**	-0.51***	-0.43**	-0.43**	-0.40**
t-val	-0.37	-0.38	-1.45	-2.00	-2.58	-2.45	-2.48	-2.32
CTAR(r_f, FF3)(%)	0.08	-0.15	-0.66**	-0.66***	-0.60***	-0.57***	-0.52**	-0.44**
t-val	0.12	-0.44	-2.40	-2.74	-2.69	-2.70	-2.47	-2.03
CTAR(r_f, FF5)(%)	0.07	-0.18	-0.67**	-0.69***	-0.63***	-0.59***	-0.53**	-0.44**
t-val	0.09	-0.50	-2.37	-2.96	-2.88	-2.85	-2.55	-2.06
Obs (BHAR)	2,690	2,686	2,686	2,686	2,686	2,687	2,687	2,688
Obs (CTAR)	155	155	155	155	155	155	155	155
N of Months	2,660	2,660	5,270	15,312	28,718	50,677	67,074	89,279
N of Clusters	155	155	155	155	155	155	155	155

Table 5: Tests of dividend initiation (DIV) abnormal returns

The sample contains dividend initiations (DIVs) from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for events in the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: BHAR and ASR t-values are defined in equations (7)and (5), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: * = 0.10, ** = 0.05, and *** = 0.01.

Panel A: Full sample period 1980–2015								
	DIV	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.10***	0.79**	0.76***	0.61***	0.47***	0.29***	0.18***	0.10
t-val	5.59	2.12	2.68	3.99	4.25	3.45	2.61	1.62
BHAR(%)	2.14***	1.32**	1.90***	4.03***	4.70**	8.60***	6.84*	7.89
t-val	3.36	2.54	2.63	3.05	2.02	2.72	1.69	1.24
CTAR(ctrl, FF3)(%)	2.62***	1.42**	1.17***	0.66***	0.51***	0.31**	0.14	0.00
t-val	4.03	2.55	2.84	3.16	3.19	2.43	1.29	0.03
CTAR(ctrl, FF5)(%)	2.68***	1.40**	1.16***	0.69***	0.54***	0.32**	0.14	0.01
t-val	4.74	2.46	2.77	3.31	3.45	2.48	1.33	0.09
CTAR(r_f, FF3)(%)	3.14***	1.08***	0.82***	0.53***	0.51***	0.29***	0.17*	0.07
t-val	7.77	2.86	3.21	3.72	4.33	2.81	1.67	0.56
CTAR(r_f, FF5)(%)	3.01***	1.06***	0.81***	0.57***	0.54***	0.31***	0.20*	0.09
t-val	7.56	2.82	3.20	4.16	4.75	3.09	1.88	0.75
Obs (BHAR)	1,266	1,260	1,260	1,261	1,261	1,261	1,261	1,261
Obs (CTAR)	373	373	417	431	431	431	431	431
N of Months	1,250	1,249	2,490	7,285	14,007	25,628	35,239	49,670
N of Clusters	373	373	417	431	431	431	431	431
Panel B: Subperiod 1980–2002								
	DIV	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.08***	0.62	0.49	0.43*	0.50***	0.26**	0.11	0.04
t-val	3.91	1.17	1.23	1.92	3.45	2.32	1.25	0.49
BHAR(%)	1.81	1.89**	2.00*	3.14	5.97	12.93**	12.09*	17.65*
t-val	1.64	2.36	1.79	1.56	1.52	2.49	1.82	1.69
CTAR(ctrl, FF3)(%)	2.24*	2.06**	1.38**	0.45	0.60***	0.28	0.06	-0.11
t-val	1.87	2.33	2.16	1.47	2.63	1.52	0.37	-0.84
CTAR(ctrl, FF5)(%)	2.68***	2.06**	1.41**	0.47	0.66***	0.31*	0.08	-0.09
t-val	2.59	2.27	2.19	1.51	3.01	1.76	0.55	-0.67
CTAR(r_f, FF3)(%)	3.41***	1.49**	0.90**	0.39*	0.56***	0.30*	0.16	0.02
t-val	5.57	2.33	2.06	1.76	2.91	1.94	1.16	0.15
CTAR(r_f, FF5)(%)	3.20***	1.54**	0.90**	0.46**	0.63***	0.34**	0.20	0.07
t-val	5.40	2.41	2.14	2.18	3.45	2.33	1.60	0.57
Obs (BHAR)	632	628	628	629	629	629	629	629
Obs (CTAR)	231	231	264	281	287	299	311	335
N of Months	621	620	1,239	3,635	7,039	13,059	18,171	26,375
N of Clusters	231	231	264	281	287	299	311	335

Table 5, Continued

Panel C: Subperiod 2003–2012								
	DIV	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.34***	1.03*	1.29***	0.65***	0.35*	0.25*	0.22*	0.13
t-val	3.90	1.66	2.87	2.73	1.80	1.72	1.79	1.25
BHAR(%)	2.75***	1.19*	2.94***	4.58**	2.58	4.56	2.20	-2.13
t-val	3.62	1.69	2.96	2.34	0.88	1.09	0.40	-0.24
CTAR(ctrl, FF3)(%)	3.10***	1.27*	1.58***	0.77***	0.37	0.26	0.19	0.08
t-val	4.00	1.74	3.06	2.61	1.39	1.34	1.08	0.55
CTAR(ctrl, FF5)(%)	3.00***	1.27*	1.58***	0.80***	0.37	0.27	0.19	0.08
t-val	3.89	1.68	2.98	2.77	1.44	1.36	1.07	0.54
CTAR(r_f, FF3)(%)	3.00***	0.76*	0.81***	0.63***	0.47***	0.25	0.15	0.05
t-val	4.77	1.68	2.60	3.26	3.16	1.61	0.91	0.24
CTAR(r_f, FF5)(%)	2.93***	0.72	0.80**	0.63***	0.46***	0.24	0.14	0.04
t-val	4.58	1.55	2.48	3.26	3.12	1.53	0.88	0.22
Obs (BHAR)	505	503	503	503	503	503	503	503
Obs (CTAR)	109	109	120	125	131	143	155	155
N of Months	501	501	997	2,933	5,694	10,616	14,934	21,161
N of Clusters	109	109	120	125	131	143	155	155
Panel D: Subperiod 2003–2015								
	DIV	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.11***	0.95*	1.03***	0.80***	0.44***	0.32**	0.26**	0.16*
t-val	3.98	1.83	2.59	3.82	2.64	2.53	2.35	1.73
BHAR(%)	2.48***	0.75	1.79**	4.93***	3.43	4.29	1.62	-1.82
t-val	3.80	1.13	1.96	2.87	1.38	1.19	0.35	-0.25
CTAR(ctrl, FF3)(%)	2.96***	0.77	1.01**	0.86***	0.43*	0.31*	0.21	0.11
t-val	4.32	1.14	2.06	3.16	1.89	1.80	1.37	0.83
CTAR(ctrl, FF5)(%)	2.91***	0.76	0.99*	0.86***	0.42*	0.32*	0.22	0.11
t-val	4.39	1.07	1.90	3.30	1.90	1.83	1.39	0.85
CTAR(r_f, FF3)(%)	2.72***	0.66	0.71**	0.65***	0.45***	0.24*	0.14	0.06
t-val	4.83	1.60	2.45	3.76	3.52	1.79	0.98	0.31
CTAR(r_f, FF5)(%)	2.69***	0.64	0.70**	0.64***	0.44***	0.23*	0.13	0.05
t-val	4.73	1.50	2.36	3.75	3.48	1.72	0.93	0.27
Obs (BHAR)	634	632	632	632	632	632	632	632
Obs (CTAR)	142	142	154	155	155	155	155	155
N of Months	629	629	1,251	3,650	6,968	12,569	17,068	23,295
N of Clusters	142	142	154	155	155	155	155	155

