

# **An analysis of the characteristics of firms conducting corporate events inside and outside waves**

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## **Abstract**

We examine whether firms participating in four separate types of corporate events (seasoned equity offerings or SEOs, mergers – both stock and cash-financed, and share repurchases) within waves differ in predictable patterns from firms that engage in event activity outside waves. We also examine whether firm characteristics evolve similarly as event waves progress. Our findings suggest that waves are driven by the availability of growth opportunities and end when these opportunities disappear. We find little evidence that seasoned equity offering waves occur when rational managers try to take advantage of irrationally optimistic markets. These waves are more likely to be driven by managers issuing equity to take advantage of growth opportunities. Stock-financed acquisition waves are likely to be driven by the lack of internal growth opportunities in the firm and the availability of a large pool of targets with growth opportunities. Repurchase waves seem likely to be driven by undervalued firms. The patterns for cash-financed acquisition waves are not as clear, leaving us unable to draw clear conclusions on why these waves occur. In addition, especially for stock-financed acquisitions, the larger, less profitable firms completing events at the end of waves earn significantly lower long-horizon excess returns, suggesting a degree of market misvaluation appears as waves progress.

**Keywords:** Merger waves; Seasoned equity issue waves; Repurchase waves; Firm characteristics

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## I. Introduction

Prior literature has documented that corporate events occur in waves. Examples of these event waves include mergers (Weston, Mitchell, and Mulherin, 2004, Andrade, Mitchell, and Stafford, 2001, Rhodes-Kropf, Robinson, and Viswanathan, 2005, Harford, 2005, and Dong, Hirshleifer, Richardson, and Teoh, 2006), seasoned equity offerings (SEOs) (Lucas and McDonald, 1990, Choe, Masulis and Nanda, 1993, and Bayless and Chaplinsky, 1996), and stock repurchases (Dittmar and Dittmar, 2008). There is little evidence in the literature however, on whether firms engaged in these types of events differ systematically in their characteristics. Do firms that engage in event activity within waves differ in predictable patterns from firms that engage in event activity outside waves? Do firm characteristics evolve similarly as event waves progress?

Answering these questions is important. There are two major hypotheses that have been advocated as competing explanations behind waves of corporate events. According to the *neoclassical explanation*, waves occur for efficiency reasons when an external shock – technological, regulatory or economic – affects an industry and subsequently causes a wave of events in that industry. According to the *misvaluation* explanation, managers take advantage of market misvaluations by taking their firms public, issuing equity, or making stock-financed acquisitions. If waves occur for efficiency reasons, then we should observe that firms with high ex-ante growth opportunities should participate in waves, regardless of the corporate event. In contrast, if waves form when managers take advantage of over-valued markets by issuing equity, we should observe that firms that are more likely to be misvalued take part in equity related waves (SEOs and stock-financed acquisitions) but not in cash-related waves (cash-financed acquisitions).

In addition, recent literature has shown that many types of corporate events are undertaken in conjunction. However, the evidence on which types of activity are naturally correlated is mixed. For example, Allen and Michaely (1995) note that the surge in *repurchases* after 1983 lines up with a surge in mergers. Similarly, Dittmar and Dittmar (2008) find a positive relation between levels of aggregate repurchase activity and levels of aggregate stock issuance or merger activity. In contrast, Ceylikyurt, Sevilir, and Shivdasani (2009) document a positive relationship between *new issue* activity and merger activity. Rau and Stouraitis (2009) report strong positive correlations at the industry level in contemporaneous activity within stock

issuance events of different types (SEOs, new issues and stock-financed acquisitions), and *negative* correlations between all three stock issuance events and stock repurchases. Examining firm-level characteristics in different types of corporate event waves may help us draw conclusions on which types of corporate events are naturally undertaken in conjunction.

In this paper, we examine the characteristics of firms participating in 34,768 corporate transactions classified in four different types of corporate events (6,730 SEOs, 15,379 acquisitions – both stock and cash-financed, and 12,659 open-market share repurchases) using a comprehensive dataset of corporate transactions over the 25-year period 1980-2004. We examine proxies for investment opportunities (R&D, capital expenditure), growth opportunities (Tobin's Q, dispersion of Tobin's Q), proxies for misvaluation (the firm-specific error in market-to-book ratio), stock, and operating performance to draw conclusions on the types of firms that engage in corporate event waves. For comparison purposes, in various analyses, we separately classify events in categories such as stock-issuance events - involving issues of stock (SEOs and stock-financed acquisitions), cash-payment events – involving payments of cash (cash-financed acquisitions and repurchases), organizational events – involving changes in the organization of an industry (all acquisitions, whether stock- or cash-financed) or stock-related events - related either to the issue or repurchase of stock (SEOs and repurchases).

We perform two levels of comparisons. For each event, we compare firm characteristics outside waves to firm-level characteristics at different stages within the wave, specifically events that occur in the beginning, middle and end of waves. In addition, we compare firm characteristics across different types of events and different categories of events. For all four types of events, we employ a bootstrap simulation methodology to identify waves at the industry level.

