Characteristic-Based Expected Returns and Corporate Events

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Abstract

We propose that expected returns estimated for the broad market based on observable firm characteristics provide a simple and useful benchmark for assessing whether returns to a given set of stocks are abnormal. As an important illustration, we document that the apparently abnormal long-run returns after corporate events, including initial and secondary public equity offerings, mergers and acquisitions, dividend initiations, share repurchases and stock splits, are substantially reduced or eliminated when event stock returns are compared to characteristic-based expected returns. A simple five-characteristic specification relying only on firm size, book-to-market ratio, profitability, asset growth, and return momentum performs as well as more complex specifications. This analysis supports the conclusion that returns after corporate events are largely explained by the characteristics of the firms engaging in the events.

Keywords: long-run stock returns after corporate events, buy-and-hold abnormal returns, calendar-time portfolio, expected return, firm characteristics

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1. Introduction

Numerous authors have examined long run returns to firms engaging in important corporate events. One frequently-used method to assess whether returns to these firms are abnormal is to compare long run "buy-and-hold" returns across event firms and control firms selected on the basis of firm characteristics such as market capitalization or market-to-book equity ratio. Another common method is to estimate "calendar time alphas", by regressing returns to a portfolio of event firms on market-based factors motivated by asset pricing models. While conclusions vary somewhat across methods and events, the literature reports considerable evidence of abnormal returns after corporate events.[1]

Each of these methods relies on assumptions regarding normal or benchmark returns. The use of control firms matched on firm characteristics such as size or market-to-book ratio relies on the evidence that these characteristics help to explain average returns in the overall stock market, but also implicitly makes the strong assumption that expected returns to event firms depend *only* on the characteristics used to select control firms. Similarly, calendar time portfolio methods implicitly assume that expected returns to event firms depend *only* on firm sensitivities to the factors employed in the regressions.

In practice, finance researchers have documented that average equity returns are related to a large number of observable variables. Haugen and Baker (1996) demonstrate that a set of forty six observable variables has significant forecast power for next month stock returns. Lewellen (2014) shows for a more recent sample that expected returns derived from cross-sectional regressions using fifteen firm characteristics predict well subsequent month actual returns. Harvey, Liu, and Zhu (2015) report that researchers have collectively documented over

[1] See, for example, Fama (1998), Loughran and Ritter (2000), Kothari and Warner (2007), and Bessembinder and Zhang (2013). We discuss the evidence on long-run stock returns after these events in section 3.1.

three hundred variables with apparently significant explanatory power for the cross-section of stock returns. Green, Hand, and Zhang (2014) report that twenty four "return predictive variables" forecast stock returns in multivariate cross-sectional regressions, each with t-statistics in excess of the 3.0 threshold recommended by Harvey, Liu, and Zhu (2015).

In this paper, we propose and evaluate a simple new approach to assessing whether the average returns realized by a set of securities are abnormal. In particular, we estimate expected returns for the full cross-section of stocks based on commonly-used characteristics. We then assess whether returns to event firms are abnormal, either by comparing event firm realized returns to same-firm characteristic-based expected returns, or by comparing realized returns for event firms to realized returns of control firms with closest characteristic-based expected returns.

To illustrate the method, we compute average abnormal returns over thirty six and sixty month intervals after a set of important corporate events, including initial and secondary public equity offerings, mergers and acquisitions, dividend initiations, share repurchases and stock splits. Using standard methodology from the literature we are able to reproduce the findings of statistically significant abnormal long run event returns, even in our updated sample. However, when we estimate abnormal returns relative to characteristic generated expected returns, we find that abnormal long horizon returns are either greatly reduced or eliminated for all six corporate events.

These results hold for various set of firm characteristics, including the broad set of forty six characteristics studied by Haugen and Baker (1996), the reduced set of fourteen characteristics drawn from Lewellen (2014), and a simple set of only five characteristics (firm size, market-to-book ratio, profitability, momentum, and asset growth) that were used to create

risk factors in important recent asset pricing models including Carhart (1997), Fama and French (2015) and Hou, Xue, and Zhang (2015).

It is important to note that the firm characteristics we rely on have been shown by earlier authors to have explanatory power for the entire cross-section of stocks, not just returns to the event firms we study. Further, our study includes more than twenty years of data subsequent to the period studied by Haugen and Baker (1996) and the key results we report continue to hold in the later sample. Observers may disagree as to whether the statistically significant relations between returns and firm characteristics that we rely upon represent compensation for risk, mispricing, or some form of collective data snooping. Under any of these interpretations, our findings support the conclusion that the apparently abnormal long run returns to firms undergoing the six events we study is largely explained by the firms' observable characteristics and relations between characteristics and returns that apply to the entire market.

Of course, characteristic-based expected returns could not explain returns to event firms absent systematic differences in firm characteristics across event firms and non-event firms. We show that firms that engage in the six corporate events we study indeed differ from other firms in terms of key characteristics. In particular, firms engage in mergers and acquisitions, seasoned equity offerings, share repurchases and stock splits tend to be larger than non-event firms, while IPO firms tend to be smaller. With the exception of firms initiating dividends and share repurchases, event firms tend to have lower book-to-market ratios than non-event firms, and with the exception of firms announcing mergers and acquisitions, event firms tend to have higher recent returns. Firms initiating dividends and those announcing share repurchases and stock splits tend to be more profitable and have lower rates of asset growth, while firms issuing equity

in both initial and secondary offerings tend to have higher levels of asset growth relative to non-event firms.

In addition to showing that the apparently anomalous returns after corporate events are substantially explained by characteristic-based expected returns, we focus attention on a research design issue that can be of first order importance, but is rarely discussed. Tests of whether abnormal returns differ from zero can focus on simple or continuously compounded (log) returns. Most tests using the calendar time portfolio method study simple returns. In contrast, tests that consider "buy-and-hold" returns implicitly focus on continuously compounded returns, because the buy-and-hold return will be equal across an event stock and its matched control stock only if the mean continuously compounded return is equal.

As is well known, the mean simple return to any stock exceeds the mean continuously compounded return as an increasing function of the return variance. We document that the variance of event-stock returns differs significantly from the variance of size-and-book-to-market matched control-stock returns for all six corporate events we study. The implication is that inference with regard to whether event firm returns are abnormal *can be anticipated to differ* depending on whether researchers examine simple returns, as is typical when using the calendar time method, or when using continuously compounded returns, as is implicit when using the buy-and-hold return method. The characteristic-based method introduced here can be used either to model expected simple returns or expected log returns.

The method we propose to assess whether average returns to a set of firms of interest has some inherent advantages compared to alternatives such as measuring BHARs or the calendar time portfolio approach. It can be used to control for as many observable characteristics as desired. The method avoids statistical issues such as skewness and fat tails known to be

problematic for BHAR studies, and can be adapted to provide equal weight to each event (as in the BHAR approach) or equal weight to each time period (as in the calendar time portfolio approach). Perhaps most important, the method is simple to implement, particularly if the set of characteristics is limited to the five (firm size, market-to-book ratio, asset growth, past returns, and profitability) characteristics that we show to work well in our sample.

2. Samples of Corporate Events

To illustrate the potential usefulness of characteristic-based benchmark returns, we consider six important corporate events, each of which has been found to be associated with abnormal post-event long-run stock returns, including mergers and acquisitions (M&As), seasoned equity offerings (SEOs), initial public offerings (IPOs), announcements of dividend initiations, share repurchase announcements, and stock split announcements. Fama (1998) summarizes the sometimes conflicting evidence regarding long-run stock returns after the six events. Bessembinder and Zhang (2013) examine four of these events (M&As, SEOs, IPOS, and dividend initiations), showing that event firms differ from size and market-to-book matched firms in terms of other characteristics, including idiosyncratic volatility, liquidity, and rates of asset growth. The conflicting evidence regarding the existence of abnormal returns in combination with evidence that event firms are unusual in terms of characteristics known to be related to returns motivates our analysis of whether characteristic-based expected returns can explain realized returns after important corporate events.

We obtain data on four of the six events from the SDC database, whose coverage starts in 1980. Therefore, we focus our analysis on the period 1980 to 2014. We identify firms engaging in mergers and acquisitions based on the criteria that the deal must be a merger (SDC form “M”),

acquisition of majority interest ("AM"), acquisition of remaining interest ("AR"), or acquisition of partial interest ("AP"). Also, following Betton, Eckbo, and Thorburn (2008), we require the acquisition to be a control bid, i.e., the acquirer owns less than 50% of the target firm before the acquisition and intends to control the target. In addition, we require that the transaction value must be more than $5 million and that the transaction value must be more than 5% of the acquirer's market capitalization before deal announcement, to exclude small transactions that will not have material impacts on the acquirer. Our sample contains 5,875 such mergers and acquisitions.

Our samples of SEOs and IPOs are also retrieved from the SDC database. Following Eckbo, Masulis, and Norli (2007), we exclude American Depository Receipts, Global Depository Receipts, unit offerings, financial firms (SIC codes between 6000 and 6999) and utilities (SIC between 4900 and 4999) from the sample of SEOs. Real Estate Investment Trusts, closed-end funds, and American Depository Receipts are excluded from the sample of IPOs, following Loughran and Ritter (1995). Our sample includes 10,125 SEOs and 10,438 IPOs.

We identify share repurchases from the SDC merger and acquisition database with deal form of "buyback." SDC might record multiple announcements of the same repurchase from different sources (Banyi, Dyl, and Kahle, 2008). Therefore, we only keep the first announcement if a firm announces multiple share repurchases in the same month. Our sample consists of 22,325 such share repurchase announcements.

We form our sample of dividend initiations following Michaely, Thaler, and Womack (1995) and Boehme and Sorescu (2002). Specifically, we identify cash dividends initiated between 1980 and 2014 from the CRSP daily event file, requiring that the security is common stock (share code 10 or 11) and has been listed in the CRSP database for more than two years,

and that the frequency of cash dividend is monthly, quarterly, semiannual, annual, or unspecified. Our sample contains 1,475 such dividend initiations.

Finally, we identify announcements of stock splits from the CRSP distribution master file, based on distribution code "5523" and a split factor greater than 0.25 (corresponding to a five-for-four split). Our sample contains 11,350 stock splits to common stocks (share code 10 or 11) over the period 1980-2014.

Panel A of Table 1 reports the total number of events in the sample, while Panel B reports the number of events by year. The frequency of events varies significantly over time. For example, the number of M&As ranges between zero in 1983 to 496 in 1998, while that of stock splits ranges between 13 in 2009 and 800 in 1983.

3. Long-run stock returns of event firms relative to matched firms

We first verify that our sample of firms undergoing corporate events display long run returns that appear to be abnormal, as documented by other authors for earlier samples. To do so, we report buy-and-hold abnormal returns (BHARs) measured for event *e* over *T* months after a corporate event at date 0 as:

$$BHAR_{eT} = \prod_{t=1}^{T}(1+r_{et}) - \prod_{t=1}^{T}(1+r_{ct}) = \exp\{\sum_{t=1}^{T}\ln(1+r_{et})\} - \exp\{\sum_{t=1}^{T}\ln(1+r_{ct})\},$$

where r_{et} and r_{ct} are the month t stock returns of the event firm and its matched control firm, respectively. Note that the BHAR for an event firm is zero if the mean log return is equal across the event firm and the control firm, implying that BHAR tests are equivalently tests regarding equality of mean log returns. We also report mean simple and log returns to event and control firms for our sample, as well as differences in return volatility across event and control firms.

We identify matching firms on a monthly basis using methods similar to Loughran and Ritter (1995), Barber and Lyon (1997) and Eckbo, Masulis, and Norli (2000). For events other

than IPOs and SEOs, the matched firm is selected as the firm with the closest book-to-market ratio among firms with market capitalization between 70% and 130% of the event firm. Market capitalization is measured as of the month prior to the deal, while BM is the ratio of the book value of common equity to the market value of common equity at the end of fiscal year *t*-1 before the event.[2] We identify matching firms for our IPO and SEO samples following Loughran and Ritter (1995). Each IPO firm is matched with the firm having the closest but greater market capitalization at the end of December following the IPO. To be included, the matching firm must have been publicly traded for more than three years. For SEOs we identify the matching firm as that with the closest but larger market capitalization at the end of the month before the SEO. We exclude as matching firms that that issue seasoned equities during the prior three years.

We then compare stock returns of event firms to matched firms over the 36 months following each event.[3] In addition to measuring buy-and-hold-abnormal returns (BHARs) over thirty six month periods, we estimate mean differences in log and simple returns over the 36 month horizon by OLS regressions of the monthly difference in stock return between the event firm and its matching firm on a constant, using two specifications. In the first we pool all observations and report the full sample coefficient on the constant. In the second, we conduct cross-sectional (Fama-MacBeth, 1973) regressions each month, and report the time series average of the resulting coefficients.[4]

[2] If the year end of fiscal year *t*-1 is less than four months before the event, BM will be measured at the end of fiscal year *t*-2 before the event. This is to ensure that the BM ratio is known before the event. To be included, the matching firm of a certain event must not be in our sample of the event during the six years around the event date.
[3] The event window is truncated if the event firm delists or conducts a follow-on event of the same type within 36 months. We exclude corporate events after 2011 from the BHAR analysis in order to examine 36-month BHARs. These events are included in all the other analyses.
[4] As stock returns are highly correlated across firms in each month, we follow Petersen (2009) in reporting standard errors clustered by time for the pooled regressions.