Table 6: Stock repurchase (REP) abnormal returns

The sample contains share repurchase announcements (REP) from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for events in the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Full sample period 1980–2015								
	REP	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.05***	0.49***	0.48***	0.40***	0.40***	0.41***	0.37***	0.34***
t-val	7.81	4.37	5.89	6.57	7.54	8.77	8.48	7.79
BHAR(%)	1.00***	0.43***	0.84***	2.31***	4.26***	8.53***	10.75***	14.31***
t-val	6.24	2.68	3.77	5.68	6.29	7.59	8.67	8.56
CTAR(ctrl, FF3)(%)	1.01***	0.44**	0.46***	0.37***	0.35***	0.33***	0.29***	0.25***
t-val	4.92	2.20	3.51	3.94	4.54	4.83	4.50	4.04
CTAR(ctrl, FF5)(%)	1.10***	0.45**	0.48***	0.37***	0.35***	0.33***	0.29***	0.25***
t-val	5.84	2.32	3.70	4.19	4.84	5.23	4.93	4.39
CTAR(r_f, FF3)(%)	0.77***	0.80***	0.59***	0.40***	0.33***	0.35***	0.34***	0.31***
t-val	3.29	3.81	4.10	3.37	2.84	3.40	3.27	3.26
CTAR(r_f, FF5)(%)	0.89***	0.81***	0.61***	0.42***	0.36***	0.36***	0.35***	0.32***
t-val	4.13	3.73	4.05	3.42	2.91	3.32	3.11	3.11
Obs (BHAR)	15,639	15,634	15,634	15,634	15,635	15,635	15,635	15,635
Obs (CTAR)	409	409	415	421	423	423	423	423
N of Months	15,523	15,521	30,835	90,013	171,796	311,029	423,666	591,066
N of Clusters	409	409	415	421	423	423	423	423
Panel B: Subperiod 1980–2002								
	REP	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.13***	0.67***	0.56***	0.50***	0.48***	0.51***	0.47***	0.40***
t-val	6.42	4.42	5.10	6.19	6.73	8.29	7.99	7.30
BHAR(%)	1.14***	0.54**	0.95***	3.05***	5.41***	11.02***	14.81***	19.00***
t-val	5.10	2.35	3.02	5.48	5.42	6.47	8.07	7.57
CTAR(ctrl, FF3)(%)	1.13***	0.47	0.51**	0.41***	0.36***	0.39***	0.35***	0.27***
t-val	3.94	1.53	2.46	2.92	3.22	3.95	3.68	3.17
CTAR(ctrl, FF5)(%)	1.30***	0.49	0.58***	0.44***	0.38***	0.39***	0.35***	0.26***
t-val	5.05	1.63	2.80	3.33	3.61	4.27	4.02	3.34
CTAR(r_f, FF5)(%)	1.03***	0.97***	0.75***	0.48***	0.40***	0.41***	0.41***	0.35***
t-val	3.45	2.80	3.11	2.91	2.83	3.00	2.77	2.65
CTAR(r_f, FF3)(%)	0.76**	0.91***	0.66***	0.40**	0.32**	0.37***	0.37***	0.31***
t-val	2.22	2.72	3.03	2.51	2.29	2.88	2.77	2.64
Obs (BHAR)	9,563	9,562	9,562	9,562	9,563	9,563	9,563	9,563
Obs (CTAR)	254	254	261	271	279	291	303	327
N of Months	9,486	9,485	18,862	55,218	105,666	192,470	263,951	373,309
N of Clusters	254	254	261	271	279	291	303	327

Table 6, Continued

Panel C: Subperiod 2003–2012								
	REP	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.80***	0.19	0.39***	0.24**	0.26***	0.25***	0.21***	0.22***
t-val	3.43	1.03	2.86	2.28	3.07	3.30	3.16	3.23
BHAR(%)	0.75***	0.24	0.63*	1.18*	2.62***	5.50***	5.01***	8.20***
t-val	2.99	1.03	1.95	1.74	2.95	4.26	3.04	3.94
CTAR(ctrl, FF3)(%)	0.75***	0.35	0.37**	0.21*	0.23**	0.21**	0.16**	0.19**
t-val	2.80	1.45	2.37	1.67	2.16	1.99	2.01	2.38
CTAR(ctrl, FF5)(%)	0.76***	0.36	0.37**	0.20	0.22**	0.21*	0.16**	0.20**
t-val	2.83	1.47	2.38	1.64	2.01	1.96	2.06	2.44
CTAR(r_f, FF3)(%)	0.66***	0.48***	0.34**	0.27*	0.21	0.22	0.19	0.21
t-val	2.93	2.61	2.10	1.89	1.31	1.51	1.28	1.50
CTAR(r_f, FF5)(%)	0.66***	0.46**	0.32**	0.25*	0.21	0.23	0.19	0.22
t-val	2.78	2.44	1.96	1.68	1.21	1.45	1.23	1.45
Obs (BHAR)	4,828	4,825	4,825	4,825	4,825	4,825	4,825	4,825
Obs (CTAR)	120	120	121	125	131	143	155	155
N of Months	4,795	4,794	9,544	28,050	54,103	100,458	139,891	197,933
N of Clusters	120	120	121	125	131	143	155	155
Panel D: Subperiod 2003–2015								
	REP	Post-Event Windows						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.92***	0.21	0.36***	0.24***	0.26***	0.24***	0.22***	0.22***
t-val	4.44	1.33	3.03	2.66	3.55	3.59	3.51	3.44
BHAR(%)	0.77***	0.25	0.65**	1.14**	2.44***	4.60***	4.37***	6.91***
t-val	3.63	1.29	2.32	2.00	3.26	4.29	3.22	4.08
CTAR(ctrl, FF3)(%)	0.81***	0.34*	0.36***	0.23**	0.23***	0.20**	0.16**	0.19**
t-val	3.42	1.74	2.79	2.15	2.61	2.20	2.17	2.44
CTAR(ctrl, FF5)(%)	0.82***	0.35*	0.37***	0.23**	0.23**	0.20**	0.16**	0.19**
t-val	3.44	1.76	2.79	2.17	2.49	2.18	2.21	2.48
CTAR(r_f, FF3)(%)	0.70***	0.52***	0.39***	0.28**	0.22*	0.22*	0.19	0.22*
t-val	3.80	3.54	2.88	2.45	1.65	1.76	1.49	1.67
CTAR(r_f, FF5)(%)	0.70***	0.51***	0.37***	0.27**	0.21	0.22*	0.19	0.22
t-val	3.63	3.36	2.72	2.25	1.53	1.69	1.42	1.60
Obs (BHAR)	6,076	6,072	6,072	6,072	6,072	6,072	6,072	6,072
Obs (CTAR)	155	155	155	155	155	155	155	155
N of Months	6,037	6,036	11,973	34,795	66,130	118,559	159,715	217,757
N of Clusters	155	155	155	155	155	155	155	155