For each type of transaction, we find a significant difference between firms that announce the event within or outside waves. For instance, firms announcing stock-issuance events (SEOs and stock-financed acquisitions) have significantly higher Tobin's Q (and dispersion of Tobin's Q) within waves than outside waves, suggesting the presence of neoclassical growth opportunities. The pattern is reversed for repurchases – firms that announce repurchases have significantly lower Tobin's Q and dispersion in Tobin's Q within waves than outside waves. The pattern of various stock return measures as proxies for growth are similar. In contrast, proxies for

market misvaluation are insignificantly different within and outside waves for stock-issuance events and lower for repurchases, suggesting that repurchases are undertaken by undervalued firms.

In addition, firms that announce events within waves evolve systematically in their characteristics as the wave evolves. Our results suggest that for all four events (involving either stock-issuance or cash payments), event waves are accompanied by increases in the dispersion of Tobin's Q within the industry, a proxy for growth opportunities (Jovanovic and Rousseau, 2002), and this dispersion shrinks as the wave continues. We observe a similar pattern for R&D/assets, our proxy for investment opportunities. Our proxy for misvaluation, the firm-specific error in market-to-book ratio (Rhodes-Kropf, Robinson and Vishwanathan, 2005) is significantly positively related to the onset of stock-financed acquisitions but not SEOs and negatively related to the onset of repurchases. Our results suggest that firms with better prospects appear to announce events at the beginning of waves. Growth opportunities and leverage tend to decline during waves, and especially at later stages of waves for *all* events, although the extent of this deterioration varies, appearing more significant in stock-issuance events. The dispersion in Tobin's Q shrinks within industries suggesting that the presence of growth opportunities is important for waves to begin and end.

We also show that there is also considerable systematic variation in the characteristics of firms that conduct different types of transactions at the same stage of the wave. For most measures, the method of payment seems to be the major distinguishing characteristic – events where the consideration paid is in the form of cash (cash-financed M&A and repurchases) seem to be essentially different from events that involve issuing stock (SEOs and stock-financed M&A). The differences in firm characteristics for cash-based and stock-based events appear to persist across all stages of the waves and are often exacerbated as the waves progress. Our results suggest that the firms involved in cash-financed activity are fundamentally different from those involved in stock-financed activity, implying that inferences on waves drawn by aggregating stock- and cash-financed acquisition activity, for example, may not be appropriate.

Finally, excess stock returns at the announcement of the transaction are uniformly lower for firms doing events at the end of waves compared to other stages or outside wave periods (with the exception of repurchases). Similarly, firms doing events at the end of waves earn

significantly lower excess returns in the 12 months following the event (with the exception of acquirers in cash-financed acquisitions).

Overall, our findings suggest that waves are driven by the availability of growth opportunities and end when these opportunities disappear. The larger, less profitable firms announcing events at the end of waves earn significantly lower excess returns after the events than the smaller, more profitable firms with greater growth opportunities at the beginning of waves, suggesting a degree of market misvaluation appears as waves progress.

Our findings also shed new light on previous findings in the literature. Hertzal and Li (2008) find that firms issuing equity are more overvalued and have greater growth opportunities compared to other firms. Our evidence on SEO waves is consistent with their results. They also find that firms with greater mispricing reduce leverage and earn lower post issue abnormal returns. We show that leverage declines steadily and the 12 month post event excess returns become more negative as the waves progress. Kim and Weisbach (2008) examine the uses of the proceeds from seasoned equity offerings worldwide, and find that firms raising capital increase both R&D and capital expenditures following the stock issue. This is in line with our findings on R&D expenses. Bharadwaj and Shivdasani (2003) report that 70% of the cash tender offers in their sample are financed by bank debt. Our evidence suggests that the leverage of acquirers in cash-financed M&A increases steadily throughout the wave, and is also significantly higher at all stages compared to acquirers in stock-financed M&A. Massa, Rehman, and Vermaelen (2007) report that more than half of their initial repurchase sample belong to concentrated industries where repurchase waves form as a strategic response to other firms' actions, and that repurchases in these concentrated industries lead to lower long-horizon abnormal stock returns. Our results on the excess returns experienced by firms that buy back their shares at the peak of waves are consistent with their interpretation. Dittmar and Dittmar (2008) find a positive relation between levels of aggregate repurchase activity and levels of aggregate stock issuance or merger activity, which they interpret as evidence against the presence of misvaluation. We show that the characteristics of firms that conduct these transactions are different, and consequently overvalued firms may engage in stock issuance activity while at the same time undervalued firms may engage in repurchases.

The paper is organized as follows. The next section reviews prior literature on waves of corporate transactions while Section 3 discusses our data and methodology. Sections 4-6 report our empirical results. First, we compare the characteristics of firms that conduct each type of transaction outside waves, inside waves, and at different stages during the wave. Subsequently, we compare the characteristics of firms in different categories that conduct different types of transactions at the same stage of the wave. Finally, we examine announcement period and long-horizon excess returns following the announcement of the transactions outside waves, inside waves, and at different stages of waves. Section 7 concludes.