The two methods differ only in the weights used to compute the means, as the pooled regressions place equal weight on each event while the Fama-MacBeth regressions effectively place less weight on observations that occur in periods with more events. Corporate events tend to cluster over time, possibly as a result of firms' efforts to time the market. Loughran and Ritter (2000) propose that tests that weight events equally are more likely to detect abnormal performance than tests that weight periods equally. We present both pooled and Fama-MacBeth regression results to assess robustness of results with regard to the issue.

3.1 Differences in BHARs and log returns

In the left column of Table 2 we report average BHARs for each of the six events. Consistent with the earlier literature and as discussed further below, these differ significantly from zero for all events. BHARs are negative for firms engaging in mergers and acquisitions (-14.2% over the 36 months, with a t-statistic of -7.7), seasoned equity offerings (-22.7% over the 36 months, with a t-statistic of -16.1), and initial public offerings (-44.8% over the 36 months, with a t-statistic of -24.1). BHARs are positive for firms initiating dividends (17.3% over the 36 months, with a t-statistic of 4.8), announcing share repurchases (10.8% over the 36 months, with a t-statistic of 14.4), and stock splits (23.1% over the 36 months, with a t-statistic of -21.5).

Bessembinder and Zhang (2013) note that while a test of whether mean log returns are equal across event and control firms is equivalently a test of whether BHARS are zero, BHARs are skewed and have fat tails, making statistical inferences less reliable, as documented by Barber and Lyon (1997), Lyon, Barber, and Tsai (1999) and Mitchell and Stafford (2000). In the second and third columns of Table 2 we report mean differences in log returns across event and control firms, by the pooled and Fama-MacBeth methods, respectively.

The mean log return for firms announcing mergers and acquisitions is lower than for control firms by 0.48% per month (t-statistic = -4.54) in the pooled specification and by 0.32% (t-statistic = -3.47) in the Fama-MacBeth specification. A finding of long term underperformance regression for this sample is consistent with Loughran and Vijh (1997), Rau and Vermaelen (1998), and Betton, Eckbo, and Thorburn (2008). Firms engaging in SEOs have mean log returns that are 0.86 percent per month lower than control firms (t-statistic = -5.11) by the pooled method and 0.66% per month less by the Fama-MacBeth method. Finding negative abnormal long run returns for firms engaging in SEOs is consistent with Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), Jegadeesh (2000), and Eckbo, Masulis, and Norli (2007).

For the IPO sample, the mean log return is 1.33% per month lower (t-statistic = -5.38) than for matched firms in the pooled sample and 1.07% lower by the Fama-MacBeth method (t-statistic = -4.12). That is, the IPO firms underperform their matching firms by more than 40% over the three years after IPO, a result consistent with prior studies including Loughran and Ritter (1995) and Eckbo, Masulis, and Norli (2007).

In contrast, the evidence indicates higher returns to event firms for dividend initiations, share repurchases and stock splits. For the sample of dividend initiations the mean log returns is higher by 0.52% and 0.63% by the pooled and Fama-MacBeth methods (t-statistics equal to 4.96 and 4.82, respectively). For firms that engage in share repurchases the average log return exceeds that of the control firm by 0.47% and 0.37% per month by the equal-weighted and Fama-MacBeth methods (t-statists equal to 6.32 and 5.54), while for the stock split sample the mean log return to the event firm exceeds that to the control firm by 0.81% and 0.63% per month by the equal-weighted and Fama-MacBeth methods (t-statistics equal to 10.89 and 8.59).

Finding positive abnormal long run returns to firms initiating dividends is consistent with Michaely, Thaler, and Womack (1995) and Boehme and Sorescu (2002), while our results with respect to share repurchases are consistent with Ikenberry, Lakonishok, and Vermaelen (1995) and Peyer and Vermaelen (2009). Finding positive abnormal returns after stock splits is consistent with Ikenberry, Rankine, and Stice (1996), Desai and Jain (1997), and Ikenberry and Ramnath (2002).

The results for BHARs and mean log returns reported on Table 2 show that we replicate in our updated sample the key findings from the prior literature. In particular, long run abnormal returns appear to be negative for firms engaging in M&As, IPOs, and SEOs, while long run abnormal returns appear to be positive for firms engaging in dividend initiations, share repurchases, and stock splits.

3.2 Differences in return volatility across event and matched control firms, and the use of mean simple returns to assess performance

We also report on Table 2 the average difference in the standard deviation of monthly returns for event firms vs. their matched control firms in the thirty six months after corporate events. While many researchers, including those referenced in the prior section, study BHARs after corporate events, others have studied simple returns, most often while implementing the calendar time portfolio method.[5] The research design choice to study simple versus log returns will be potentially important to the conclusions drawn when return volatilities differ across event and control firms.

The results on Table 2 indicate that returns to event firms are more volatile than returns to control firms in the cases of M&As, SEOs, and IPOs, while event firm returns are less volatile

[5]See, among others, Boehme and Sorescu (2002), Ikenberry and Ramnath (2002), Eckbo, Masulis, and Norli (2007), Betton, Eckbo, and Thorburn (2008), and Peyer and Vermaelen (2009).

than control firm returns in the cases of dividend initiations, share repurchases and stock splits. The differences in return volatilities across event and control firms are especially large for SEOs (3.56% per month) and IPOs (4.80% per month).

As is well known, mean simple returns exceed mean log returns as a positive function of return variances. The larger return volatilities for event firms in the cases of M&As, SEOs, and IPOs therefore imply that these event firms will perform better relative to control firms when the focus is on simple as compared to log returns. Since these are firms with negative average BHARs, the implication is that measured abnormal returns will be less negative or potentially even positive when researchers study simple returns after M&As, SEOs, and IPOs. In contrast, the smaller return volatilities for event firms in the cases of dividend initiations, share repurchases and stock splits imply that these firms will perform worse relative to control firms when the focus is on simple returns rather than log returns. Since these are firms with positive average BHARs, the implication is that measured abnormal returns will be less positive or potentially even negative when researchers study simple returns after dividend initiations, share repurchases and stock splits.

Differences in mean simple returns across event and control stocks, also reported on Table 2, confirm this simple reasoning. The statistically and economically significant underperformance of M&A, SEO, and IPO firms apparent when focusing on log returns is reduced or eliminated when comparing average simple returns. For example, the pooled sample difference in log returns for SEO firms is -0.86% per month, while the corresponding pooled sample difference in mean simple returns is -0.29% per month, with a marginally significant t-statistic of -1.74. The pooled sample difference in average log returns is -1.33% per month for

IPO forms, compared to a corresponding difference in average simple returns of 0.41% per month, with a marginally significant t-statistic of -1.76.

Similarly, the economically and statistically significant positive abnormal returns to firms engaging in dividend initiations, share repurchases and stock splits observed when focusing on log returns is diminished or eliminated when focusing on simple returns. For example, the pooled mean difference in log returns for firms initiating dividends is 0.52% per month, as compared to a statistically insignificant 0.14% per month when focusing on average simple returns.

We do not take a stance as to whether researchers should study simple or log returns when assessing abnormal performance. Rather, our intent is to demonstrate that, since event firms tend to differ significantly from other firms in terms of return volatility, conclusions regarding the existence of abnormal returns *can be anticipated to differ* depending on the choice to study simple returns, as is typical in calendar time portfolio studies, versus log returns, as is implicit in studies that compute BHARs. Further, we demonstrate below how our proposed characteristic-based benchmarks can be adapted to either simple or log returns.

4. Firm Characteristics and Expected Stock Return

We propose an alternative method to assess whether long-run returns to a set of stocks of interest are abnormal. We exploit the fact that returns are known to be related to a set of observable firm characteristics. In particular, we estimate expected returns on a monthly basis by simple cross-sectional regressions of returns on characteristics measured as of the prior month. We then assess whether returns are abnormal both by comparing realized returns to characteristic-based expected returns for event stocks, and by comparing realized returns across

event stocks and control stocks selected based on similarity of the characteristic based expected returns. For researchers who prefer to study log returns the comparison is of actual log returns to expected log returns (or matching based on expected log return), while for researchers who prefer to study simple returns the comparison is of actual simple returns to expected simple returns (or matching based on expected simple return).

Our proposed approach is similar in intent to the use of control firms that are matched to event firms based on firm characteristics. However, Bessembinder and Zhang (2013) document that event firms often differ significantly from other firms in terms of several characteristics. Attempts to match event and control firms in multiple dimensions are likely to lead to poor match quality as the number of matching characteristics increases. Our proposed method allows controls for differences between event and non-event firms in numerous characteristics, captured through a single metric, the characteristic-based expected return for the firm and month.

4.1 Firm characteristics that predict stock return

Haugen and Baker (1996) document that a set of forty six observable characteristics contains significant explanatory power for one-month ahead returns. We confirm this finding for our updated sample period, and also show that expected returns based on these characteristics can successfully explain the apparent abnormal returns to event firms. However, in the interest of parsimony, we also consider smaller sets of characteristics, including fourteen characteristics selected based on the evidence reported by Lewellen (2014), and a set of only five characteristics selected based on their prominence in recent asset pricing research.

The forty six characteristics studied by Haugen and Baker (1996) relate to firm risk, liquidity, stock price level, firm growth potential, and prior stock returns. We provide in Appendix B detailed definitions of the characteristics. We also consider a reduced set of

fourteen characteristics, drawn from the fifteen studied by Lewellen (2014). The exception is that we do not include stock issuance as a variable to estimate expected returns, because we intend to evaluate long-run stock returns after equity offerings. Appendix A defines the fourteen firm characteristics in detail. Lewellen shows that these firm characteristics successfully predict future stock returns.

In addition, we study a subset of only five firm characteristics: firm size, book-to-market ratio, stock returns over the prior twelve months, profitability as measured by Return on Assets (ROA), and the firm's rate of investment as measured by year-on-year growth in total assets. Note that these characteristics correspond to the risk factors in the recently proposed asset pricing models of Fama and French (2015) and Hou, Xue, and Zhang (2015), except that we include momentum based on the evidence in Carhart (1997) and subsequent studies, and exclude the market return. For brevity we refer to the forty six Haugen and Baker (1996) characteristics as the C46 model, to the fourteen characteristics drawn from Lewellen (2015) as the C14 model, and to the reduced set of five characteristics as the C5 model.

One advantage of the Haugen and Baker C46 variables is that their forecast power for the cross-section of stock returns was first documented in data spanning 1979 to 1993. Thus, the success of the C46 in forecasting returns even in the second half of our sample indicates that the results are unlikely to be attributable to collective data snooping.

Finally, for comparison, we consider expected returns that are estimated based on the betas (factor sensitivities) from the widely-studied four factor model of Fama and French (1993) and Carhart (1997), FFC hereafter, the Fama and French (2015) five-factor model, FF5 hereafter, and the Hou, Xue, and Zhang (2015) four-factor model, HXZ hereafter.[6]

[6] To address the errors-in-variables issue inherent in using estimated factor loadings to explain returns, we estimate factor loadings on a portfolio basis. Using the FFC model as an example, for each month *t*, we regress firm stock

Table 3 presents summary statistics regarding the firm characteristics, each measured on a monthly basis. Following Lewellen (2014), we winsorize each firm characteristic at the upper and lower 1% level in each month. Also following Lewellen (2014), we exclude firm months with missing firm size, book-to-market ratio, stock return momentum, ROA, or investment rate from analyses based on the C5 or C14 model, and exclude firms months with missing firm size, book-to-price ratio, momentum stock return over the prior 12 months, or ROA from analyses based on the C46 model. We focus on the period from January 1970 to December 2014 because our corporate event samples start in 1980 and we require ten years of data to estimate stock returns.[7]

4.2 Expected stock returns

We estimate expected stock returns for each firm/month following the method of Haugen and Baker (1996) and Lewellen (2014). For each month *t*, we estimate a cross-sectional regression of firm stock returns on firm characteristics measured as of the end of month *t*-1. Stocks with missing firm characteristics are excluded from the regression. We then compute the average coefficient on each firm characteristic over the previous 120 months, and estimate the expected stock return in month *t* based on firm characteristics at the end of month *t*-1 and the average coefficients over months *t*-1 to *t*-120.[8] In order to make coefficients on firm characteristics comparable across characteristics and time, we normalize each firm characteristic

returns in excess of the risk free interest rate on the four factors (MKT, SMB, HML, and UMD) over months *t*-1 to *t*-60. We then assign firms into 100 portfolios based on each of the four estimated factor loadings. For each of the 100 market-beta-sorted portfolios, we estimate factor loadings by a regression of portfolio returns in excess of the risk free rate on the four factors over months *t*-1 to *t*-60. Each firm is then assigned the factor loading for the portfolio to which it belongs. As Fama and French (1992) show, this two-step procedure helps to reduce measurement errors in factor loadings.

[7] There are two exceptions. The Haugen-Baker 46 characteristics are not available until 1978, and loadings on the HXC four factors are not available until 1972. We thank Kewei Hou, Chen Xue, and Lu Zhang for sharing their risk factor data.