Table 7: Stock split announcement (SPLTA) abnormal returns

The sample contains share split announcements (SPLTA) from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for events in the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Post event 1980–2015								
	SPLTA	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.91***	0.00	0.16	0.37***	0.25**	0.21***	0.19***	0.19***
t-val	4.16	-0.01	0.61	2.78	2.45	2.77	2.98	3.57
BHAR(%)	3.75***	1.35***	1.88***	5.10***	6.18***	9.73***	13.28***	21.21***
t-val	12.94	4.80	4.66	7.69	5.75	6.59	7.18	5.75
CTAR(ctrl, FF3)(%)	3.74***	1.43***	1.11***	0.96***	0.66***	0.46***	0.32***	0.24***
t-val	9.68	4.39	4.06	5.20	4.57	4.89	4.01	3.76
CTAR(ctrl, FF5)(%)	3.65***	1.44***	1.13***	0.95***	0.64***	0.48***	0.33***	0.25***
t-val	9.18	4.31	3.76	4.71	4.17	4.90	3.96	3.79
CTAR(r_f, FF3)(%)	3.08***	1.20***	1.01***	0.67***	0.32***	0.08	0.00	-0.02
t-val	11.66	4.27	4.87	5.40	3.11	0.79	-0.03	-0.22
CTAR(r_f, FF5)(%)	3.11***	1.24***	1.09***	0.74***	0.39***	0.19**	0.07	0.03
t-val	11.30	4.46	5.28	6.13	3.91	1.99	0.80	0.39
Obs (BHAR)	4,415	4,417	4,417	4,417	4,417	4,417	4,417	4,417
Obs (CTAR)	410	410	428	436	442	454	466	478
N of Months	4,393	4,396	8,754	25,782	50,117	94,815	134,262	199,898
N of Clusters	410	410	428	436	442	454	466	478
Panel B: Post event 1980–2002								
	SPLTA	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.07***	-0.06	0.22	0.41***	0.27**	0.22**	0.22***	0.22***
t-val	3.83	-0.11	0.72	2.64	2.30	2.48	2.96	3.61
BHAR(%)	4.09***	1.46***	2.19***	5.69***	6.77***	10.37***	14.94***	24.95***
t-val	12.53	4.53	4.74	7.55	5.59	6.29	7.11	5.89
CTAR(ctrl, FF3)(%)	4.07***	1.56***	1.30***	1.08***	0.75***	0.52***	0.40***	0.30***
t-val	9.25	4.16	4.15	5.03	4.40	4.76	4.30	3.99
CTAR(ctrl, FF5)(%)	3.92***	1.55***	1.29***	1.05***	0.72***	0.55***	0.41***	0.30***
t-val	8.42	4.00	3.68	4.37	3.82	4.62	4.07	3.85
CTAR(r_f, FF3)(%)	3.34***	1.33***	1.17***	0.75***	0.32***	0.06	-0.02	-0.05
t-val	11.42	4.16	4.99	5.38	2.70	0.43	-0.23	-0.50
CTAR(r_f, FF5)(%)	3.34***	1.36***	1.24***	0.83***	0.41***	0.18	0.05	0.00
t-val	10.86	4.27	5.31	6.12	3.44	1.52	0.52	0.01
Obs (BHAR)	3,683	3,684	3,684	3,684	3,684	3,684	3,684	3,684
Obs (CTAR)	274	274	276	280	286	298	310	334
N of Months	3,664	3,667	7,300	21,465	41,641	78,607	111,054	164,532
N of Clusters	274	274	276	280	286	298	310	334