## **2. Literature review**

Despite much empirical and theoretical research however, the literature still lacks a consensus on why waves occur. There are two popular explanations for corporate event waves, the *neoclassical explanation*, and the *misvaluation explanation*. Subrahmanyam (2008) argues that a “basic question that arises from the [behavioral corporate finance] literature is whether managers [are] dealing with an irrational market or whether a rational market [is] dealing with irrational managers”. The neoclassical explanation argues that waves form when rational managers deal with rational markets while the misvaluation explanation assumes that markets are irrational.

Gort (1969) is one of the first papers to argue that corporate event waves occur during periods of dramatic economic changes. These changes may be due to shocks to industries in the form of technological shocks or deregulation, or changes in market liquidity or costs of capital. The economic disturbances generate discrepancies in valuation in two ways. They alter orderings of valuations of individuals and they increase the variance in firm valuations. The neoclassical explanation assumes that mergers are efficiency-increasing responses to these shocks, with more efficient firms buying less-efficient firms. Empirically, studies investigating the neoclassical explanation usually investigate the relationship between dispersion in Tobin’s  $q$  (or market-to-book ratios) or aggregate profitability, and business cycles or waves. Generally, these studies suggest that cycles are associated with the efficient allocation of capital. For example, Golbe and White (1988) find a positive relationship between merger volume and Tobin’s  $q$  or the size of the economy. Maksimovic and Phillips (2001) and Jovanovic and Rousseau (2002) show that merger

waves are preceded by increases in the dispersion of  $q$  across firms and high  $q$  firms tend to acquire low  $q$  firms.

In contrast to the neoclassical efficiency explanation, the market misvaluation explanation argues that waves arise as the result of market *misvaluation*. Shleifer and Vishny (2003) argue that financial markets may be inefficient. There are periods when some firms may be valued incorrectly. Rational managers take advantage of these inefficiencies whenever they exist by issuing over-valued stock to buy target firms (but compensating rational target firm managers through side payments to persuade them to sell). Rhodes-Kropf and Viswanathan (2004) argue that instead of side payments, rational target managers cannot distinguish the market-wide component of misvaluation from firm-specific misvaluation and consequently accept stock bids from over-valued bidders. Empirically, Rhodes-Kropf, Robinson and Viswanathan (2005), Dong, Hirshleifer, Richardson, and Teoh (2006) and Ang and Cheng (2006) decompose the market-to-book ratio of the firm into a firm-specific and a market-specific component and argue that market wide misvaluation is a significant factor in explaining why merger waves happen. Rosen (2006) examines the effect of mergers on bidding firms' stock prices and finds evidence of merger momentum in that bidder returns are higher in a hot merger market but lower in the long-term than mergers announced at other times, suggesting that investors with overoptimistic beliefs systematically misprice the synergies available from mergers. In what could be regarded as the flip side of the misvaluation argument, Vermaelen (1981, 1984) argues that undervaluation is a driving force behind stock repurchases

A number of recent studies have also documented correlations between waves of different types of corporate events. Allen and Michaely (1995) for example, note that the surge in repurchases after 1983 lines up with a surge in mergers. Fama and French (2001) argue that this may be due to acquirers repurchasing stock when they wish to finance a merger with retained earnings or debt but the acquired firm (for tax reasons) prefers stock. Firms may raise cash in an SEO (or IPO) which is then used to acquire another company in a cash-financed acquisition. This would give rise to a mechanical pattern between repurchase waves and stock-financed merger waves. Lyandres, Zhdanov, and Hsieh (2007) link a firm's decision to go public with its subsequent takeover strategy. In their model, a private firm that is uncertain of its valuation will choose to go public before making a bid since the process of going public eliminates some uncertainty in its true value. Consistent with their model, Ceylikyurt, Sevilir,

and Shivdasani (2009) document a positive relationship between new issue activity and merger activity. These studies suggest that the correlation between different types of waves is mechanical, that is, firms conduct two related transactions instead of one. Dittmar and Dittmar (2008) find a positive relation between levels of aggregate repurchase activity and levels of aggregate stock issuance or merger activity, which they interpret as evidence against the presence of misvaluation. Rau and Stouraitis (2009) find strong positive correlations at the industry level in *contemporaneous* activity within stock-issuance events of different types (SEOs, IPOs, stock-financed M&A), and negative correlations between all three stock-issuance events and stock repurchases. Similarly, there is a positive but weaker correlation between cash- and stock-financed M&A. They also show that lagged SEO volume predicts future IPO volume, and lagged SEO and IPO volume both predict future stock-financed M&A volume. In turn, lagged stock-financed acquisition activity predicts future repurchase activity. Cash-financed acquisitions seem unrelated to other corporate events.