[8] For a stock with missing firm characteristics in month *t*-1, we assign the sample mean of the firm characteristic in month *t*-1 to the stock when estimating the stock return in month *t*.

in each month by subtracting the cross-sectional mean and dividing by the cross-sectional standard deviation. That is, all firm characteristics have mean of zero and variance of one. Expected returns are estimated using both simple and log returns for each firm.

Table 4 presents average coefficients on the firm characteristics over the period January 1970 to December 2014. Panel A of Table reports on the 5-characteristic and 14-characteristic models. In column (1), we observe that all characteristics in the C5 model are significantly associated with next-month ahead stock simple returns. Simple stock returns are negatively associated with firm size and investment outlays, and positively associated with BM ratio, 12-month momentum return, and ROA. In column (3) we observe similar results for log returns, except that log returns are positively rather than negatively related to firm size.
Column (2) of Table 4 Panel A presents average coefficients on the C14 characteristics when forecasting simple returns. The C5 characteristics have the same sign as in column (1) and remain statistically significant. Six of the additional nine characteristics (accruals, long run prior returns, idiosyncratic risk, illiquidity, leverage, and sales to price ratio) are also statistically significant, while the coefficients on three characteristics (market beta, dividend payout, and turnover rate) are insignificant. Column (4) reports corresponding results obtained when forecasting log returns. These are generally similar, except that long run prior returns are not significant in forecasting log returns, while the turnover ratio is significant.

Panels B and C of Table 4 reports average coefficients obtained when focusing on simple and log returns, respectively, for the forty six firm characteristics of Haugen and Baker (1996), supplemented by ten industry indicator variables also employed by them. Approximately half of the individual coefficients are significant, and the adjusted R-squared statistics of .075 for simple returns and .085 for log returns are higher than corresponding statistics for the C5 and C14

models. While the C46 model is obviously more difficult to implement as compared to the C5 and C14 models, these higher R-squared statistics hold out the promise that the C46 model may be more effective.

Panel D of Table 4 presents average coefficients obtained when returns are regressed on factor loadings estimated based on the FFC, FF5, and HXZ risk factors. Focusing on simple returns, only the momentum beta is significant among the FFC factors. The BM beta and the investment beta are significant when implementing the FF5 model, while none of the betas from the HXZ model are significant in forecasting simple returns. Focusing on log returns, betas on the overall market and the firm size factor have significant forecast power. However, the estimated coefficients are negative, which is at odds with interpretations based on asset pricing theory. In contrast, the estimated coefficient on the BM beta is positive and significant when forecasting log returns.

On balance, these results verify that the C5, C14, and C46 characteristics have statistically significant forecast power for stock returns in our sample. The results indicate that factor loadings from the FFC, FF5, and HXZ models have forecast power for log returns if not simple returns, though not necessarily in the direction envisioned by asset pricing theory.

4.3 Do expected returns forecast actual returns?

We next assess the extent to which expected returns as described in the preceding section are successful in predicting actual returns. To do so, we first estimate cross-sectional regressions of actual returns on expected returns, on an individual stock basis. Results are reported on Panels A (simple returns) and B (log returns) of Table 5. Ideal forecasts would yield a slope coefficient of one and an intercept equal to zero.

Focusing first on simple returns, estimated slope coefficients from the C5 and C14 models are 0.86 and 0.82 respectively, while the estimated slope coefficient from the C46 model is 0.62. The estimated slopes for the C5 and C14 models are similar to those of Lewellen (2014) as reported on his Table 3. Each slope coefficient differs significantly from zero, indicating significant forecast power, but each also differs significantly from one. None of the associated intercepts is statistically different from zero. We conclude that the characteristic-based models are quite successful in forecasting simple returns, and that the simpler C5 and C14 models perform slightly better than the C46 model.

In contrast, expected returns based on factor loadings have no forecast power for simple returns. Estimated slope coefficients for each of the FFC, FF5, and HXZ models are statistically indistinguishable from zero. Out finding that expected returns derived from asset pricing models are not successful in predicting subsequent realized returns for individual stocks is consistent with the results reported by Simin (2008).

All of the models show greater success in forecasting log returns. Estimated slope coefficients when regressing actual log returns on expected log returns are 1.03, 1.04, and 0.86 for the C5, C14, and C46 models, respectively. None of the three coefficients differ significantly from the benchmark of one. In contrast to results for simple returns, the factor-based models have some success in forecasting log returns to individual stocks. Estimated slope coefficients are 0.73, 0.89, and 0.89 for the FFC, FF5, and HXZ models, respectively.

To further asses the usefulness of these models in forecasting returns, we sort stocks into decile portfolios based on expected returns from each model, and then computed average realized returns on both an equal and value-weighted basis for each portfolio.[9] Results for equal-

[9] Equal weighted means are adjusted for biases attributable to microstructure noise using the RW method of Asparouhova, Bessembinder, and Kalcheva (2013).

weighted returns to portfolios formed based on predicted simple returns are on Panel B of Table 5, while value-weighted returns are reported on Panel C. Panels D and E report corresponding results when stocks are assigned to portfolios based on expected log returns.

These results confirm that the characteristic-based models succeed in forecasting returns. The spread in realized returns for the highest expected return decile versus the lowest decile is always positive and statistically significant for the characteristic-based models. In Panel B for equal-weighted returns, the spread ranges from 3.13% per month for the C46 model to 2.63% per month for the C5 model. In Panel C for value-weighted returns the spread ranges from 1.42% for the C14 model to 0.97% for the C46 model.

In contrast, the factor-based expected returns fail to explain the spread in realized returns across portfolios. The spread between the realized return on the high and low expected return portfolio is negative rather than positive for each model on Panels B and C of Table 5. On Panels D and E where stocks are sorted based on expected log returns the spread is positive, but is always economically small and never statistically significant.

We conclude from this analysis that the characteristic-based models have considerable empirical success in predicting stock returns. In contrast, the factor based models have limited success predicting returns to individual stocks and essentially no success in predicting portfolio returns. As a consequence we focus on the characteristic-based models for subsequent analyses. We next turn to the central issue addressed in this paper, whether expected returns derived from the characteristic-based models can explain returns in the months after corporate events.

5. Firm Characteristics and Abnormal Returns After Corporate Events

5.1 Differences in firm characteristics for event vs. non-event firms

The results reported in Section 4 verify that characteristic-based models have explanatory power in the full cross section of stocks. We are interested in assessing whether characteristic-based expected returns can help to explain the apparently abnormal returns in the months after firms engage in important corporate events. For this explanation to be plausible, it must be the case that firms engaging in these events differ systematically from other firms in characteristics that are important in determining expected returns.

To assess whether this is the case, we report on Table 6 the average difference in the C5 characteristics over the thirty six months after the indicated event between firms that engage in each event and common stocks contained in the CRSP database that did not engage in the event. We normalize the characteristics by subtracting the mean and dividing by the standard deviation each month, so that each normalized characteristic has mean zero and standard deviation one for the full set of common stocks.

The results indicate that event firms do differ significantly from the broader set of stocks. In particular, firms engaging in mergers and acquisitions, seasoned equity offerings, share repurchases and stock splits tend to be larger than non-event firms, while IPO firms tend to be smaller. With the exception of firms initiating dividends and share repurchases, event firms tend to have lower book-to-market ratios than non-event firms, and with the exception of firms completing mergers and acquisitions, event firms tend to have higher recent returns. Firms initiating dividends and those announcing share repurchases and stock splits tend to be more profitable and have lower asset growth, while firms issuing equity in both initial and seasoned offerings tend to have higher rates of asset growth relative to non-event firms. These results are

consistent with prior studies. For example, Brav, Geczy, and Gompers (2000) show that firms have low BM ratios at the time of seasoned and initial equity offerings, and that IPOs are small firms. Lyandres, Sun, and Zhang (2008) show that both SEO and IPO firms invest more than other firms. Levi, Li, and Zhang (2010) find that larger firms are more likely to initiate acquisitions.

5.2 Characteristic based expected returns and realized returns after corporate events

We now turn to the central issue assessed in this paper, whether characteristic-based expected returns can explain the actual returns to event firms in the months following corporate events. Table 7 reports mean differences between realized returns and expected returns to event firms in the thirty six months after each event, for both simple and log returns, for the C5, C14, and C46 models. Panel A provides results for the full 1980 to 2014 sample, while Panels B and C provide subsample results for the 1980 to 1997 and 1998 to 2014 periods, respectively. Results for the latter subperiod are important because they rely on data subsequent to that studied by Haugen and Baker (1996), who first showed that characteristic-based models have predictive power for stock returns. The robustness of results across the early and later subperiods mitigates concerns that the characteristic-based models are adversely affected by collective data snooping biases.

We observe on Table 7 that differences between average realized returns and characteristic-based expected returns are never statistically significant for either the C5 or C14 models, for any of the six corporate events, when focusing on simple or log returns, by either the pooled or Fama-MacBeth methods, in the full sample as well as in both subsamples. The C46 model also successfully explains realized returns to event firms for SEOs, announcements of mergers and acquisitions, dividend initiations, share repurchases and stock splits, for both simple

and log returns and in the full sample as well as both subsamples. The only returns that remain abnormal arise for the C46 model, which does not fully explain log returns to IPO firms in the full sample or the first subsample, where marginally significant abnormal returns persist.[10]

The key conclusion that can be drawn from the results reported on Table 7 is that returns to event firms in the thirty six months after the six corporate events we study are not abnormal relative to characteristic-based expected returns generated by the C5 and C14 models. Stated alternatively, the apparently abnormal long run returns to event firms, including M&A firms, firms issuing equity through IPOs and SEOs, firms initiating dividends, buying back stock, or engaging in stock splits, documented in prior studies can be attributed to the characteristics of the firms engaging in the events and the relations between firm characteristics and returns that apply to the entire stock market.[11]

Authors studying long run returns after corporate events most often consider three year or five year horizons. On Table 8 we report results that correspond to those on Table 7, except that returns are measured over sixty rather than thirty six months after the events. These results support the same conclusion. In particular, realized returns over the sixty months after corporate events do not differ significantly from the C5 and C14 model expected returns for any of the six events, for simple and for log returns, and using both the pooled and Fama-MacBeth methods.

5.3 Matching firms based on expected returns

As noted, a number of authors have assessed whether long run returns to firms engaging in corporate events are abnormal by comparing event firm returns to returns for control firms that

[10] Characteristic-based expected stock returns are not available for about one third of the firm-months for our IPO sample, due to unavailable accounting data. However, differences in log return between IPOs and their size-matched firms remain negative and statistically significant for the firm-months with valid characteristic-based expected returns. That is, our key results are not driven by missing data.

[11] Results reported on Table 7 are based on comparisons of actual simple returns to expected simple returns and actual log returns to expected log returns. In the Internet Appendix we report evidence underscoring the importance of the distinction between simple and log returns. If actual simple returns are compared to expected log returns or vice versa the result is economically large and statistically significant abnormal returns in virtually all cases.

are similar to the event firms in terms of observable characteristics, most often size and market-to-book ratio. In the preceding section we compare actual returns on event firms to expected returns for the same firms derived from characteristic-based models. An alternative approach combining elements of each is to compare actual returns for event firms to actual returns for control firms selected on the basis of similar characteristic-based expected returns.

We assess this alternative approach by identifying for each event firm on a monthly basis the single closest and ten closest firms based on expected return for the month, as implied by the C5, C14, and C46 models. Matches are determined separately for expected simple and log returns. We consider matching on ten firms as opposed to only a single firm under the reasoning that expected returns for any single firm are estimated with error, and that such errors are likely to be reduced by diversification within a portfolio.

Table 9 reports average abnormal returns during the thirty six months after the indicated events, computed as the event firm return less the return on the most closely matched firm. Table 10 reports corresponding results when abnormal returns are computed as event firm return less the return to an equal weighted portfolio of the ten closest match firms.

Several noteworthy results can be observed on Tables 9 and 10, and by comparing the data there to that reported on Tables 2 and 7. First, these results continue to indicate that returns after SEOs and IPOs are not abnormal. Second, the results do indicate statistically significant abnormal returns after mergers and acquisitions, dividend initiations, share repurchases, and stock splits. These significant abnormal returns are of the same sign as in Table 2, negative for M&As and positive for dividend initiations, share repurchases and stock splits. However, the economic magnitude of the abnormal returns is much smaller relative to estimates obtained when comparing event firm returns to returns on control firms identified based on similar

characteristics, as reported on Table 2. For example, the abnormal log returns reported on Table 2 based on the pooled method are -0.48% for mergers and acquisitions, 0.52% for dividend initiations, and 0.81% for stock splits, while the corresponding abnormal returns are -0.23%, 0.19%, and 0.19% per month, respectively, on Table 10.

Third, the fact that results reported on Tables 9 and 10 sometimes indicate statistically significant abnormal returns while corresponding results reported on Table 7 do not is primarily attributable to smaller standard errors, as point estimates of abnormal returns on Tables 9 and 10 are typically closer to zero as compared to corresponding point estimates on Table 7. The smaller standard errors on Tables 9 and 10 are likely attributable to commonality in *unexpected* returns across event firms and matched firms. Finally, we note that point estimates and t-statistics are generally similar across Tables 9 and 10, implying little benefit to the more complex approach of using ten matching firms as opposed to a single matching firm.