Table 7, Continued

Panel C: Subperiod 2003–2012								
	SPLTA	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.08**	0.33	-0.17	0.14	0.14	0.21	0.06	0.03
t-val	2.11	0.70	-0.48	0.63	0.81	1.56	0.48	0.28
BHAR(%)	2.17***	0.87	0.43	2.22	3.67	7.33**	5.54	1.85
t-val	3.35	1.62	0.56	1.62	1.52	2.07	1.45	0.27
CTAR(ctrl, FF3)(%)	2.12***	0.83	0.35	0.45	0.35*	0.34**	0.11	0.04
t-val	3.56	1.42	0.75	1.62	1.85	2.25	0.79	0.42
CTAR(ctrl, FF5)(%)	2.09***	0.82	0.30	0.40	0.31*	0.33**	0.10	0.04
t-val	3.52	1.39	0.77	1.49	1.81	2.26	0.80	0.49
CTAR(r_f)(%)	1.92***	0.35	0.20	0.23	0.34**	0.32***	0.16	0.13
t-val	3.59	0.78	0.53	0.93	2.05	3.06	1.41	1.35
CTAR(r_f, FF3)(%)	1.97***	0.43	0.26	0.31	0.40**	0.35***	0.17	0.14
t-val	3.64	0.95	0.65	1.20	2.03	2.68	1.31	1.29
CTAR(r_f, FF5)(%)	1.92***	0.35	0.20	0.23	0.34**	0.32***	0.16	0.13
t-val	3.59	0.78	0.53	0.93	2.05	3.06	1.41	1.35
Obs (BHAR)	651	652	652	652	652	652	652	652
Obs (CTAR)	104	104	117	125	131	143	155	179
N of Months	648	648	1,292	3,837	7,534	14,367	20,533	31,285
N of Clusters	104	104	117	125	131	143	155	179
Panel D: Subperiod 2003–2015								
	SPLTA	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	1.09**	0.29	-0.15	0.18	0.14	0.17	0.06	0.04
t-val	2.27	0.64	-0.45	0.86	0.91	1.39	0.50	0.44
BHAR(%)	2.05***	0.79	0.33	2.17*	3.22	6.52**	4.90	2.39
t-val	3.44	1.59	0.45	1.69	1.46	2.01	1.39	0.38
CTAR(ctrl, FF3)(%)	2.01***	0.70	0.23	0.41	0.28	0.27**	0.08	0.04
t-val	3.54	1.29	0.55	1.61	1.64	1.99	0.65	0.49
CTAR(ctrl, FF5)(%)	1.96***	0.69	0.17	0.36	0.25	0.26**	0.08	0.04
t-val	3.55	1.26	0.46	1.46	1.55	1.97	0.65	0.53
CTAR(r_f, FF3)(%)	1.73***	0.43	0.26	0.30	0.36*	0.30**	0.15	0.12
t-val	3.52	1.06	0.72	1.29	1.92	2.43	1.19	1.25
CTAR(r_f, FF5)(%)	1.66***	0.35	0.18	0.23	0.30*	0.26***	0.13	0.12
t-val	3.41	0.87	0.53	0.99	1.88	2.65	1.21	1.27
Obs (BHAR)	732	733	733	733	733	733	733	733
Obs (CTAR)	136	136	153	161	167	179	191	203
N of Months	729	729	1,454	4,317	8,476	16,208	23,208	35,366
N of Clusters	136	136	153	161	167	179	191	203

Table 8: Stock split (SPLT) abnormal returns

The sample contains share splits (SPLTs) from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for events in the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Post event 1980–2015								
	SPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.41***	0.49**	0.42**	0.46***	0.31***	0.24***	0.21***	0.20***
t-val	11.52	2.15	2.36	3.93	3.22	3.35	3.45	3.83
BHAR(%)	3.79***	1.32***	1.87***	5.11***	6.26***	10.24***	13.67***	20.78***
t-val	13.04	4.73	4.66	7.72	5.79	7.05	7.47	5.67
CTAR(ctrl, FF3)(%)	3.81***	1.47***	1.12***	0.95***	0.64***	0.46***	0.32***	0.23***
t-val	9.61	4.46	3.91	5.24	4.69	4.97	4.17	3.74
CTAR(ctrl, FF5)(%)	3.73***	1.46***	1.12***	0.94***	0.63***	0.48***	0.34***	0.24***
t-val	9.40	4.22	3.64	4.88	4.39	5.01	4.11	3.85
CTAR(r_f, FF3)(%)	3.09***	1.19***	1.01***	0.67***	0.32***	0.08	0.00	-0.02
t-val	11.91	4.31	4.87	5.40	3.09	0.81	-0.02	-0.28
CTAR(r_f, FF5)(%)	3.13***	1.24***	1.08***	0.74***	0.39***	0.19**	0.07	0.02
t-val	11.58	4.48	5.27	6.13	3.86	1.99	0.78	0.30
Obs (BHAR)	4,447	4,449	4,449	4,449	4,449	4,449	4,449	4,449
Obs (CTAR)	411	411	429	437	443	455	467	479
N of Months	4,422	4,426	8,818	25,959	50,435	95,384	135,018	201,081
N of Clusters	411	411	429	437	443	455	467	479
Panel B: Post event 1980–2002								
	SPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	2.74***	0.54**	0.54***	0.51***	0.33***	0.27***	0.25***	0.23***
t-val	12.02	2.11	2.65	3.77	3.03	3.15	3.49	3.82
BHAR(%)	4.23***	1.44***	2.22***	5.62***	6.71***	10.89***	15.47***	24.21***
t-val	13.06	4.50	4.86	7.46	5.48	6.69	7.43	5.74
CTAR(ctrl, FF3)(%)	4.24***	1.61***	1.33***	1.06***	0.72***	0.52***	0.39***	0.29***
t-val	9.54	4.26	4.06	5.03	4.48	4.86	4.39	3.89
CTAR(ctrl, FF5)(%)	4.12***	1.57***	1.29***	1.02***	0.69***	0.55***	0.41***	0.29***
t-val	9.08	3.89	3.61	4.46	3.99	4.77	4.19	3.85
CTAR(r_f, FF3)(%)	3.36***	1.33***	1.17***	0.75***	0.32***	0.06	-0.02	-0.05
t-val	11.72	4.18	5.01	5.37	2.69	0.45	-0.23	-0.59
CTAR(r_f, FF5)(%)	3.38***	1.35***	1.23***	0.83***	0.41***	0.18	0.05	-0.01
t-val	11.20	4.26	5.32	6.15	3.42	1.53	0.49	-0.11
Obs (BHAR)	3,709	3,710	3,710	3,710	3,710	3,710	3,710	3,710
Obs (CTAR)	275	275	277	281	287	299	311	335
N of Months	3,687	3,691	7,352	21,613	41,896	79,046	111,608	165,415
N of Clusters	275	275	277	281	287	299	311	335