### **3. Data and Methodology**

We obtain our sample by searching the SDC database for transactions undertaken by U.S. firms during 1980-2004. We download data on corporate acquisitions, seasoned equity issues (SEOs), and stock repurchases taking place in the U.S. markets and with U.S. target firms. Our initial sample consists of the entire universe of completed deals where the acquirer is a publicly listed company and the targets can be both public and private target. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand-alone firms, acquisitions of divested assets (transactions designated as divestitures by SDC and transactions where the target's public status is designated as a subsidiary), tender offers, leveraged buy-outs (LBOs), acquisitions of non-controlling stakes, and acquisitions of remaining interests. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We record the method of payment, and retain in the final sample deals where 100% of the consideration is paid in cash and deals where 100% of the consideration is paid in acquirer stock.<sup>1</sup> From our initial seasoned equity offering sample, we exclude shelf-

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<sup>1</sup>In many cases, the SDC misclassifies the status, method of payment etc for deals especially in the 1980s. Therefore we hand-correct the variables reported by SDC for such errors by referencing the synopsis of the transaction. We also note that the exclusion of bankrupt firms from the analysis does not impart a bias on the results. Adding acquisitions of bankrupt targets would increase our overall M&A sample by less than 3%. We also check the

registrations, issues by REITs, investment funds, federal, national, regional, city and non-governmental agencies, regional and city governments, religious organizations, universities, non-profit organizations, and professional associations. Our stock repurchase sample includes self-tender offers. Our initial sample consists of 31,194 cash-financed M&A transactions, 10,743 stock-financed M&A transactions, 10,077 SEOs, and 17,342 stock repurchases.

The analysis is done at the individual firm level. We obtain stock return, and accounting data for the universe of U.S. publicly listed firms from CRSP, COMPUSTAT, and DATASTREAM. We distinguish internal investment opportunities from external growth opportunities and use R&D expenses and capital expenditure, both scaled by total assets, as our measure of internal investment in the firm. Consistent with prior literature (see for example, Jovanovic and Rousseau, 2002), we use Tobin's Qs, Tobin's Q score rankings, and the within-industry dispersion of Tobin's Q as our measure of future (both internal and external) growth opportunities. The within-industry Tobin's Q Score ranking is estimated as  $100 - ((\text{industry rank in year-1}) / (\text{Number of firms in industry-year})) \times 100$ . Ranking values are estimated based on quintiles (Quintile 5 is the highest value). We use three stock return measures on the prior year to the event, the raw stock return, the market-adjusted return, and the alpha estimated based on a 3-factor Fama-French model as measures of both growth opportunities and potential misvaluation. Our measure of firm-specific misvaluation is the firm-specific error in market-to-book ratio, computed based on model 3 described in Rhodes-Kropf, Robinson and Viswanathan (2005) pp 577. Operating performance is measured by the sales growth in the firm over the prior year, net income margin before extraordinary items, the return on assets (ROA) based on operating income before interest and taxes (i.e., EBITD), and the return on equity (ROE) net income divided by shareholders' equity. Finally, we control for firm size and leverage in all the regressions. Firm size is measured by market capitalization. Capital structure is measured by the long-term leverage ratio (i.e., long term debt divided by total assets).

It is important to note that many of these variables have been used interchangeably for neoclassical growth opportunities as well as misvaluation. For example, while an increase in stock performance over the prior year may indicate that the market recognizes the presence of growth opportunities, an alternative explanation is that these are over-valued firms. Similarly,

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industry classification of the acquirers of bankrupt firms and find that the frequency of such deals across industries does not differ significantly from the frequency for the remaining sample.

Tobin's Q has been used as a proxy for both growth and misvaluation. In our interpretation of the results, we therefore attempt to identify broad patterns. For example, finding that stock-return performance increases within a wave without being accompanied by a simultaneous increase in firm-specific errors in market-to-book ratio is more likely to indicate that the market anticipates the presence of growth opportunities than that the firm is overvalued.

All variables are industry-adjusted based on the 48 Fama-French industries except for the 3 measures of stock market performance, the Tobin's Q score ranking, the firm-specific error in market-to-book ratio, and the measure of Tobin's Q dispersion within the firm industry. Our final sample of firms with stock return and accounting performance measures used in the analysis consists of 10,276 cash-financed M&A transactions, 5,103 stock-financed M&A transactions, 6,730 SEOs, and 12,659 stock repurchases.

As in Rau and Stouraitis (2009), our method for identifying waves is based on simulations of aggregate activity at the industry level. We create a simulated distribution for each event by randomly assigning each actual deal to a quarter within our sample period. However, even in the absence of waves, we should *a priori* expect more deals to occur in some quarters, simply because there are more firms listed, making a potentially larger pool of firms available to engage in M&A, SEO or repurchase activity. Consequently, the probability of being assigned to a specific quarter depends on the industry's actual total number of NYSE/AMEX/NASDAQ listed firms during that quarter. Therefore, periods with more listed firms will be assigned more events by our simulations. Since there are many more events in the 1990s compared to the 1980s, we do the simulations separately for 1980-1990 and for 1991-2004.<sup>2</sup> We repeat the procedure 1,000 times in order to generate 1,000 randomly drawn series for each event. Any quarter where actual activity (measured as number of deals) exceeds the maximum of the simulated distribution is designated as a potential aggregate wave quarter.