We conclude that the alternative method of comparing event firm returns to returns on control firms identified based on similar characteristic-based expected returns leads to measures of abnormal returns that are statistically significant, but economically small, for mergers and acquisitions, dividend initiations, share repurchases, and stock splits. The same method implies the absence of abnormal returns for SEOs and IPOs.

5.4 Which of the C5 characteristics are most important?

The empirical results reported here indicate that most or all of the apparently abnormal long run returns to stocks engaging in corporate events can be explained by characteristic-based expected return models. Further, the simple five characteristic C5 model works as well as the more complex C14 and C46 models. We next provide some evidence by which to gauge the relative importance of the individual C5 characteristics in explaining returns to event firms.

To do so, we estimate regressions where the dependent variable is the actual monthly simple or log return to event firms in the thirty six months after the events, and where the explanatory variables are the expected return obtained based on only a single characteristic, for each of the C5 characteristics in turn. Results are reported on Table 11.

Focusing first on simple returns, the results indicate that the book to market ratio and rate of capital investment are individually useful in forecasting event firm returns, while firm size, return momentum, and profitability are generally not useful as individual characteristics. The expected return based on the book to market ratio is a successful predictor of actual returns for all events except dividend initiations, while the expected return based on asset growth is a successful predictor for all six events.

Focusing on log returns, in contrast, leads to the conclusion that all five characteristics are important. Expected log returns based only on firm size have significant explanatory power for actual log returns for SEOs, IPOs, and share repurchases. Expected log returns based only on book to market have significant explanatory power for all events except dividend initiations. Expected log returns based only on return momentum, profitability, or rate of asset growth individually have significant explanatory power for actual log returns to all six corporate events. We conclude from this analysis that all of the C5 characteristics are useful in predicting returns to event firms, particularly if the researcher chooses to study log returns.

6. Conclusions and Implications for Future Research

We propose a new method for assessing whether average returns for firms of interest are abnormal. The method relies on the fact that average returns to the stock market as a whole are related to a number of observable characteristics. In particular, we propose that abnormal

returns be measured either as the mean difference between actual returns to the firms of interest and characteristic-based expected returns to the same firms, or based on the difference between mean returns to the events of interest and mean returns to control firms selected based on similar characteristic-based expected returns.

We find that a simple set of just five observable characteristics, including firm size, book-to-market ratio, rate of capital expenditure, recent returns, and firm profitability is as effective or more effective than more complex characteristic models in forecasting actual stock returns. We also show that the apparently abnormal long run returns following six important corporate events, including initial and secondary public equity offerings, mergers and acquisitions, dividend initiations, share repurchases and stock splits are either greatly reduced or eliminated when implementing the characteristic-based expected return models, for all six corporate events.

While our results with regard to these six corporate events are important, we view these results as illustrative. The methods proposed here can be implemented in any setting where researchers wish to assess whether returns to firms of interest are abnormal. It should be stressed, however, that the method compares observed returns to characteristic-based benchmarks that are based on empirical regularities, and that may or may not be consistent with theory. As such the method is suited to assessing whether returns to a given set of firms are abnormal in light of their observable characteristics and return patterns that exist in the broad stock market. However, the method does not provide direct evidence of whether returns represent reward for risk or are abnormal with respect to the implications of equilibrium models.

Appendix A: Definition of the C5 and C14 Firm Characteristics

We measure these characteristics following Lewellen (2014). All variables are measured using data from the CRSP stock price files and the Compustat annual data. All accounting data are assumed to be available four months after the fiscal year end.

	Characteristics in the C5 Model
Log Size	Natural log of market capitalization at the end of the prior month.
Log BM	Natural log of the book-to-market ratio at the end of the prior month. Book value is the firm's common equity (Compustat item *ceq*) in the latest annual report. Market value is the firm's market capitalization at the end of the prior month.
Momentum	Cumulative stock returns over months (-12, -2) before the month of interest.
ROA	Income before extraordinary items (*ib*) divided by average total assets (*at*) in the year.
Asset Growth	Natural log of the ratio of total assets (*at*) at the end of the year to total assets at the beginning of the year.
	Additional Nine Characteristics in the C14 Model
Beta	Beta estimated using monthly stock returns over the preceding 60 months. We require a minimum of six data points for the accuracy of the estimation.
Accrual	Change in working capital from the last year minus depreciation and amortization (*dp*), divided by average total assets (*at*) in the year. Working capital equals current assets (*act*) minus cash and short-term investment (*che*) minus current liabilities (*lct*). It is computed following Sloan (1996).
Dividend	Dividends per share over the prior 12 months divided by the price at the end of the prior month.
Log LR Return	Natural log of cumulative stock returns over months (-13, -36) before the month of interest.
Idiosyncratic risk	In each month, we compute the standard deviation of the residual daily stock returns in the Fama and French three factor regression, following Ang, Hodrick, Xing, and Zhang (2006). Idiosyncratic risk is the average standard deviation over the prior 12 months.
Illiquidity	The average daily ratio of absolute stock return to dollar trading volume during the prior 12 months, as defined by Amihud (2002).
Turnover	Average monthly turnover (shares traded divided by shares outstanding) during the prior 12 months.
Leverage	Debt in current liabilities (*dlc*) plus long-term debt (*dltt*), divided by market capitalization at the end of the last month.
Sales/Price	Sales (*sale*) divided by market capitalization at the end of the last month.

Appendix B: Definition of the C46 Firm Characteristics

Following Haugen and Baker (1996), we measure the 46 characteristics using the CRSP monthly stock price file and the Compustat quarterly data. The quarterly accounting data are assumed to be known three months after the quarter end if the earnings report date is missing. The earnings report date is available on large scale since 1963. Many of the 46 characteristics require five years of data. Therefore, we focus on the period from 1978 to 2014 for this set of firm characteristics.

	1. Risk factors
Beta, market	Beta estimated using monthly stock returns over the preceding 60 months. We require a minimum of six data points for the accuracy of the estimation.
APT Beta's	Beta's estimated using monthly stock returns over the preceding 60 months. The explanatory variables are three-month treasury bill interest rate, quarterly GDP growth rate, inflation rate, the yield spread between 10-year government bond and three-month treasury bills, and the yield spread between BAA-rate corporate bond and 10-year government bond. We require a minimum of 12 data points for the accuracy of the estimation.
Stock return volatility	Standard deviation of monthly stock returns in the preceding 60 months.
Idiosyncratic volatility	Standard deviation of the residual monthly stock return from the market model regression over the preceding 60 months.
Earnings risk	Standard deviation of the de-trended earnings per share (*Compustat* item *epspxq*) over the preceding 20 quarters, divided by the average earnings per share over the same period.
Leverage	Total liabilities divided by total asset in the latest quarter, (*dlcq* + *dlttq*)/*atq*.
Leverage trend	Trend of leverage over the preceding 20 quarters.
Interest-income ratio	The ratio of interest payment (*intpny*) to total revenue (*revtq*) in the latest quarter. It takes the value of zero if interest payment is negative and one if total revenue is negative.
Interest-income ratio trend	Trend of interest-income ratio over the preceding 20 quarters.
Earnings to price volatility	Standard deviation of earnings to price ratio over the preceding 20 quarters.
Dividend to price volatility	Standard deviation of dividend to price ratio over the preceding 20 quarters.
Cash flow to price volatility	Standard deviation of cash flow to price ratio over the preceding 20 quarters.

	2. Liquidity factors
Market capitalization	Number of shares outstanding times stock price) at the end of the prior month.
Stock price	Nominal stock price per share at the end of the prior month.
Trading volume	Average ratio of trading volume to market capitalization over the preceding 12 months.
Trading volume trend	Trend of trading volume over the preceding 60 months.
	3. Factors indicating price level
Earnings to price	Aggregate net income (*niq*) over the latest four quarters divided by market capitalization at the end of the latest quarter *(prccq*cshoq).*
Earnings to price trend	Trend of earnings to price ratio over the preceding 20 quarters.
Book to price	The ratio of common equity to market capitalization in the latest quarter: *ceqq*/(*prccq*cshoq*).
Book to price trend	Trend of book to price ratio over the preceding 20 quarters.
Dividend to price	Aggregate dividend payment (*dvpspq*) over the latest four quarters divided by market price per share at the end of the latest quarter (*prccq*).
Dividend to price trend	Trend of dividend to price ratio over the preceding 20 quarters.
Cash flow to price	Aggregate cash flow (*niq+dpy*) over the latest four quarters divided by market capitalization at the end of the latest quarter (*prccq*cshoq*).
Cash flow to price trend	Trend of cash flow to price ratio over the preceding 20 quarters.
Sales to price	Aggregate sales (saleq) over the latest four quarters divided by market capitalization at the end of the latest quarter (*prccq*cshoq*).
Sales to price trend	Trend of sales to price ratio over the preceding 20 quarters.
	4. Factors indicating growth potential
Profit margin	Average profit margin (*niq/saleq*) in the latest four quarters.
Profit margin trend	Trend of four-quarter moving average profit margin over the preceding 20 quarters.
Capital turnover	Aggregate sales (*saleq*) divided by average total assets (*atq*) over the latest four quarters.
Capital turnover	Trend of capital turnover over the latest 20 quarters.

trend	
ROA	Aggregate income (*niq*) divided by average total assets (*atq*) over the latest four quarters.
ROA trend	Trend of ROA over the latest 20 quarters.
ROE	Aggregate income (*niq*) divided by average common equity (*ceqq*) over the latest four quarters.
ROE trend	Trend of ROE over the latest 20 quarters.
Earnings growth	Trend of earnings per share (*Compustat* item *epspxq*) over the preceding 20 quarters, divided by the average earnings per share over the same period.
	5. Technical factors
Momentum, *N* months	Buy-and-hold returns over the prior *N* months.
	6. Sector variables
Durables	SIC code from 5000-5099
Nondurables	SIC code from 5100-5199
Utilities	SIC code from 4900-4999
Energy	SIC code from 1200-1399
Construction	SIC code from 1500-1799
Business equipment	SIC code from 3400-3799
Manufacturing	SIC code from 2000-3999
Transportation	SIC code from 4000-4899
Financial	SIC code from 6000-6999
Business service	SIC code from 7300-7399

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Table 1: Number of corporate events

Panel A reports the number of corporate events contained in our sample. The five columns report the number of events retrieved from the original data sources, the number with a valid match on size and book-to-market ratio, and the number for which we can compute the expected return, based on each of the three models discussed in Table 4. Panel B reports the number of events by year from 1980-2014.

Panel A: Number of corporate events

		Match on	Match on expected return		
Event	Initial	size-BM	C5	C14	C46
Merger and acquisition	5,875	5,529	5,516	5,516	5,516
SEO	10,125	9,940	9,591	9,591	9,894
IPO	10,438	8,461	7,868	7,868	8,162
Dividend initiation	1,475	1,275	1,274	1,274	1,270
Share repurchase	22,325	20,829	20,719	20,719	20,781
Stock split	11,350	10,236	10,235	10,235	10,151
Total	61,588	56,270	55,203	55,203	55,774

Panel B: Number of events by year

Year	Merger and acquisition	SEO	IPO	Dividend initiation	Share repurchase	Stock split
1980	1	221	93	33	3	537
1981	9	235	260	32	83	502
1982	1	268	93	12	90	319
1983	0	578	571	25	171	800
1984	6	138	268	25	486	360
1985	81	208	262	28	220	545
1986	109	259	574	38	245	785
1987	105	174	444	43	844	579
1988	102	75	227	55	345	246
1989	111	132	196	70	634	343
1990	78	103	180	47	931	206
1991	101	318	368	42	420	289
1992	133	294	537	62	564	445
1993	177	410	696	57	569	522
1994	271	279	511	39	973	361
1995	335	409	514	60	1,042	471
1996	415	512	796	24	1,389	541
1997	420	433	539	34	1,221	511
1998	496	282	345	26	1,762	449
1999	403	341	501	25	1,385	413
2000	390	318	367	21	770	361
2001	249	210	91	17	629	174
2002	161	197	80	26	448	195
2003	180	243	74	114	460	233
2004	210	307	199	78	527	270
2005	199	238	189	57	595	275
2006	194	256	203	45	565	204
2007	234	225	232	35	868	124
2008	150	104	34	17	946	37
2009	87	432	63	26	357	13
2010	110	386	166	51	497	44
2011	101	305	138	54	713	55
2012	29	339	152	59	483	44
2013	87	476	210	53	478	52
2014	140	420	265	45	612	45
Total	5,875	10,125	10,438	1,475	22,325	11,350

Table 2: Differences in stock returns and return volatility between event firms and size-BM matched firms over 36 months after the event

For each event except SEOs and IPOs we identify for each month a matching firm based on prior month size and book-to-market ratio. The matching firm is that with the closest BM ratio among firms with market capitalization between 70% and 130% of the event firm. For SEOs we identify the matching firm as that with the closest but greater market capitalization at the end of the prior month. For IPOs the matching firm is that with the closest but greater market capitalization at the end of December following the IPO. Column (1) presents the 36-month buy-and-hold abnormal returns of the event firm relative to its matching firm. Columns (2)-(3) report the estimated intercept in pooled or Fama-MacBeth regressions, where the dependent variable is the difference in simple between the event firm and the matching firm over the 36 individual months following each event. Column (4) reports the estimated intercept in pooled regressions where the dependent variable is the difference between the event firm and the matching firm in standard deviation of stock return over the 36 months following the event. Columns (5)-(6) report the estimated intercept in pooled or Fama-MacBeth regressions, where the dependent variable is the difference in log return between the event firm and the matching firm over the 36 individual months following each event. T-statistics are in parentheses. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

		Difference in log return		Difference in	Difference in simple return	
	BHAR	Pooled	FM	std. dev.	Pooled	FM
	(1)	(2)	(3)	(4)	(5)	(6)
M&A	-14.21***	-0.48***	-0.32***	1.26***	-0.23**	-0.16*
	(-7.71)	(-4.54)	(-3.47)	(42.92)	(-2.08)	(-1.75)
SEO	-22.68***	-0.86***	-0.66***	3.56***	-0.29*	-0.12
	(-16.08)	(-5.11)	(-4.12)	(162.87)	(-1.74)	(-0.74)
IPO	-44.82***	-1.33***	-1.07***	4.80***	-0.41*	-0.26
	(-24.07)	(-5.38)	(-5.18)	(188.99)	(-1.76)	(-1.35)
Div. ini.	17.29***	0.52***	0.63***	-2.34***	0.14	0.21
	(4.79)	(4.96)	(4.82)	(-52.27)	(1.29)	(1.51)
Share rep.	10.84***	0.47***	0.37***	-1.72***	0.15*	0.13*
	(14.42)	(6.32)	(5.54)	(-100.52)	(1.90)	(1.88)
Stock split	23.10***	0.81***	0.63***	-1.60***	0.56***	0.41***
	(21.46)	(10.89)	(8.59)	(-102.36)	(7.29)	(5.35)

Table 3: Summary statistics of firm characteristics

This table reports summary statics regarding the firm characteristics that we employ to predict stock returns. It includes all firm-months from January 1970 to December 2014 (except Panel C). In each month, firm characteristics are winsorized at the upper and lower 1% levels. See the Appendix for detailed variable definitions.