Table 8, Continued

Panel C: Subperiod 2003–2012								
	SPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.77	0.28	-0.19	0.21	0.19	0.19	0.06	0.04
t-val	1.47	0.61	-0.57	0.95	1.10	1.38	0.49	0.45
BHAR(%)	1.63**	0.84	0.22	2.75**	4.76**	7.95**	5.35	2.88
t-val	2.37	1.60	0.27	2.05	2.02	2.33	1.43	0.42
CTAR(ctrl, FF3l)(%)	1.74***	0.89	0.25	0.51*	0.41**	0.34**	0.14	0.06
t-val	3.40	1.61	0.58	1.85	2.08	2.25	1.00	0.64
CTAR(ctrl, FF3)(%)	1.70***	0.86	0.20	0.46*	0.37**	0.33**	0.13	0.07
t-val	3.31	1.58	0.56	1.72	2.03	2.26	1.03	0.71
CTAR(r_f, FF5)(%)	1.95***	0.46	0.25	0.30	0.40**	0.34**	0.18	0.14
t-val	3.57	1.05	0.63	1.18	1.97	2.55	1.36	1.35
CTAR(r_f, FF5)(%)	1.90***	0.38	0.18	0.23	0.34**	0.31***	0.16	0.14
t-val	3.54	0.86	0.49	0.90	1.98	2.85	1.43	1.41
Obs (BHAR)	657	658	658	658	658	658	658	658
Obs (CTAR)	104	104	117	125	131	143	155	179
N of Months	654	654	1,304	3,866	7,597	14,497	20,735	31,583
N of Clusters	104	104	117	125	131	143	155	179
Panel D: Subperiod 2003–2015								
	SPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.76	0.20	-0.19	0.23	0.18	0.14	0.05	0.05
t-val	1.54	0.46	-0.61	1.09	1.11	1.14	0.44	0.64
BHAR(%)	1.54**	0.72	0.09	2.59**	4.04*	6.96**	4.60	3.61
t-val	2.43	1.47	0.12	2.05	1.87	2.23	1.32	0.58
CTAR(ctrl, FF3)(%)	1.60***	0.71	0.13	0.46*	0.32*	0.26*	0.10	0.07
t-val	3.00	1.39	0.32	1.82	1.78	1.91	0.81	0.76
CTAR(ctrl, FF5)(%)	1.53***	0.69	0.07	0.41*	0.29*	0.25*	0.10	0.07
t-val	2.93	1.35	0.21	1.68	1.68	1.88	0.81	0.79
CTAR(r_f, FF3)(%)	1.69***	0.46	0.24	0.30	0.35*	0.29**	0.15	0.13
t-val	3.39	1.16	0.69	1.27	1.86	2.30	1.23	1.31
CTAR(r_f, FF5)(%)	1.62***	0.38	0.16	0.22	0.29*	0.26**	0.14	0.12
t-val	3.28	0.96	0.49	0.97	1.82	2.46	1.24	1.31
Obs (BHAR)	738	739	739	739	739	739	739	739
Obs (CTAR)	136	136	153	161	167	179	191	203
N of Months	735	735	1,466	4,346	8,539	16,338	23,410	35,666
N of Clusters	136	136	153	161	167	179	191	203

Table 8, Continued

Panel E: Subperiod 2003–2012, 7 event firms removed with most extreme monthly return during the first year								
	SPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.69	0.25	-0.27	0.17	0.16	0.18	0.05	0.03
t-val	1.30	0.52	-0.85	0.76	0.90	1.28	0.40	0.29
BHAR(%)	1.45**	0.77	-0.16	2.03	2.88	7.36**	4.92	1.74
t-val	2.11	1.47	-0.20	1.58	1.40	2.14	1.31	0.25
CTAR(ctrl, FF3)(%)	1.52***	0.79	-0.01	0.40	0.32*	0.31**	0.11	0.04
t-val	2.92	1.41	-0.02	1.54	1.68	2.11	0.83	0.38
CTAR(ctrl, FF5)(%)	1.48***	0.76	-0.05	0.35	0.28	0.30**	0.11	0.04
t-val	2.85	1.35	-0.12	1.40	1.60	2.14	0.86	0.45
CTAR(r_f, FF3)(%)	1.80***	0.48	0.15	0.23	0.33	0.32**	0.16	0.13
t-val	3.46	1.04	0.39	0.92	1.63	2.26	1.20	1.22
CTAR(r_f, FF5)(%)	1.75***	0.40	0.08	0.15	0.27	0.28**	0.15	0.13
t-val	3.39	0.87	0.23	0.63	1.60	2.55	1.27	1.29
Obs (BHAR)	650	651	651	651	651	651	651	651
Obs (CTAR)	104	104	117	125	131	143	155	179
N of Months	647	647	1,290	3,827	7,522	14,360	20,541	31,293
N of Clusters	104	104	117	125	131	143	155	179
Panel F: Subperiod 2003–2015, 7 event firms removed with most extreme monthly return during the first year								
	SPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	0.69	0.17	-0.26	0.19	0.15	0.13	0.04	0.04
t-val	1.38	0.39	-0.86	0.92	0.92	1.04	0.36	0.49
BHAR(%)	1.38**	0.65	-0.25	1.94	2.36	6.42**	4.20	2.61
t-val	2.18	1.34	-0.33	1.60	1.25	2.05	1.21	0.42
CTAR(ctrl, FF3)(%)	1.41***	0.61	-0.10	0.36	0.24	0.24*	0.08	0.04
t-val	2.68	1.18	-0.26	1.51	1.39	1.76	0.65	0.50
CTAR(ctrl, FF5)(%)	1.34***	0.59	-0.15	0.31	0.20	0.22*	0.08	0.05
t-val	2.60	1.13	-0.43	1.35	1.26	1.74	0.64	0.53
CTAR(r_f, FF3)(%)	1.55***	0.47	0.15	0.23	0.29	0.27**	0.14	0.12
t-val	3.26	1.15	0.45	1.01	1.54	2.03	1.09	1.18
CTAR(r_f, FF5)(%)	1.49***	0.40	0.07	0.16	0.23	0.24**	0.12	0.11
t-val	3.13	0.96	0.22	0.70	1.45	2.18	1.09	1.18
Obs (BHAR)	731	732	732	732	732	732	732	732
Obs (CTAR)	136	136	153	161	167	179	191	203
N of Months	728	728	1,452	4,307	8,464	16,201	23,216	35,376
N of Clusters	136	136	153	161	167	179	191	203

Table 9: Reverse stock split (RSPLT) abnormal returns

The sample contains share reverse splits (RSPLT) from January 1980 to December 2015 that have returns available after the event month. Panel A reports results for events in the full sample period, Panel B for subperiod 1980–2002, Panel C for subperiod 2003–2012 corresponding to Fu and Huang, and Panel D for subperiod 2003–2015. ASR is the average per month abnormal standardized return defined in equation (6), BHAR is the buy-and-hold abnormal return defined in equation (2), and CTAR(control), CTAR(ctrl, FF3), CTAR(ctrl, FF5), and CTAR(r_f, FF3) and CTAR(r_f, FF5), or calendar time abnormal returns, are the intercept term of the adjusted and original Fama-French three-factor (FF3) and five-factor (FF5) models of the form defined in equations (3) and (4), respectively, estimated using weighted least squares (WLS). The t-values below abnormal returns are obtained as follows: ASR and BHAR t-values are defined in equations (5) and (7), respectively, and CTAR t-ratios are related to the intercepts of their respective regressions. In BHAR if a stock is delisted, it is assumed to earn zero interest until the end of the holding period. Superscripts represent significance levels for two-tailed t-tests as follows: $^{*} = 0.10$, $^{**} = 0.05$, and $^{***} = 0.01$.