The total number of wave quarters during each sub-period (irrespective of whether they are consecutive or not) is divided by three in order to partition the wave into beginning/middle/final wave quarters. We use a straightforward method to define the beginning, middle and end of

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<sup>2</sup> This is especially true for M&A transactions (as reported by Rau and Stouraitis, 2009). Using data over the entire 1980-2004 period to simulate M&A activity gives rise to very few wave quarters during the 1980s. Most empirical research uses 10-year periods to examine merger activity since it is easier to characterize the mergers as belonging to the 1980s, the 1990s, etc.

event waves. Single wave quarters without other wave quarters in the same sub-period) are disregarded in the definition of waves. We also consider gaps between non-consecutive wave quarters as part of the wave and take them into account when deciding the break points for beginning/middle/end parts of waves. The classification of the wave stages is done at an individual industry level. Under this definition, in each industry, there is only one wave in each sub-period 1980-1990 and 1991-2003, beginning with the earliest wave quarter in the sub-period and ending with the last wave quarter in the sub-period. The total number of wave quarters during the sub-period (irrespective of whether they are consecutive or not) is divided by three in order to determine beginning/middle/final wave quarters (for example, if the wave consists of 9 quarters, there will be 3 beginning, 3 middle and 3 final wave quarters).<sup>3</sup>

There are a number of observations that we can make on the wave classification process, which is described in more detail in Rau and Stouraitis (2009). First, the simulated activity changes over time and is higher during periods when more firms were publicly listed. Second, we observe that the range of the simulated distribution is relatively narrow, therefore changing the cut-offs for identifying the waves would not have a serious impact on our results. Third, we identify with precision quarters with excess activity, and we do not artificially constrain our waves to last for a certain number of consecutive quarters. Ultimately, how many consecutive quarters of excess activity make a “wave” is a matter of interpretation rather than empirical fact.<sup>4</sup> We also note that while our classification is admittedly ad hoc, there is no theoretical guide to measuring the length of waves. In addition, there are very few industries that experience multiple waves separated by several years in our analysis. Eliminating these industries does not change our analysis. Our results are also robust to alternative ways of defining how waves progress, such as restricting intervening non-wave quarters to be no longer than a year.

#### **4. Comparing firm characteristics within and out of waves**

Table 1 compares firm characteristics across firms that conduct events within and outside waves for each event separately. Firms announcing either type of stock-financed event (SEOs and stock-financed acquisitions) have significantly higher Tobin’s Q (and dispersion of Tobin’s

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<sup>3</sup> If not divisible by three, the largest integer that is smaller than the actual number of wave quarters is divided by three in order to determine beginning and final wave quarters. The remaining quarters are classified as the middle of the wave.

<sup>4</sup> For example, Harford (2005) constrains merger waves to last for 2 years. However, there is no reason to expect *a priori* that waves for all the types of corporate events that we examine must last for the same number of quarters.

Q) within waves than outside waves, suggesting the presence of neoclassical growth opportunities. The pattern is reversed for repurchases – firms that announce repurchases have significantly lower Tobin’s Q and dispersion in Tobin’s Q within waves than outside waves. There is no obvious pattern for cash-financed acquisitions – while Tobin’s Q is significantly lower within the wave, the dispersion in Tobin’s Q increases similar to the stock-issuance events. The pattern of various stock return measures as proxies for growth are similar – for both types of stock-issuance events, Fama-French alphas and prior stock returns are higher within waves than outside waves. Again, the pattern inverts for cash-payment events – the market adjusted excess return is significantly lower for firms announcing cash-financed acquisitions and repurchases within waves than outside waves. This seems to be more consistent with the neoclassical growth explanation than market misvaluation – the proxies for market misvaluation are insignificantly different within and outside waves for stock-issuance events and *lower* for repurchases, suggesting that repurchases are undertaken by undervalued firms.

The proxies for internal growth opportunities (R&D/assets) also show patterns consistent with the neoclassical growth explanation. Firms announcing equity issues within waves have significantly higher R&D/assets than firms outside the waves. In contrast, firms announcing stock-financed acquisitions within waves have significantly lower levels of R&D/assets and capital expenditure, which may explain why these firms announce events – their internal growth opportunities are relatively low. Across each event, firms conducting transactions inside the wave have worse operating performance (net income margin and/or ROA), and are significantly smaller in terms of stock market capitalization (with firms doing transactions outside waves being two to five times larger).

Overall, our univariate analysis shows that firms conducting events inside waves have systematically different characteristics compared to firms that conduct the same events outside waves. However, waves may last for several quarters and it is possible that different firms may conduct events at different stages within the wave. Therefore, we next turn our attention to the evolution of firm characteristics for firms conducting the same event within a wave as the wave progresses. Following the methodology described in Section 3, we divide waves into three stages (beginning, middle, and end) and again examine firm characteristics as the waves progress. We report univariate statistics in Table 2. Since the results for several proxies are qualitatively similar, for brevity, we report a subset of all the proxies described in Table 1.