Panel A: C5 and C14 characteristics, January 1970 to December 2014

Variable	N	Mean	Std. dev.	5th pctl	25th pctl	Median	75th pctl	95th pctl
Return (%)	2300911	1.2725	17.9669	-22.0536	-6.6667	0.0000	7.3692	26.6875
C5 characteristics								
Log Size	2300911	4.6855	2.1853	1.3122	3.0761	4.5487	6.1813	8.4702
Log BM	2300911	-0.5657	0.9728	-2.3119	-1.1130	-0.4874	0.0642	0.9051
Momentum	2300911	0.1266	0.5882	-0.5971	-0.2109	0.0484	0.3322	1.1028
ROA	2300911	-0.0012	0.1783	-0.3462	0.0006	0.0337	0.0757	0.1621
Investment	2300911	0.1507	0.3587	-0.2457	-0.0047	0.0850	0.2128	0.7926
Additional 9 characteristics in the C14 model								
Beta	2270748	1.1337	0.8135	0.0301	0.6133	1.0505	1.5405	2.5718
Accrual	1954524	-0.0302	0.1139	-0.2055	-0.0811	-0.0331	0.0166	0.1554
Dividend	2300909	0.0144	0.0228	0.0000	0.0000	0.0000	0.0234	0.0632
Log LR Return	2211524	0.0443	0.6844	-1.1896	-0.3029	0.1034	0.4549	1.0697
Idio. risk	2300863	0.0282	0.0185	0.0091	0.0154	0.0232	0.0355	0.0649
Illiquidity	2126247	5.3529	20.6003	0.0005	0.0133	0.1924	1.9927	25.1875
Turnover	2128096	0.0946	0.1355	0.0049	0.0188	0.0466	0.1123	0.3478
Leverage	2285617	0.8388	1.8560	0.0000	0.0417	0.2643	0.8412	3.4893
Sales/Price	2295109	2.5292	4.2524	0.0752	0.4720	1.1447	2.7237	9.6261

Panel B: Beta's, January 1970 to December 2014

Variable	N	Mean	Std. dev.	5th pctl	25th pctl	Median	75th pctl	95th pctl
Fama-French-Carhart 4 factors (FFC)								
Beta, market	2604105	0.9502	0.8639	-0.2762	0.4899	0.9143	1.3652	2.3511
Beta, size	2604105	0.9426	1.3425	-0.7425	0.1676	0.7603	1.5480	3.2808
Beta, BM	2604105	0.1658	1.3733	-2.1262	-0.4651	0.2223	0.8298	2.1890
Beta, momentum	2604105	-0.1021	0.9630	-1.6163	-0.4923	-0.0740	0.3109	1.3683
Fama-French 5 factors (FF5)								
Beta, market	2604105	0.9374	0.9135	-0.3720	0.4767	0.9126	1.3702	2.3905
Beta, size	2604105	0.9001	1.3728	-0.8700	0.1430	0.7429	1.5055	3.2313
Beta, BM	2604105	0.0834	1.9149	-3.0372	-0.7274	0.1621	0.9915	2.8684
Beta, profitability	2604105	-0.2472	2.3830	-4.1944	-1.1560	-0.0559	0.8610	2.9810
Beta, investment	2604105	-0.0248	2.7323	-4.1039	-1.1408	-0.0140	1.0608	3.9891
Hou-Xue-Zhang 4 factors (HXZ)								
Beta, market	2534942	0.9225	0.9118	-0.3743	0.4447	0.8856	1.3524	2.3923
Beta, size	2534942	0.8182	1.3029	-0.8433	0.0735	0.6447	1.3956	3.0645
Beta, profitability	2534942	-0.3688	1.6629	-3.2209	-1.0333	-0.2134	0.4569	1.9062
Beta, investment	2534942	0.0231	1.9452	-3.2456	-0.8516	0.1209	0.9566	2.9951

Panel C: Haugen-Baker (1996) C46 characteristics, January 1978 to December 2014

Variable	N	Mean	Std. dev.	5th pctl	25th pctl	Median	75th pctl	95th pctl
Beta, market	2018019	1.1160	0.8713	-0.0320	0.5672	1.0206	1.5313	2.6703
Beta, T bill	1938761	-0.0169	0.2130	-0.2422	-0.0469	-0.0081	0.0250	0.1784
Beta, GDP growth	1938761	0.6663	5.4821	-5.8301	-1.1708	0.1890	1.7126	8.9393
Beta, inflation	1938761	-0.0825	8.5686	-10.8976	-2.3847	-0.1225	1.8528	11.3562
Beta, term spread	1938761	-0.0147	0.1085	-0.1778	-0.0444	-0.0090	0.0183	0.1260
Beta, risk spread	1938761	0.0389	0.2987	-0.2714	-0.0477	0.0140	0.0836	0.4128
Stock return volatility	2068489	0.1528	0.0860	0.0566	0.0918	0.1326	0.1898	0.3208
Idiosyncratic risk	2068489	0.1395	0.0825	0.0495	0.0806	0.1191	0.1756	0.3015
Earnings risk	2056112	0.0902	5.9171	-6.0043	-0.6665	0.3221	0.9434	5.5627
Leverage	1946188	0.2233	0.2036	0.0000	0.0426	0.1853	0.3487	0.6135
Leverage trend	2058255	-0.0031	0.0234	-0.0335	-0.0059	-0.0001	0.0043	0.0214
Interest-income ratio	2019222	0.1493	0.3389	0.0000	0.0000	0.0000	0.0312	1.0000
Interest-income ratio trend	2063799	0.0049	0.0216	-0.0187	0.0000	0.0000	0.0040	0.0481
Earnings to price volatility	2030855	0.1758	0.5177	0.0077	0.0196	0.0426	0.1216	0.6993
Dividend to price volatility	2032155	0.0052	0.0129	0.0000	0.0000	0.0000	0.0063	0.0211
Cash flow to price volatility	2030855	0.1718	0.4445	0.0101	0.0260	0.0535	0.1331	0.6492
Market capitalization	2071184	1.3289	5.2198	0.0046	0.0273	0.1145	0.5650	5.4773
Stock price	2071184	17.6661	18.2134	0.8402	4.5400	12.3100	24.8600	53.2800
Trading volume	2043305	0.1042	0.1255	0.0085	0.0277	0.0606	0.1305	0.3488
Trading volume trend	2043715	-0.0010	0.0088	-0.0095	-0.0010	0.0000	0.0007	0.0053
Earnings to price	2071184	-0.0583	0.4687	-0.5641	-0.0330	0.0430	0.0799	0.1722
Earnings to price trend	2071184	-0.0054	0.0457	-0.0527	-0.0058	-0.0005	0.0029	0.0275
Book to price	2071184	0.7005	0.6474	0.0680	0.3069	0.5615	0.9215	1.8519
Book to price trend	2071184	0.0045	0.0637	-0.0769	-0.0162	0.0008	0.0207	0.0966
Dividend to price	2071177	0.0116	0.0207	0.0000	0.0000	0.0000	0.0174	0.0558
Dividend to price trend	2071177	0.0001	0.0014	-0.0014	0.0000	0.0000	0.0000	0.0019
Cash flow to price	2071184	0.0442	0.4002	-0.3893	0.0143	0.0814	0.1505	0.3894
Cash flow to price trend	2071184	-0.0017	0.0390	-0.0441	-0.0050	0.0000	0.0058	0.0360
Sales to price	2068918	2.0599	3.2716	0.0544	0.4303	0.9954	2.2625	7.6938
Sales to price trend	2069010	0.0185	0.2371	-0.2223	-0.0245	0.0030	0.0460	0.3105
Profit margin	2045375	-0.7270	5.1658	-1.8182	-0.0333	0.0329	0.0843	0.1968
Profit margin trend	2054754	0.0359	0.6663	-0.0586	-0.0038	0.0000	0.0036	0.1078
Capital turnover	2068918	1.0544	0.8715	0.0581	0.3667	0.9244	1.4934	2.6936
Capital turnover trend	2069010	-0.0065	0.0599	-0.0928	-0.0163	-0.0007	0.0107	0.0606
ROA	2071184	-0.0269	0.2164	-0.4688	-0.0249	0.0238	0.0701	0.1609
ROA trend	2071184	0.0022	0.0322	-0.0260	-0.0040	-0.0001	0.0030	0.0321
ROE	2017497	-0.0608	0.5631	-0.9682	-0.0510	0.0868	0.1591	0.3220
ROE trend	2057310	-0.0117	0.1951	-0.1428	-0.0129	-0.0013	0.0056	0.0847
Earnings growth	2066620	0.0100	0.4778	-0.4925	-0.0579	0.0184	0.0773	0.4940
Momentum, 1 month	2070952	0.0101	0.1607	-0.2311	-0.0688	0.0000	0.0750	0.2740
Momentum, 2 months	2070974	0.0209	0.2306	-0.3219	-0.0979	0.0060	0.1158	0.4000
Momentum, 3 months	2071019	0.0318	0.2874	-0.3853	-0.1200	0.0116	0.1481	0.5000
Momentum, 6 months	2071115	0.0657	0.4267	-0.5100	-0.1667	0.0250	0.2250	0.7627
Momentum, 12 months	2071184	0.1391	0.6505	-0.6451	-0.2300	0.0506	0.3538	1.2082
Momentum, 24 months	2071184	0.2804	0.9557	-0.7604	-0.2943	0.1056	0.5776	1.9247
Momentum, 60 months	2071184	0.762018	1.898863	-0.85537	-0.36364	0.2476	1.181527	4.135399

Table 4: Average coefficients on each firm characteristic across the sample period

In each month, we estimate cross-sectional regressions the firm's simple and log stock returns on its own characteristics measured at the end of the preceding month. This table presents average coefficients across time. Firm characteristics are winsorized within each month at the upper and lower 1%, and are normalized by subtracting the mean and dividing by the standard deviation. See the Appendix for detailed variable definitions. The associated *t*-statistics are reported in the parentheses below/besides each coefficient. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

Panel A: C5 and C14 characteristics, January 1970 to December 2014

	(1)	(2)	(3)	(4)
	C5	C14	C5	C14
Dep. Var.	Simple return		Log return	
Log Size	-0.2274***	-0.2112***	0.2519***	-0.1191**
	(-3.09)	(-4.13)	(3.69)	(-2.43)
Log BM	0.5055***	0.4145***	0.5730***	0.4314***
	(8.94)	(8.99)	(10.83)	(11.01)
Momentum	0.3845***	0.3761***	0.5843***	0.5441***
	(5.84)	(7.40)	(9.45)	(11.50)
ROA	0.0950*	0.1081***	0.5637***	0.3482***
	(1.65)	(2.74)	(10.92)	(9.90)
Investment	-0.3167***	-0.2639***	-0.4148***	-0.3161***
	(-9.55)	(-10.41)	(-11.63)	(-12.71)
Beta		0.0686		0.0124
		(1.29)		(0.24)
Accrual		-0.1047***		-0.1163***
		(-5.17)		(-6.20)
Dividend		0.0052		0.0232
		(0.16)		(0.70)
Log LR Return		-0.1041***		-0.0436
		(-2.92)		(-1.37)
Idio. risk		-0.2464***		-0.8921***
		(-2.96)		(-11.51)
Illiquidity		0.3377***		0.2996***
		(7.38)		(7.66)
Turnover		0.0126		-0.1628***
		(0.28)		(-3.81)
Leverage		-0.1033**		-0.2819***
		(-2.34)		(-7.18)
Sales/Price		0.1588***		0.1198***
		(4.47)		(4.06)
Constant	1.2521***	1.2645***	-0.0305	-0.0122
	(4.87)	(4.81)	(-0.12)	(-0.05)
Adj. R2	0.0345	0.0602	0.0405	0.0683