Panel A: Post event 1980–2015								
	RSPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-4.01***	-2.39***	-1.83***	-1.08***	-0.73***	-0.61***	-0.63***	-0.50***
t-val	-9.25	-5.56	-6.31	-6.21	-5.46	-6.13	-7.18	-6.42
BHAR(%)	-8.61***	-4.05***	-5.70***	-8.85***	-5.90**	-3.96	-8.30	3.35
t-val	-10.12	-4.57	-4.95	-4.83	-2.19	-0.85	-1.52	0.45
CTAR(ctrl, FF3)(%)	-8.59***	-4.53***	-2.84***	-1.71***	-0.95***	-0.72***	-0.75***	-0.54***
t-val	-8.87	-4.63	-4.18	-4.71	-3.14	-3.26	-3.97	-3.21
CTAR(ctrl, FF5)(%)	-8.72***	-4.59***	-2.75***	-1.59***	-1.13***	-0.87***	-0.87***	-0.63***
t-val	-7.83	-4.23	-3.49	-3.42	-3.11	-3.19	-3.83	-3.24
CTAR(r_f, FF3)(%)	-8.46***	-3.52***	-2.29***	-1.45***	-0.78**	-0.58**	-0.64***	-0.50**
t-val	-9.26	-4.65	-4.10	-3.98	-2.19	-2.23	-2.67	-2.20
CTAR(r_f, FF5)(%)	-8.42***	-2.96***	-1.66**	-0.75	-0.28	-0.12	-0.19	-0.12
t-val	-7.55	-3.27	-2.29	-1.61	-0.63	-0.37	-0.66	-0.46
Obs (BHAR)	1,521	1,504	1,504	1,504	1,504	1,504	1,504	1,504
Obs (CTAR)	390	391	412	427	427	427	427	427
N of Months	1,475	1,476	2,897	8,102	14,576	24,434	31,356	40,146
N of Clusters	390	391	412	427	427	427	427	427
Panel B: Post event 1980–2002								
	RSPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-4.59***	-2.67***	-1.82***	-0.87***	-0.50***	-0.42***	-0.48***	-0.39***
t-val	-8.13	-4.87	-4.93	-4.25	-3.09	-3.48	-4.58	-4.20
BHAR(%)	-9.88***	-3.78***	-4.67***	-7.16***	-1.00	-0.46	-1.26	8.00
t-val	-9.17	-3.26	-3.09	-3.06	-0.28	-0.09	-0.19	0.87
CTAR(ctrl, FF3)(%)	-10.10***	-4.03***	-2.29***	-1.33***	-0.43	-0.36	-0.45*	-0.34*
t-val	-8.35	-2.96	-2.60	-2.80	-1.15	-1.30	-1.92	-1.72
CTAR(ctrl, FF5)(%)	-10.58***	-4.24***	-2.28**	-1.47***	-0.77	-0.57	-0.63**	-0.45*
t-val	-7.95	-2.88	-2.26	-2.74	-1.61	-1.59	-2.06	-1.78
CTAR(r_f, FF3)(%)	-10.35***	-2.93***	-1.74**	-1.41***	-0.54	-0.43	-0.45	-0.37
t-val	-8.59	-2.94	-2.39	-2.93	-1.19	-1.32	-1.53	-1.35
CTAR(r_f, FF5)(%)	-10.64***	-2.25*	-0.93	-0.85	-0.08	0.08	0.07	0.12
t-val	-7.65	-1.94	-0.98	-1.51	-0.13	0.18	0.16	0.32
Obs (BHAR)	1,011	995	995	995	995	995	995	995
Obs (CTAR)	242	243	258	277	283	295	307	331
N of Months	969	970	1,900	5,319	9,622	16,143	20,772	26,832
N of Clusters	242	243	258	277	283	295	307	331

Table 9, Continued

Panel C: Subperiod 2003–2012								
	RSPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-2.55***	-1.38*	-1.37***	-1.14***	-0.94***	-0.84***	-0.79***	-0.58***
t-val	-3.41	-1.73	-2.60	-3.20	-3.62	-4.40	-4.69	-4.10
BHAR(%)	-6.33***	-3.98***	-6.27***	-8.94***	-10.88**	-3.31	-14.60	6.08
t-val	-4.19	-2.61	-3.20	-2.71	-2.44	-0.28	-1.27	0.36
CTAR(ctrl, FF3)(%)	-6.20***	-4.79***	-3.28***	-1.99***	-1.49***	-1.11***	-1.08***	-0.68**
t-val	-3.81	-3.03	-2.81	-2.92	-2.78	-2.84	-3.50	-2.43
CTAR(ctrl, FF5)(%)	-6.32***	-4.70**	-2.99**	-1.89**	-1.38**	-0.96**	-0.88**	-0.53*
t-val	-3.49	-2.44	-2.12	-2.23	-2.30	-2.06	-2.45	-1.66
CTAR(r_f, FF3)(%)	-5.64***	-3.97***	-2.63***	-1.20*	-0.90*	-0.59	-0.77**	-0.57*
t-val	-3.93	-2.99	-2.68	-1.87	-1.70	-1.40	-2.15	-1.69
CTAR(r_f, FF5)(%)	-5.53***	-3.50**	-2.13*	-0.60	-0.44	-0.09	-0.27	-0.18
t-val	-3.39	-2.05	-1.77	-0.83	-0.74	-0.19	-0.68	-0.47
Obs (BHAR)	393	391	391	391	391	391	391	391
Obs (CTAR)	114	114	121	125	131	143	155	155
N of Months	389	389	768	2,175	3,942	6,784	8,938	11,668
N of Clusters	114	114	121	125	131	143	155	155
Panel D: Subperiod 2003–2015								
	RSPLT	Post Event Months						
	Month	1 Month	2 Months	6 Months	1 Year	2 Years	3 Years	5 Years
ASR (×10)	-2.90***	-1.86***	-1.87***	-1.48***	-1.19***	-0.99***	-0.93***	-0.72***
t-val	-4.50	-2.71	-4.06	-4.62	-5.06	-5.71	-6.02	-5.21
BHAR(%)	-6.05***	-4.45***	-7.42***	-11.55***	-15.14***	-10.88	-21.54**	-5.69
t-val	-4.43	-3.34	-4.31	-4.02	-3.99	-1.12	-2.26	-0.42
CTAR(ctrl, FF3)(%)	-5.66***	-5.44***	-4.10***	-2.45***	-1.92***	-1.39***	-1.33***	-0.92***
t-val	-4.00	-4.14	-4.13	-4.08	-3.88	-3.80	-4.48	-3.24
CTAR(ctrl, FF5)(%)	-5.18***	-5.09***	-3.75***	-1.86**	-1.76***	-1.38***	-1.30***	-0.94***
t-val	-2.77	-3.23	-3.09	-1.98	-3.08	-3.16	-3.90	-3.03
CTAR(r_f, FF3)(%)	-4.79***	-4.46***	-3.44***	-1.59***	-1.27***	-0.90**	-1.01***	-0.78**
t-val	-3.77	-3.92	-3.99	-2.94	-2.72	-2.25	-2.86	-2.27
CTAR(r_f, FF5)(%)	-4.13**	-4.03***	-3.02***	-0.59	-0.65	-0.48	-0.62	-0.52
t-val	-2.31	-2.86	-2.84	-0.70	-1.13	-1.04	-1.63	-1.48
Obs (BHAR)	510	509	509	509	509	509	509	509
Obs (CTAR)	148	148	155	155	155	155	155	155
N of Months	506	506	997	2,783	4,954	8,291	10,584	13,314
N of Clusters	148	148	155	155	155	155	155	155