Operating performance (especially ROA) declines consistently across all events as the waves progress. For both the stock-financed transactions, Tobin's Q and the dispersion of Tobin's Q both increase reasonably smoothly as the waves progress. The firm specific error in market-to-book ratios increases only for SEOs, suggesting that the increase in Tobin's Q is more likely because of the market recognizing the presence of neoclassical growth opportunities than simple over-valuation. The pattern for internal investment opportunities is consistent with the growth explanation as well. While internal investment opportunities (R&D/assets) increase smoothly as the wave progresses for firms announcing seasoned equity offerings, they increase and then decrease for firms announcing stock-financed acquisitions, suggesting that seasoned equity offerings raise cash for internal investment while stock-financed acquisitions acquire external growth opportunities. Finally market capitalization also increases as the waves progress. Overall our results suggest that stock financed waves (SEOs and stock-financed acquisitions) start with more profitable, less overvalued, smaller firms with available growth opportunities. As the wave progresses, less profitable, more overvalued, and larger firms enter. Cash-financed event waves (cash-financed acquisitions and repurchases) start with more profitable and less leveraged firms, and the measures deteriorate as the wave progresses. Overall, better performing firms appear to do events in the beginning of waves, and the quality of firms deteriorates for those doing events at the end of waves. Cash-payment events do not seem to be driven by the availability of growth opportunities – while the dispersion in Tobin's Q does increase, there is no pattern in Tobin's Q or the internal investment opportunities of the firm. In analysis that we do not report in the tables for brevity, we analyze different sub-periods separately, and we observe that these results are much more pronounced during the 1990s compared to the 1980s.

Figure 1 illustrates the evolution of firm characteristics as the wave progresses for each individual type of event. The five points represented in each firm-characteristic graph are: no-event (the average for all firms in the same industry that do not report an event in that quarter, reported for comparison purposes), event-outside-of-wave, beginning-, middle- and end-of-wave. Goodness-of-fit tests based on the chi square statistic (i.e. contingency tables analysis) show that the distributions are different in all the graphs at the 1% significance levels.

Apart from the patterns discussed in Table 1, Figure 1 illustrates that for most measures, the events appear to be separated into two distinct categories based on the method of payment. More specifically, characteristics for firms announcing SEOs and stock-financed acquisitions

appear to move more closely together than characteristics for firms announcing cash-financed transactions. The differences in firm characteristics for cash-based and stock-based events appear to persist across all stages of the waves and are often exacerbated as the waves progress. This suggests that the firms doing different types of events have essentially different characteristics.

More specifically, all valuation measures (Tobin's Q, prior year market-adjusted stock returns, firm-specific error in market-to-book ratio, and to a lesser extent the dispersion of Tobin's Q within the firm's industry) are higher for stock-issuance events. The differences in the valuation measures with cash-based events become more pronounced as the wave progresses. These differences suggest that misvaluation if any, occurs in events that involve the issuing of stock. Firms that announce stock financed events have worse ROA (but not ROE). One difference between SEO and stock-financed acquisition firms is in their size. Firms announcing SEOs are the smallest and stock acquisition firms the largest across all stages of the waves.

We also note that cash-financed acquisitions appear consistent with a pecking order capital structure explanation. The leverage for cash-financed acquisition firms increases substantially in the course of the wave. Most of these firms may be using debt (rather than prior issues of equity) to pay for their cash-financed acquisitions. This evidence is consistent with Bharadwaj and Shivdasani (2003), who report that 70% of the cash tender offers in their sample are financed by bank debt.

Some studies have suggested that waves of different types of events may become mechanically related when firms do two transactions instead of one (for example, raising cash in an SEO in order to spend it in a cash-financed M&A, doing a stock-financed M&A and a repurchase, when the acquirer wants to pay cash but target shareholders prefer to receive stock for tax reasons (Fama and French (2001))). A priori, the evidence in Figure 1 is not consistent with these conjectures, because we show that the firms participating in waves of different types of events appear to be different both when they conduct events outside and inside the wave. Firm characteristics appear to diverge more at different stages within the wave. Therefore, although these conjectures may be consistent with how some individual firms behave, they are not strong enough to explain waves of events.

We next run cross-sectional regressions to examine the determinants of corporate events in a multivariate framework. Table 3 reports coefficients from probit models of the likelihood of

announcing an event as a function of firm characteristics in the universe of 142,000 firm-quarter observations in the U.S. market irrespective of whether the firms have participated in an event or not.<sup>5</sup> We include interactions of the firm characteristics with dummy variables indicating that the event occurred during a wave period, in the middle of the wave, and in the end of the wave. As in Table 2, we note that since several proxies are highly correlated, to avoid multicollinearity, we include only a subset of the variables examined in Table 1.