Panel B: Haugen-Baker (1996) C46 characteristics, January 1978 to December 2014; Simple return

Variable	Coefficient	T-stat	Variable	Coefficient	T-stat
Beta, market	0.0474	(0.98)	Sales to price trend	0.0252	(0.88)
Beta, T bill	0.1259*	(1.85)	Profit margin	0.0315	(1.19)
Beta, GDP growth	-0.0015	(-0.04)	Profit margin trend	-0.0136	(-0.63)
Beta, inflation	-0.0056	(-0.15)	Capital turnover	0.0576*	(1.68)
Beta, term spread	-0.0507	(-0.90)	Capital turnover trend	0.1237***	(6.56)
Beta, risk spread	-0.0476	(-0.87)	ROA	-0.0342	(-0.66)
Stock return volatility	0.2027	(1.25)	ROA trend	0.0014	(0.05)
Idiosyncratic risk	-0.1481	(-1.02)	ROE	0.2092***	(5.80)
Earnings risk	0.0166	(1.21)	ROE trend	-0.0049	(-0.24)
Leverage	-0.2105***	(-7.01)	Earnings growth	0.0092	(0.65)
Leverage trend	0.0515***	(2.76)	Momentum, 1 month	-0.7958***	(-15.99)
Interest-income ratio	-0.1558***	(-7.24)	Momentum, 2 months	-0.4359***	(-8.98)
Interest-income ratio trend	-0.0440**	(-2.19)	Momentum, 3 months	0.0335	(0.69)
Earnings to price volatility	-0.6313***	(-2.97)	Momentum, 6 months	0.0478	(1.10)
Dividend to price volatility	-0.0451***	(-2.86)	Momentum, 12 months	0.4297***	(9.89)
Cash flow to price volatility	0.7050***	(3.38)	Momentum, 24 months	-0.0105	(-0.30)
Market capitalization	-0.0426**	(-2.02)	Momentum, 60 months	-0.0481**	(-2.17)
Stock price	0.0766**	(2.18)	Durables	-0.1880*	(-1.86)
Trading volume	-0.3225***	(-6.04)	Nondurables	-0.0884	(-0.83)
Trading volume trend	-0.0669***	(-3.40)	Utilities	0.0103	(0.08)
Earnings to price	-0.2935**	(-2.46)	Energy	-0.1120	(-0.42)
Earnings to price trend	0.1089	(0.84)	Construction	-0.1605	(-0.99)
Book to price	0.2668***	(7.87)	Business equipment	-0.0052	(-0.07)
Book to price trend	0.0334	(1.43)	Manufacturing	0.1572**	(2.49)
Dividend to price	-0.0469	(-1.46)	Transportation	0.2123*	(1.90)
Dividend to price trend	0.0125	(0.84)	Financial	-0.0780	(-0.80)
Cash flow to price	0.1661	(1.58)	Business services	0.3672***	(3.45)
Cash flow to price trend	-0.1911	(-1.52)	Constant	1.2393***	(4.57)
Sales to price	0.0790*	(1.89)	Adj. R2	0.0745	

Panel C: Haugen-Baker (1996) C46 characteristics, January 1978 to December 2014; Log return

Variable	Coefficient	T-stat	Variable	Coefficient	T-stat
Beta, market	0.1422***	(3.22)	Sales to price trend	-0.0062	(-0.25)
Beta, T bill	0.0924	(1.60)	Profit margin	0.0695***	(3.07)
Beta, GDP growth	0.0018	(0.06)	Profit margin trend	-0.0265	(-1.45)
Beta, inflation	-0.0120	(-0.40)	Capital turnover	0.0638**	(2.03)
Beta, term spread	-0.0535	(-1.12)	Capital turnover trend	0.1216***	(7.04)
Beta, risk spread	0.0007	(0.02)	ROA	0.1639***	(3.75)
Stock return volatility	-0.3586**	(-2.38)	ROA trend	-0.0408*	(-1.77)
Idiosyncratic risk	-0.2043	(-1.50)	ROE	0.2282***	(7.03)
Earnings risk	0.0221*	(1.81)	ROE trend	0.0031	(0.17)
Leverage	-0.2212***	(-7.84)	Earnings growth	0.0081	(0.62)
Leverage trend	0.0396**	(2.35)	Momentum, 1 month	-0.7632***	(-17.66)
Interest-income ratio	-0.1585***	(-8.13)	Momentum, 2 months	-0.3678***	(-8.76)
Interest-income ratio trend	-0.0630***	(-3.34)	Momentum, 3 months	0.1212***	(2.75)
Earnings to price volatility	-0.5570***	(-3.33)	Momentum, 6 months	0.1640***	(3.90)
Dividend to price volatility	-0.0153	(-1.02)	Momentum, 12 months	0.4376***	(11.15)
Cash flow to price volatility	0.5972***	(3.63)	Momentum, 24 months	0.0292	(0.91)
Market capitalization	-0.0399*	(-1.90)	Momentum, 60 months	-0.0251	(-1.17)
Stock price	0.1279***	(3.75)	Durables	-0.2240**	(-2.52)
Trading volume	-0.3957***	(-7.27)	Nondurables	-0.0477	(-0.47)
Trading volume trend	-0.0829***	(-4.31)	Utilities	0.0575	(0.44)
Earnings to price	0.1252	(1.24)	Energy	-0.0569	(-0.22)
Earnings to price trend	0.3413***	(3.33)	Construction	-0.1819	(-1.21)
Book to price	0.3000***	(9.85)	Business equipment	-0.0698	(-0.95)
Book to price trend	-0.0087	(-0.43)	Manufacturing	0.2025***	(3.47)
Dividend to price	-0.0142	(-0.44)	Transportation	0.2334**	(2.28)
Dividend to price trend	0.0101	(0.67)	Financial	-0.0532	(-0.58)
Cash flow to price	0.1205	(1.34)	Business services	0.2711***	(2.78)
Cash flow to price trend	-0.3295***	(-3.35)	Constant	-0.1753	(-0.63)
Sales to price	0.0351	(0.96)	Adj. R2	0.0846	

Panel D: Beta's, January 1970 to December 2014

	(1)	(2)	(3)	(4)	(5)	(6)
	FFC	FF5	HXZ	FFC	FF5	HXZ
Dep. Var.	Simple return			Log return		
Beta, market	-0.0078	-0.0188	0.0075	-0.2523***	-0.2618***	-0.2773***
	(-0.11)	(-0.25)	(0.09)	(-3.52)	(-3.65)	(-3.33)
Beta, size	0.0050	-0.0046	0.0601	-0.3720***	-0.3603***	-0.2576***
	(0.06)	(-0.06)	(0.83)	(-4.97)	(-5.24)	(-3.87)
Beta, BM	0.1495	0.2251**		0.3746***	0.4947***	
	(1.49)	(2.00)		(3.89)	(4.54)	
Beta, momentum	-0.1194**			-0.0213		
	(-2.09)			(-0.40)		
Beta, profitability		-0.0007	-0.1094		0.3543***	0.2496***
		(-0.01)	(-1.20)		(4.56)	(2.94)
Beta, investment		0.1438*	0.0814		0.3274***	0.2754***
		(1.66)	(1.03)		(3.86)	(3.71)
Constant	1.2176***	1.2176***	1.4650***	-0.1232	-0.1232	0.0717
	(4.74)	(4.74)	(5.54)	(-0.48)	(-0.48)	(0.27)
Adj. R2	0.0229	0.0234	0.0204	0.0255	0.0261	0.0231

Table 5: Expected stock return and actual stock return

Panel A presents the results of Fama-MacBeth regressions the dependent variable is the actual monthly simple or log return and the explanatory variable is the expected simple or log return, based on the models reported in Table 4. T-statistics for tests of whether the estimated coefficient equals zero (one) are reported in parentheses (brackets). In each month from January 1980 to December 2014, stocks are sorted into deciles based on their expected simple or log return. Panels B-C present equal- and value-weighted returns to portfolios sorted on expected simple return, while panels D and E present the same information for the portfolios sorted on expected log return. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

Panel A: Fama-MacBeth regression of actual return on expected return, January 1980 to December 2014

	C5	C14	C46	FFC	FF5	HXZ
Dependent var.			Actual simple return			
Expected simple return	0.8577***	0.8238***	0.6128***	-0.1079	-0.5543	-0.2015
	(11.16)	(12.60)	(12.21)	(-0.30)	(-0.92)	(-0.40)
	[-1.85]	[-2.69]	[-7.71]	[-3.08]	[-2.58]	[-2.39]
Constant	0.0651	0.1304	0.3699	1.3941**	1.8905**	1.4266**
	(0.21)	(0.43)	(1.39)	(2.43)	(1.97)	(2.00)
N	1,933,845	1,933,845	2,014,341	2,156,466	2,156,466	2,156,466
R2	0.007	0.008	0.008	0.005	0.008	0.007
Dependent var.			Actual log return			
Expected log return	1.0268***	1.0361***	0.8599***	0.7238***	0.8922***	0.8920***
	(14.32)	(13.20)	(16.48)	(4.22)	(5.67)	(4.86)
	[0.37]	[0.46]	[-2.69]	[-1.61]	[-0.69]	[-0.59]
Constant	-0.2664	-0.2749	-0.2608	-0.3091	-0.3846	-0.3551
	(-0.95)	(-0.99)	(-0.96)	(-1.11)	(-1.35)	(-1.36)
N	1,933,845	1,933,845	2,014,341	2,156,466	2,156,466	2,156,466
R2	0.016	0.026	0.020	0.010	0.011	0.012

Panel B: Equal-weighted returns to portfolios sorted on expected simple return

	C5		C14		C46		FFC		FF5		HXZ	
Decile	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std
Low	-0.19	7.08	-0.42	7.26	-0.26	7.20	0.83**	7.76	0.92**	8.43	0.98***	7.35
2	0.55*	5.91	0.38	6.08	0.52*	5.63	1.12***	6.30	1.17***	6.81	1.10***	5.99
3	0.84***	5.52	0.81***	5.51	0.81***	5.23	1.25***	5.53	1.22***	5.90	1.17***	5.54
4	0.98***	5.42	1.06***	5.21	0.90***	5.00	1.23***	5.00	1.30***	5.47	1.24***	5.13
5	1.14***	5.22	1.22***	5.11	1.15***	5.00	1.19***	4.79	1.22***	5.00	1.30***	4.97
6	1.18***	5.28	1.28***	5.13	1.27***	5.12	1.28***	4.83	1.28***	4.83	1.22***	4.92
7	1.33***	5.30	1.42***	5.19	1.32***	5.24	1.24***	5.05	1.25***	4.92	1.16***	5.06
8	1.45***	5.37	1.50***	5.48	1.52***	5.71	1.16***	5.46	1.09***	5.13	1.14***	5.55
9	1.77***	5.74	1.78***	5.99	1.82***	6.46	1.11***	6.25	1.00***	5.75	1.00***	6.39
High	2.44***	7.04	2.38***	7.08	2.87***	8.21	0.73*	7.58	0.66*	7.13	0.77*	8.16
High - Low	2.63***	4.57	2.81***	4.71	3.13***	4.85	-0.10	4.74	-0.26	5.83	-0.22	5.68

Panel C: Value-weighted returns to portfolios sorted on expected simple return

	C5		C14		C46		FFC		FF5		HXZ	
Decile	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std
Low	0.85***	5.01	0.48*	5.70	0.71**	6.11	1.19***	7.54	1.17***	8.27	1.28***	7.39
2	1.09***	4.42	0.96***	4.65	0.79***	4.88	1.32***	5.89	1.24***	6.53	1.40***	5.86
3	1.13***	4.54	1.15***	4.50	0.95***	4.59	1.30***	5.23	1.33***	5.66	1.35***	5.23
4	1.18***	4.55	1.17***	4.55	0.92***	4.56	1.20***	4.86	1.23***	5.27	1.18***	4.94
5	1.27***	4.91	1.33***	4.83	1.14***	4.58	1.08***	4.54	1.18***	4.94	1.26***	4.63
6	1.39***	5.17	1.27***	5.02	1.17***	4.79	1.07***	4.68	1.19***	4.68	1.12***	4.83
7	1.49***	5.87	1.37***	5.73	1.18***	5.08	1.04***	4.68	1.17***	4.61	1.16***	4.83
8	1.52***	5.84	1.33***	6.30	1.14***	5.54	1.00***	5.12	1.03***	4.84	0.90***	5.57
9	1.78***	6.59	1.76***	6.91	1.43***	6.17	0.99***	6.04	0.90***	5.31	0.73**	6.27
High	1.97***	7.90	1.89***	8.45	1.68***	7.57	0.55	7.47	0.61*	6.95	0.60*	7.40
High - Low	1.12***	6.20	1.42***	6.74	0.97***	5.60	-0.65*	6.76	-0.56	7.33	-0.68*	7.40