Figure 1: Monthly abnormal standardized returns (ASRs) for M&A, IPO, SEO, DIV, REP, SPLTA, SPLT, and RSPLT corporate events from 1980 to 2015

The plots report monthly averages of abnormal standardized returns (ASRs), $\texttt{ASR}_{it} = \texttt{sr}_{it} - \texttt{sr}^c_{it}$, where $\texttt{sr}_{it} = \log(1 + R_{it})/s_{it}$ is the standardized log return of the event stock, $\texttt{sr}^c_{it} = \log(1 + R^c_{it})/s^c_{it}$ is the standardized log return of the matching control stock, and s_{it} and s^c_{it} standard deviation of the respective log returns computed from the daily returns in month t. Months that have less than 10 trading days available are dropped from the sample. The sample period covers events from January 1980 to December 2015. The standard errors in the $\pm 2\,\texttt{se}$ bands are cross-sectional correlation robust standard errors estimated by clustering over overlapping calendar months. The number of firms in terms of monthly averages (number of clusters in standard errors) vary from 2,079 to 5,326 (331 to 395) for mergers and acquisitions (M&As), from 3,163 to 7,238 (349 to 419) for initial public offerings (IPOs), from 2,763 to 6,569 (363 to 428) for seasoned equity offerings (SEOs), from 484 to 1,148 (238 to 362) for dividend initiations (DIVs), from 5,641 to 15,267 (346 to 409) for share repurchases (REPs), from 2,377 to 4,066 (386 to 410) for slits announcements (SPLTAs), from 2,399 to 4,078 (388 to 411) for splits (SPLTs), and from 318 to 1,224 (204 to 345) for reversed splits (RSPLTs).

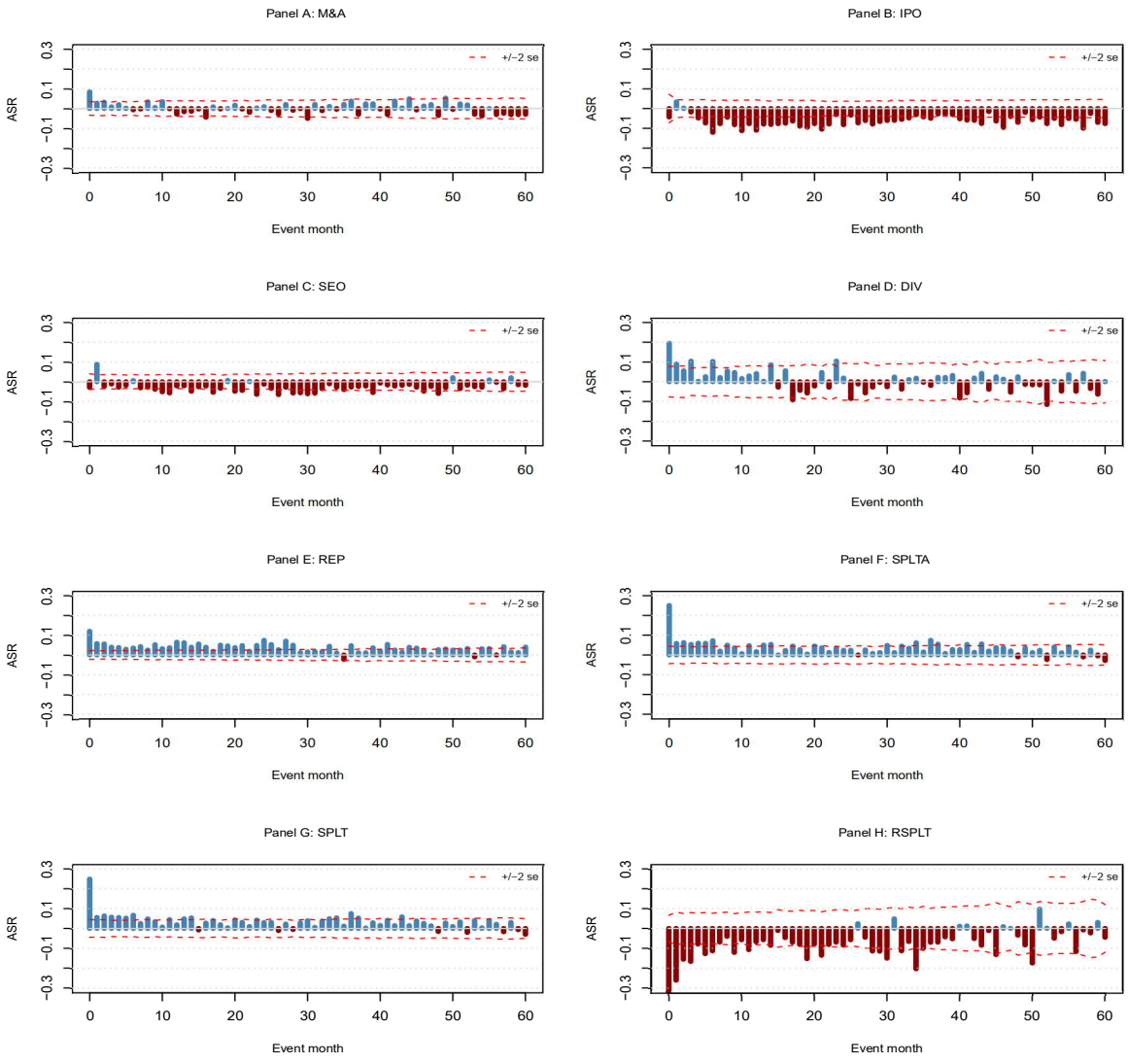

Figure 2: Monthly abnormal standardized returns (ASRs) for M&A, IPO, SEO, DIV, REP, SPLTA, SPLT, and RSPLT corporate events from 1980 to 2002