Our results are broadly consistent with those in Table 2. For the three events that involve either an issue or retirement of stock (SEOs, stock-financed acquisitions and repurchases), the dispersion of Tobin's Q within the industry increases within the wave and shrinks as the wave progresses. For cash-financed acquisitions, while the dispersion of Tobin's Q is not different within the wave from outside the wave, the dispersion does shrink as the wave progresses. Tobin's Q also shrinks as the wave progresses, though interestingly after controlling for other events, it is not significantly higher within the wave than outside it. Operating performance (ROA) is significantly lower within the wave for SEOs and stock- and cash-financed acquisitions and higher for repurchases within the waves.

For both types of stock-issuance events, prior-year market-adjusted stock returns are significantly higher with the wave than outside it and decline over time, suggesting a degree of overvaluation. However, for SEOs, internal investment opportunities (R&D/assets) are significantly higher within the wave and firm-specific error in market-to-book ratio no different from outside the wave. For stock-financed acquisitions, internal growth opportunities are significantly lower within the wave and decline further as the waves progress. Moreover firm specific error in market-to-book ratios are significantly higher within than outside the wave, suggesting that seasoned equity offerings are driven more by growth opportunities while a degree of misvaluation may occur in stock-financed acquisitions where the firms are trying to acquire external growth opportunities.

These results are consistent with Hertzell and Li (2008), who find that firms issuing equity are more overvalued and have greater growth opportunities compared to other firms. They also find that firms with greater mispricing reduce leverage and earn lower post issue abnormal

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<sup>5</sup> Logit models provided qualitatively similar results for SEOs, stock- and cash-financed M&A, but did not converge for repurchases. Consequently, we report results of probit models for all events for consistency.

returns. They are also consistent with Kim and Weisbach (2008), who examine the uses of the proceeds from seasoned equity offerings worldwide, and find that firms raising capital increase both R&D and capital expenditures following the stock issue.

The opposite pattern is evident for cash-payment events. For both cash-financed acquisitions and repurchases, market-adjusted returns are lower within the wave than outside and decline as the wave progresses, suggesting that undervalued firms undertake these events. For repurchases, the higher operating performance (ROA) within waves is also consistent with the undervaluation story. In contrast to the stock-issuance events, misvaluation factors also appear less significant in explaining cash-payment events. They are insignificant for cash-financed acquisitions and negative for repurchases, again evidence consistent with undervaluation. Finally, as in our univariate results, acquirers in cash-financed acquisitions have significantly higher leverage during waves, which declines at later stages of the wave.<sup>6</sup>

## **5. Comparing firms doing different events at the same stages of waves**

We next compare the characteristics of firms that conduct an event to those that conduct other events, conditional of the transaction being conducted outside or inside a wave and at different stages inside the wave. Our results are reported in Table 4. Within waves, consistent with our prior results, firms announcing SEOs have higher internal growth opportunities (R&D/assets and capital expenditure/assets) than firms announcing stock-financed acquisitions. This pattern does not hold outside waves. Firms announcing SEOs within waves are also smaller, have more leverage and poorer profit margins. In addition, while the two types of firms do not differ in firm-specific errors in market-to-book ratios, the dispersion of Tobin's Q within the industry is significantly smaller in SEO waves than in stock-financed merger waves, suggesting again that stock-financed acquisition waves are meant to take

Not surprisingly, in light of our prior results that suggest the repurchases are likely announced by undervalued firms with no growth opportunities, firms announcing SEOs have higher internal growth opportunities (R&D/assets and capital expenditure/assets) and Tobin's Q

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<sup>6</sup> In analysis that we do not report in tables for brevity, we estimate a series of logit models of the likelihood of conducting an event inside a wave conditional on conducting an event, and of the likelihood of conducting an event at different stages in the wave conditional on conducting an event within a wave. We also estimate ordered probit models, where the dependent variable takes on the values of one (if the firm conducts an event outside the wave), two, three and four respectively if the event is conducted in the beginning, middle, and end of the wave. In general, the results from these models are qualitatively similar to the results reported in Tables 1-3.

than firms announcing repurchases. They also have higher stock price performance, worse profit margin, and larger firm-specific errors in market-to-book ratios, suggesting repurchasing firms are undervalued. Comparing only acquisition announcements, firms that conduct stock-financed acquisitions have higher stock market performance and higher firm-specific errors in market-to-book ratios, suggesting a degree of over-valuation in stock-financed acquisitions in comparison to cash-financed acquisitions. The former also have lower profit margins or ROA, are larger, and have less leverage. Outside waves, the differences across events are largely in the same direction with some exceptions noted above, but weaker, losing statistical significance in some cases.