Panel D: Equal-weighted returns to portfolios sorted on expected log return

	C5		C14		C46		FFC		FF5		HXZ	
Decile	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std
Low	-0.23	9.12	-0.46	10.09	-0.55	9.13	0.77*	9.38	0.70	9.37	0.69	9.46
2	0.50	7.46	0.61	8.01	0.68*	7.50	0.99***	7.79	1.10***	7.86	1.01***	7.77
3	0.94***	6.41	0.97***	6.97	0.81**	6.42	1.12***	6.74	1.06***	6.83	1.09***	6.77
4	1.10***	5.66	1.18***	6.12	1.10***	5.84	1.19***	6.07	1.17***	6.03	1.19***	5.94
5	1.25***	5.21	1.27***	5.47	1.23***	5.36	1.24***	5.44	1.25***	5.45	1.29***	5.49
6	1.39***	4.96	1.45***	4.91	1.38***	4.95	1.28***	5.05	1.26***	4.93	1.28***	5.09
7	1.48***	4.76	1.46***	4.55	1.45***	4.73	1.20***	4.53	1.21***	4.53	1.25***	4.63
8	1.50***	4.63	1.52***	4.32	1.53***	4.63	1.26***	4.17	1.20***	4.18	1.19***	4.35
9	1.58***	4.63	1.58***	4.13	1.72***	4.64	1.19***	4.06	1.19***	4.02	1.15***	4.11
High	1.87***	5.61	1.75***	3.97	2.19***	5.30	0.83***	5.15	0.87***	4.99	0.85***	4.87
High - Low	2.10***	6.07	2.21***	7.75	2.74***	6.54	0.06	6.22	0.17	6.32	0.16	6.71

Panel E: Value-weighted returns to portfolios sorted on expected log return

	C5		C14		C46		FFC		FF5		HXZ	
Decile	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std	Ret	Std
Low	-0.51	8.90	-0.63	9.90	0.01	8.62	0.92**	9.50	0.71	9.62	0.78	9.71
2	0.49	7.49	0.50	7.76	0.68*	7.29	0.96**	7.94	1.11***	8.34	1.02**	8.18
3	0.64**	6.26	0.70**	6.83	0.73**	6.22	0.84**	6.90	0.95***	7.18	1.12***	7.06
4	0.74***	5.78	0.95***	5.67	0.94***	5.49	1.08***	6.35	0.97***	6.42	1.01***	6.38
5	1.00***	5.28	0.89***	5.07	0.96***	4.94	1.06***	5.82	1.06***	5.61	1.16***	5.81
6	1.08***	4.88	1.16***	4.62	1.14***	4.67	1.11***	5.05	1.00***	5.09	1.15***	5.30
7	1.03***	4.75	1.34***	4.24	1.02***	4.58	1.02***	4.50	1.11***	4.63	1.19***	4.87
8	1.17***	4.46	1.28***	4.12	1.22***	4.49	1.18***	4.17	1.09***	4.26	1.18***	4.65
9	1.19***	4.39	1.28***	4.09	1.26***	4.55	1.11***	3.92	1.12***	3.88	1.19***	4.23
High	1.31***	4.77	1.50***	4.71	1.43***	5.22	1.01***	5.11	1.00***	4.60	0.94***	4.37
High - Low	1.82***	6.59	2.13***	7.91	1.41***	6.77	0.08	8.32	0.29	8.25	0.16	8.53

Table 6: Difference in firm characteristics between event and non-event firms

This table reports the coefficient estimated on an event firm dummy that equals one if the firm has engaged in the indicated corporate event during any of the prior thirty six months and zero if the firm did not do so. Within each month, firm characteristics are winsorized at the upper and lower 1%, and then normalized by subtracting the mean and dividing by the standard deviation. See the Appendix for detailed variable definitions. We cluster standard errors by time in pooled regressions. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

	Size	BM	Momentum	ROA	Investment
			Pooled		
M&A	0.41***	-0.09***	-0.01***	0.01	0.29***
	(53.99)	(-16.30)	(-2.97)	(1.39)	(46.80)
SEO	0.31***	-0.39***	0.04***	-0.19***	0.36***
	(24.23)	(-46.36)	(3.61)	(-8.78)	(55.34)
IPO	-0.24***	-0.32***	-0.21***	-0.28***	0.94***
	(-36.48)	(-33.81)	(-19.32)	(-20.87)	(62.13)
Div. ini.	-0.00	0.13***	0.13***	0.39***	-0.06***
	(-0.42)	(22.34)	(15.16)	(107.82)	(-9.15)
Share rep.	0.42***	0.14***	0.04***	0.34***	-0.23***
	(46.26)	(22.74)	(5.71)	(105.31)	(-39.59)
Stock split	0.62***	-0.40***	0.26***	0.48***	0.13***
	(100.46)	(-55.88)	(32.24)	(159.14)	(18.39)
			Fama-MacBeth		
M&A	0.60***	-0.05***	0.01*	0.08***	0.25***
	(25.88)	(-5.08)	(1.84)	(9.70)	(21.25)
SEO	0.32***	-0.41***	0.06***	-0.15***	0.39***
	(26.71)	(-36.67)	(5.08)	(-7.12)	(43.35)
IPO	-0.19***	-0.42***	-0.20***	-0.25***	0.94***
	(-22.46)	(-22.39)	(-18.55)	(-16.28)	(41.48)
Div. ini.	-0.07***	0.12***	0.16***	0.39***	-0.06***
	(-5.63)	(18.67)	(14.35)	(95.90)	(-8.48)
Share rep.	0.46***	0.16***	0.06***	0.33***	-0.23***
	(43.57)	(23.41)	(8.13)	(52.89)	(-40.71)
Stock split	0.63***	-0.42***	0.26***	0.50***	0.16***
	(103.03)	(-50.50)	(23.62)	(149.35)	(20.45)

Table 7: Abnormal Returns Based on Characteristic Models over 36 months after the event

This table reports the estimated intercept in pooled or Fama-MacBeth regressions where the dependent variable difference between the actual return and the expected return obtained from the characteristic-based model. The analysis includes returns for each firm that engaged in the indicated event over the 36 months following each event. The expected return is computed using models in Table 4, and is known before the beginning of the month. We cluster standard errors by time in pooled regressions. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

Panel A: Whole period, 1980-2014

	C5	C14	C46	C5	C14	C46
	Simple return - Expected simple return			Log return - Expected log return		
	Pooled					
M&A	-0.17	-0.18	-0.37	-0.49	-0.38	-0.41
	(-0.39)	(-0.42)	(-0.85)	(-1.12)	(-0.86)	(-0.94)
SEO	-0.21	-0.20	-0.38	-0.49	-0.27	-0.36
	(-0.56)	(-0.53)	(-0.99)	(-1.27)	(-0.68)	(-0.90)
IPO	-0.20	-0.18	-0.52	-0.83	-0.65	-0.95*
	(-0.40)	(-0.35)	(-1.00)	(-1.62)	(-1.27)	(-1.83)
Div. ini.	-0.05	-0.01	-0.02	0.29	0.21	0.20
	(-0.21)	(-0.03)	(-0.10)	(1.23)	(0.87)	(0.81)
Share rep.	0.13	0.14	0.14	0.17	0.10	0.16
	(0.44)	(0.49)	(0.49)	(0.60)	(0.34)	(0.56)
Stock split	-0.02	-0.01	-0.27	-0.20	-0.19	-0.42
	(-0.06)	(-0.02)	(-0.88)	(-0.63)	(-0.61)	(-1.31)
	Fama-MacBeth					
M&A	-0.01	-0.07	-0.15	-0.16	-0.11	-0.07
	(-0.03)	(-0.24)	(-0.48)	(-0.52)	(-0.34)	(-0.23)
SEO	-0.02	-0.00	-0.29	-0.26	-0.03	-0.24
	(-0.04)	(-0.01)	(-0.78)	(-0.69)	(-0.09)	(-0.64)
IPO	0.05	0.08	-0.42	-0.32	-0.20	-0.70*
	(0.12)	(0.19)	(-1.04)	(-0.80)	(-0.49)	(-1.72)
Div. ini.	-0.02	0.03	-0.17	0.21	0.12	-0.08
	(-0.06)	(0.13)	(-0.62)	(0.80)	(0.44)	(-0.30)
Share rep.	0.06	0.05	0.09	0.17	0.09	0.18
	(0.26)	(0.20)	(0.34)	(0.69)	(0.37)	(0.70)
Stock split	0.18	0.18	-0.15	0.07	0.06	-0.22
	(0.63)	(0.64)	(-0.54)	(0.24)	(0.21)	(-0.75)

Panel B: First period, 1980-1997

	C5	C14	C46	C5	C14	C46
	Simple return - Expected simple return			Log return - Expected log return		
	Pooled					
M&A	0.10	0.08	-0.06	-0.07	-0.01	0.02
	(0.21)	(0.18)	(-0.13)	(-0.16)	(-0.03)	(0.04)
SEO	-0.18	-0.15	-0.38	-0.32	-0.22	-0.34
	(-0.42)	(-0.35)	(-0.86)	(-0.73)	(-0.50)	(-0.76)
IPO	-0.22	-0.12	-0.48	-0.44	-0.32	-0.63
	(-0.47)	(-0.25)	(-0.99)	(-0.91)	(-0.65)	(-1.26)
Div. ini.	0.12	0.14	0.12	0.26	0.18	0.15
	(0.35)	(0.42)	(0.34)	(0.77)	(0.51)	(0.42)
Share rep.	0.33	0.31	0.37	0.36	0.29	0.40
	(0.99)	(0.92)	(1.10)	(1.07)	(0.87)	(1.20)
Stock split	0.08	0.05	-0.17	-0.02	-0.08	-0.27
	(0.21)	(0.15)	(-0.45)	(-0.06)	(-0.20)	(-0.70)
	Fama-MacBeth					
M&A	0.06	-0.03	-0.01	-0.16	-0.13	-0.02
	(0.15)	(-0.08)	(-0.04)	(-0.40)	(-0.33)	(-0.05)
SEO	-0.00	0.04	-0.41	-0.17	-0.07	-0.43
	(-0.00)	(0.09)	(-0.91)	(-0.38)	(-0.16)	(-0.93)
IPO	-0.22	-0.08	-0.90*	-0.53	-0.43	-1.19**
	(-0.45)	(-0.17)	(-1.84)	(-1.08)	(-0.87)	(-2.41)
Div. ini.	0.10	0.13	-0.24	0.19	0.11	-0.23
	(0.28)	(0.35)	(-0.58)	(0.51)	(0.29)	(-0.55)
Share rep.	0.10	0.05	0.15	0.12	0.05	0.16
	(0.31)	(0.17)	(0.46)	(0.36)	(0.14)	(0.48)
Stock split	0.24	0.22	-0.18	0.12	0.07	-0.28
	(0.66)	(0.58)	(-0.48)	(0.33)	(0.19)	(-0.73)

Panel C: Second period, 1998-2014

	C5	C14	C46	C5	C14	C46
	Simple return - Expected simple return			Log return - Expected log return		
	Pooled					
M&A	-0.30	-0.31	-0.52	-0.70	-0.56	-0.62
	(-0.50)	(-0.52)	(-0.86)	(-1.14)	(-0.91)	(-1.02)
SEO	-0.24	-0.25	-0.38	-0.66	-0.31	-0.37
	(-0.39)	(-0.40)	(-0.61)	(-1.03)	(-0.48)	(-0.57)
IPO	-0.18	-0.25	-0.57	-1.34	-1.10	-1.37
	(-0.18)	(-0.25)	(-0.57)	(-1.34)	(-1.10)	(-1.36)
Div. ini.	-0.18	-0.12	-0.13	0.32	0.23	0.23
	(-0.55)	(-0.39)	(-0.40)	(0.96)	(0.70)	(0.69)
Share rep.	-0.01	0.03	-0.01	0.05	-0.03	0.01
	(-0.02)	(0.07)	(-0.02)	(0.12)	(-0.07)	(0.03)
Stock split	-0.20	-0.12	-0.44	-0.52	-0.40	-0.67
	(-0.37)	(-0.22)	(-0.83)	(-0.94)	(-0.72)	(-1.22)
	Fama-MacBeth					
M&A	-0.08	-0.12	-0.28	-0.17	-0.09	-0.13
	(-0.16)	(-0.25)	(-0.58)	(-0.34)	(-0.18)	(-0.26)
SEO	-0.03	-0.05	-0.16	-0.35	0.01	-0.04
	(-0.06)	(-0.08)	(-0.27)	(-0.57)	(0.01)	(-0.07)
IPO	0.32	0.24	0.05	-0.11	0.04	-0.22
	(0.51)	(0.37)	(0.08)	(-0.17)	(0.06)	(-0.35)
Div. ini.	-0.14	-0.07	-0.10	0.23	0.12	0.07
	(-0.40)	(-0.19)	(-0.28)	(0.63)	(0.33)	(0.19)
Share rep.	0.03	0.04	0.02	0.23	0.14	0.20
	(0.07)	(0.11)	(0.05)	(0.60)	(0.37)	(0.51)
Stock split	0.10	0.14	-0.12	0.01	0.05	-0.15
	(0.25)	(0.33)	(-0.29)	(0.02)	(0.11)	(-0.35)

Table 8: Abnormal Returns Based on Characteristic Models over 60 months after the event