The plots report monthly averages of abnormal standardized returns (ASRs), $\texttt{ASR}_{it} = \texttt{sr}_{it} - \texttt{sr}^c_{it}$, where $\texttt{sr}_{it} = \log(1 + R_{it})/s_{it}$ is the standardized log return of the event stock, $\texttt{sr}^c_{it} = \log(1 + R^c_{it})/s^c_{it}$ is the standardized log return of the matching control stock, and s_{it} and s^c_{it} standard deviation of the respective log returns computed from the daily returns in month t. Months that have less than 10 trading days available are dropped from the sample. The sample period covers events from January 1980 to December 2002. The standard errors in the $\pm 2\,\texttt{se}$ bands are cross-sectional correlation robust standard errors estimated by clustering over overlapping calendar months. The number of firms in terms of monthly averages (number of clusters in standard errors) vary from 1,452 to 3,414 (235 to 239) for mergers and acquisitions (M&As), from 2,780 to 5,929 (252 to 273) for initial public offerings (IPOs), from 1,926 to 3,875 (267 to 272) for seasoned equity offerings (SEOs), from 284 to 521 (163 to 220) for dividend initiations (DIVs), from 3,791 to 9,167 (250 to 253) for share repurchases (REPs), from 1,920 to 3,336 (271 to 273) for split announcements (SPLTAs), from 1,939 to 3,342 (272 to 274) for splits (SPLTs), and from 175 to 726 (114 to 196) for reversed splits (RSPLTs).

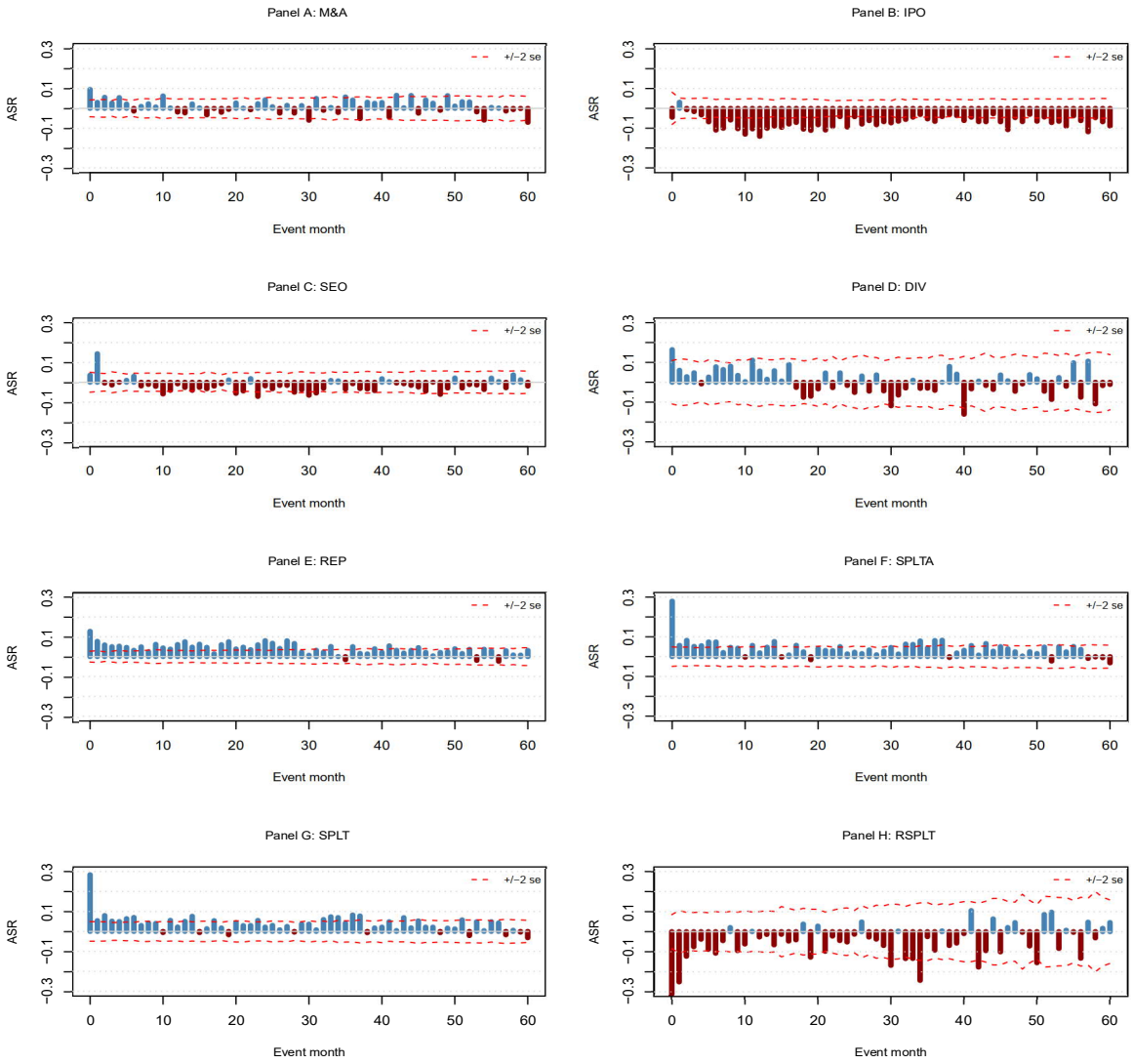

Figure 3: Monthly abnormal standardized returns (ASRs) for M&A, IPO, SEO, DIV, and REP corporate events from 2003 to 2015

The plots report monthly averages of abnormal standardized returns (ASRs), $\texttt{ASR}_{it} = \texttt{sr}_{it} - \texttt{sr}^c_{it}$, where $\texttt{sr}_{it} = \log(1 + R_{it})/s_{it}$ is the standardized log return of the event stock, $\texttt{sr}^c_{it} = \log(1 + R^c_{it})/s^c_{it}$ is the standardized log return of the matching control stock, and s_{it} and s^c_{it} standard deviation of the respective log returns computed from the daily returns in month t. Months that have less than 10 trading days available are dropped from the sample. The sample period covers events from January 2003 to December 2015. The standard errors in the $\pm 2\,\texttt{se}$ bands are cross-sectional correlation robust standard errors estimated by clustering over overlapping calendar months. The number of firms in terms of monthly averages (number of clusters in standard errors) vary from 627 to 1,912 (96 to 156) for mergers and acquisitions (M&As), from 383 to 1,328 (81 to 146) for initial public offerings (IPOs), from 695 to 2,694 (93 to 156) for seasoned equity offerings (SEOs), from 200 to 627 (75 to 143) for dividend initiations (DIVs), from 1,850 to 6,100 (96 to 156) for share repurchases (REPs), from 457 to 730 (115 to 137) for split announcements (SPLTAs), 460 to 736 (116 to 137) for splits (SPLTs), and 140 to 498 (89 to 149) reversed splits (RSPLTs).