This table reports the estimated intercept in pooled or Fama-MacBeth regressions where the dependent variable difference between the actual return and the expected return obtained from the characteristic-based model. The analysis includes returns for each firm that engaged in the indicated event over the 60 months following each event.. The expected return is computed using models in Table 4, and is known before the beginning of the month. We cluster standard errors by time in pooled regressions. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

	C5	C14	C46	C5	C14	C46
	Simple return - Expected simple return			Log return - Expected log return		
	Pooled					
M&A	-0.12	-0.13	-0.25	-0.38	-0.26	-0.23
	(-0.30)	(-0.33)	(-0.62)	(-0.92)	(-0.62)	(-0.56)
SEO	-0.16	-0.16	-0.25	-0.45	-0.24	-0.22
	(-0.42)	(-0.42)	(-0.65)	(-1.16)	(-0.62)	(-0.57)
IPO	-0.13	-0.11	-0.29	-0.75	-0.55	-0.67
	(-0.27)	(-0.23)	(-0.58)	(-1.51)	(-1.09)	(-1.33)
Div. ini.	-0.17	-0.14	-0.12	0.11	0.03	0.04
	(-0.68)	(-0.53)	(-0.47)	(0.40)	(0.10)	(0.14)
Share rep.	0.10	0.12	0.12	0.17	0.11	0.17
	(0.36)	(0.40)	(0.42)	(0.59)	(0.38)	(0.59)
Stock split	-0.07	-0.08	-0.25	-0.21	-0.22	-0.35
	(-0.25)	(-0.28)	(-0.85)	(-0.69)	(-0.73)	(-1.12)
	Fama-MacBeth					
M&A	-0.01	-0.07	-0.10	-0.16	-0.09	-0.01
	(-0.03)	(-0.25)	(-0.34)	(-0.52)	(-0.29)	(-0.04)
SEO	-0.01	-0.00	-0.22	-0.22	-0.02	-0.15
	(-0.01)	(-0.01)	(-0.62)	(-0.62)	(-0.06)	(-0.40)
IPO	-0.01	0.02	-0.35	-0.35	-0.18	-0.52
	(-0.04)	(0.04)	(-0.91)	(-0.90)	(-0.46)	(-1.35)
Div. ini.	-0.04	0.00	-0.17	0.15	0.06	-0.11
	(-0.17)	(0.00)	(-0.63)	(0.56)	(0.23)	(-0.39)
Share rep.	0.02	0.00	0.05	0.13	0.06	0.14
	(0.07)	(0.01)	(0.19)	(0.49)	(0.22)	(0.54)
Stock split	0.09	0.07	-0.18	0.03	0.01	-0.18
	(0.33)	(0.27)	(-0.66)	(0.12)	(0.03)	(-0.66)

Table 9: Differences in stock return between event firms and matched firms over 36 months after the event

For each event firm/month, we identify a matching firm either based on expected simple/log stock return. This table reports the estimated intercept in pooled or Fama-MacBeth regressions where the dependent variable is the difference in simple/log return between the event firm and the matching firm over the 36 months following each event. The expected return is computed using models in Table 4, and is known before the beginning of the month. We cluster standard errors by time in pooled regressions. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

	C5	C14	C46	C5	C14	C46
	Match on expected simple return			Match on expected log return		
	Pooled					
M&A	-0.01	-0.03	-0.21**	-0.26***	-0.17*	-0.21**
	(-0.12)	(-0.36)	(-2.04)	(-2.65)	(-1.88)	(-2.26)
SEO	-0.02	-0.04	-0.20	-0.22*	-0.04	-0.17
	(-0.19)	(-0.30)	(-1.53)	(-1.92)	(-0.39)	(-1.44)
IPO	0.06	0.03	-0.40**	-0.11	-0.02	-0.55***
	(0.35)	(0.16)	(-2.32)	(-0.95)	(-0.19)	(-3.61)
Div. ini.	0.02	0.08	0.18	0.25***	0.09	0.20*
	(0.18)	(0.77)	(1.54)	(2.72)	(0.98)	(1.88)
Share rep.	0.15	0.18**	0.24**	0.20***	0.19***	0.39***
	(1.54)	(2.13)	(2.55)	(4.08)	(4.22)	(5.43)
Stock split	0.27***	0.28***	0.05	0.20**	0.22**	0.13
	(2.93)	(3.10)	(0.49)	(2.30)	(2.55)	(1.43)
	Fama-MacBeth					
M&A	0.15	0.05	0.12	-0.00	-0.02	0.11
	(1.21)	(0.41)	(0.90)	(-0.02)	(-0.20)	(0.87)
SEO	0.07	0.04	-0.15	-0.14	0.01	-0.09
	(0.59)	(0.30)	(-1.20)	(-1.21)	(0.10)	(-0.81)
IPO	0.11	0.10	-0.19	-0.05	0.08	-0.37***
	(0.64)	(0.59)	(-1.19)	(-0.34)	(0.63)	(-2.62)
Div. ini.	0.14	0.18	0.18	0.31***	0.23**	0.15
	(1.00)	(1.27)	(1.18)	(2.62)	(2.05)	(1.20)
Share rep.	0.16**	0.15**	0.28***	0.20***	0.21***	0.46***
	(2.31)	(2.16)	(3.51)	(3.33)	(4.61)	(6.67)
Stock split	0.24***	0.23**	0.02	0.23***	0.23***	0.11
	(2.91)	(2.56)	(0.18)	(2.77)	(2.81)	(1.25)

Table 10: Difference in stock return between event firms and matching firms over 36 months after the event: 10 matching firms

For each event firm/month, we identify 10 matching firms with the closest expected simple/log stock return in the month. This table reports the estimated intercept in pooled or Fama-MacBeth regressions where the dependent variable is the difference in simple/log return between the event firm and the average matching firm over the 36 months following each event. The expected return is computed using models in Table 4, and is known before the beginning of the month. We cluster standard errors by time in pooled regressions. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

	C5	C14	C46	C5	C14	C46
	Match on expected simple return			Match on expected log return		
	Pooled					
M&A	-0.07	-0.06	-0.21**	-0.23**	-0.16*	-0.19**
	(-0.87)	(-0.75)	(-2.30)	(-2.54)	(-1.93)	(-2.18)
SEO	-0.03	-0.06	-0.21*	-0.17	-0.04	-0.16
	(-0.32)	(-0.54)	(-1.77)	(-1.49)	(-0.34)	(-1.41)
IPO	0.06	0.03	-0.39**	-0.07	0.03	-0.59***
	(0.36)	(0.19)	(-2.35)	(-0.66)	(0.37)	(-3.98)
Div. ini.	0.04	0.12	0.13	0.19**	0.16**	0.22***
	(0.45)	(1.41)	(1.50)	(2.52)	(2.39)	(2.94)
Share rep.	0.17*	0.17**	0.25***	0.25***	0.20***	0.39***
	(1.93)	(2.15)	(2.68)	(5.74)	(4.94)	(5.59)
Stock split	0.29***	0.25***	0.12	0.19**	0.21**	0.16*
	(3.39)	(2.95)	(1.22)	(2.36)	(2.54)	(1.92)
	Fama-MacBeth					
M&A	0.06	0.03	-0.02	-0.02	-0.03	0.01
	(0.68)	(0.39)	(-0.23)	(-0.24)	(-0.35)	(0.08)
SEO	0.04	0.02	-0.16	-0.07	0.04	-0.09
	(0.38)	(0.19)	(-1.32)	(-0.61)	(0.42)	(-0.85)
IPO	0.11	0.08	-0.22	0.03	0.09	-0.40***
	(0.68)	(0.49)	(-1.48)	(0.22)	(0.87)	(-2.89)
Div. ini.	0.08	0.23*	0.13	0.27***	0.23***	0.24**
	(0.69)	(1.95)	(1.10)	(2.84)	(2.68)	(2.30)
Share rep.	0.17***	0.16**	0.27***	0.25***	0.21***	0.44***
	(2.59)	(2.50)	(4.02)	(5.74)	(5.08)	(7.95)
Stock split	0.25***	0.23***	0.06	0.19**	0.19***	0.12
	(3.17)	(2.85)	(0.66)	(2.54)	(2.60)	(1.48)

Table 11: Actual event firm stock return and expected stock return to event firm

This table presents Fama-MacBeth regression results where the dependent variable is the actual monthly simple or log return to the event firm over the 36 months after the event and the explanatory variables are the expected raw or log return based on each of five firm characteristics using models specified in Table 4. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

	M&A	SEO	IPO	Div. ini.	Share rep.	Stock split
	Simple return					
Expected return, Log Size	7.40	2.28	7.53	16.08	5.79	-0.46
	(1.02)	(0.84)	(1.32)	(1.27)	(1.17)	(-0.50)
Expected return, Log BM	0.90***	0.47**	1.10***	0.45	0.56***	0.60***
	(4.02)	(2.28)	(4.16)	(1.34)	(3.31)	(3.30)
Expected return, Momentum	-0.01	1.03	1.00	0.59	0.21	1.41*
	(-0.01)	(1.50)	(0.88)	(0.50)	(0.26)	(1.87)
Expected return, ROA	-258.83	34.18	-104.50	171.77	-106.14	-433.57
	(-1.29)	(0.82)	(-0.94)	(0.93)	(-0.91)	(-1.18)
Expected return, Investment	0.93***	0.78***	0.61**	0.78**	0.60***	0.61***
	(7.22)	(5.79)	(2.23)	(2.30)	(4.48)	(3.47)
	Log return					
Expected log return, Log Size	9.63	1.58**	2.46**	-5.75	1.09***	3.07
	(1.24)	(2.32)	(2.11)	(-0.89)	(2.92)	(1.34)
Expected log return, Log BM	1.04***	0.12	0.86***	0.34	0.76***	0.77**
	(2.94)	(0.43)	(2.69)	(0.85)	(3.33)	(2.38)
Expected log return, Momentum	1.11***	1.22***	1.70***	0.96***	0.76***	0.85***
	(5.80)	(8.19)	(8.33)	(4.23)	(5.21)	(5.01)
Expected log return, ROA	1.09***	1.31***	0.85***	1.53**	0.91**	0.99***
	(5.54)	(3.27)	(2.93)	(2.50)	(2.44)	(3.42)
Expected log return, Investment	1.03***	0.98***	0.74***	0.88***	0.81***	1.01***
	(8.02)	(7.50)	(3.10)	(2.80)	(6.45)	(5.33)

Internet Appendix

Table A1: Abnormal return to event firms (relative to expected return) over 36 months after the event

This table reports the estimated intercept in pooled or Fama-MacBeth regressions where the dependent variable is the abnormal return of the event firm relative to the expected stock return over the 36 months following each event. The expected return is computed using models in Table 4, and is known before the beginning of the month. We cluster standard errors by time in pooled regressions. Superscripts ***, **, and * correspond to statistical significance at the one, five, and ten percent levels, respectively.

	C5	C14	C46	C5	C14	C46
	Simple return - [exp(expected log return) - 1]			Log return - log(1 + expected simple return)		
	Pooled					
M&A	1.06**	1.17***	1.12***	-1.72***	-1.73***	-1.91***
	(2.46)	(2.72)	(2.60)	(-3.92)	(-3.95)	(-4.33)
SEO	1.06***	1.28***	1.20***	-1.77***	-1.76***	-1.94***
	(2.79)	(3.38)	(3.11)	(-4.54)	(-4.51)	(-4.89)
IPO	1.50***	1.68***	1.38***	-2.55***	-2.52***	-2.86***
	(2.96)	(3.30)	(2.69)	(-4.93)	(-4.87)	(-5.44)
Div. ini.	1.05***	0.96***	0.94***	-0.80***	-0.75***	-0.76***
	(4.48)	(4.10)	(3.96)	(-3.32)	(-3.15)	(-3.13)
Share rep.	1.17***	1.09***	1.15***	-0.86***	-0.85***	-0.85***
	(4.10)	(3.83)	(4.03)	(-3.00)	(-2.96)	(-2.94)
Stock split	0.75**	0.76**	0.52*	-0.96***	-0.95***	-1.21***
	(2.46)	(2.47)	(1.69)	(-3.05)	(-3.01)	(-3.77)
	Fama-MacBeth					
M&A	1.02***	1.07***	1.09***	-1.19***	-1.25***	-1.31***
	(3.30)	(3.47)	(3.53)	(-3.77)	(-3.98)	(-4.14)
SEO	1.26***	1.48***	1.26***	-1.54***	-1.52***	-1.79***
	(3.43)	(4.03)	(3.41)	(-4.10)	(-4.06)	(-4.76)
IPO	1.71***	1.83***	1.32***	-1.99***	-1.97***	-2.44***
	(4.24)	(4.55)	(3.24)	(-4.93)	(-4.86)	(-5.97)
Div. ini.	1.07***	0.97***	0.75***	-0.87***	-0.82***	-1.00***
	(4.10)	(3.73)	(2.77)	(-3.28)	(-3.09)	(-3.57)
Share rep.	1.03***	0.95***	1.03***	-0.79***	-0.80***	-0.76***
	(4.14)	(3.81)	(4.11)	(-3.11)	(-3.17)	(-2.99)
Stock split	0.98***	0.96***	0.67**	-0.73**	-0.72**	-1.04***
	(3.50)	(3.46)	(2.41)	(-2.55)	(-2.54)	(-3.62)