We next examine whether these results hold in a multivariate framework. In Table 5, we report coefficients from logit models where we estimate the likelihood of conducting one event in preference to another in samples that combine observations for two different events for comparison purposes. In column 1, among firms that conduct either of the two stock-issuance events (SEOs or stock-financed acquisitions) inside a wave, firms that conduct SEOs have significantly higher internal growth opportunities (R&D expenses/assets), Tobin's Q, operating performance (ROA), market-adjusted stock returns, and leverage. They also have lower ROE, firm-specific misvaluation error, and are located in industries with lower dispersion in Tobin's Q. This suggests that, consistent with our earlier results, firms announcing seasoned equity offerings within waves are less likely to be driven by market-misvaluation and more likely to be driven by the necessity of raising capital for internal growth opportunities. Firms that conduct stock-financed M&A appear more misvalued compared to firms that raise equity in SEOs within waves than outside waves (in column 4, there are fewer significant differences in transactions conducted outside waves, and there is no significant difference in firm-specific error in market-to-book ratio between the two types of firms).

In column 2, we compare firms that raise equity in SEOs with firms that repurchase stock inside waves of the two events. Firms that raise equity have higher growth opportunities (R&D expenses and Tobin's Q), stock price performance (market-adjusted stock returns), leverage, and lower ROA compared to firms that repurchase their stock. Interestingly, firm-specific misvaluation errors do not differ for the firms within waves but do differ outside waves (column 5, where SEO firms have a significantly higher firm-specific error compared to repurchasing firms). Finally, when we compare acquirers in stock- and cash-financed acquisition waves in column 3, firms announcing stock-financed acquisitions have lower internal growth

opportunities (R&D expenses), operating performance (ROA), and leverage. They have significantly higher market-adjusted stock returns and firm-specific misvaluation error. Overall, in line with our previous results, this suggests that firms announcing stock-financed acquisitions inside waves are more misvalued than firms announcing all other types of events. They are significantly more misvalued (and have generally worse operating performance) compared to firms doing SEOs and cash-financed M&A. Again consistent with the univariate results, differences between the events outside waves are smaller and in many cases, less significant than differences within waves.

Table 6 brings everything together and reports results from nine ordinary least squares regressions, where the dependent variables are the nine firm-characteristics (examined separately) and the explanatory variables are dummy variables for the four different types of transactions (SEOs, stock- and cash-financed M&A, repurchases), with interaction terms that indicate transactions that occur inside waves, in the middle, and in the end of waves. These specifications allow for comparisons (i) of changes in firm characteristics for the same event at different stages of waves as the waves progress, and (ii) of differences in firm characteristics across events at the same stage of waves.

Internal growth opportunities (as proxied by R&D expenses/assets) increase at later stages of SEO and repurchase waves (column 1). However, they are lower within waves and in addition, decline smoothly over the course of stock- and cash-financed acquisition waves. Firms in stock-issuance events have higher growth opportunities (Tobin's Q) compared to firms in cash-payment events (column 2). In the middle and end stages of the waves, Tobin's Q increases further for firms announcing stock-issuance events, and they deteriorate further for firms announcing cash-payment events. In column 3, the dispersion of Tobin's Q within the industry increases significantly towards later stages of stock issuance waves (SEOs and stock-financed M&A), and declines slightly for cash based events. Market adjusted stock returns show broadly similar patterns (column 4). Again, firms announcing repurchases earn the lowest returns in the prior year and this measure deteriorates for firms announcing repurchases at the end of the waves.

The regressions of firm-specific error in market to book ratios, in column 5, suggest that suggest that in general, firms announcing all types of events have significantly greater firm-

specific errors than the rest of the market. However, within waves, firm-specific error is significantly lower for both SEOs and repurchases, suggesting that over-valuation is not a significant determinant of SEO waves. However, the firm-specific error is highest for later stages in firms announcing stock-issuance events (especially for acquirers in stock-financed acquisitions). Misvaluation is lower for acquirers in cash-financed M&A and it is the lowest for firms repurchasing their shares. Towards the later stages of waves, overvaluation increases further for firms announcing stock-issuance events, and declines further for firms announcing cash-payment events.

Not surprisingly, firms doing all types of transactions have above average operating performance (ROA) in column 6. However, within waves, with the exception of stock-financed acquisitions, ROA is significantly lower for all the other three events. There is no clear pattern in ROA as the waves evolve, except for stock-financed acquisitions where firms with the highest operating performance announce stock-financed acquisitions at the beginning of waves followed by a steady decline as the wave progresses. For the cash-payment events, the magnitudes of the interaction coefficients suggest that this deterioration is only marginal for firms doing cash based events, which continue to outperform the rest of the market even at the end of the waves. Acquirers in stock-financed acquisitions are also the only firms that show deteriorating ROE at the end of the wave (column 7).

Firms within waves are significantly smaller in market capitalization than firms outside waves for all four types of waves (column 8). Stock issuance waves (SEOs and stock-financed acquisitions) begin with smaller firms and become progressively larger towards later stages of the wave. In contrast, the firms participating in cash-payment waves (cash-financed M&A, repurchases) get progressively smaller as the waves progress. Finally, firms raising equity in stock-issuance transactions have significantly lower leverage ratios within waves than outside (column 9). The pattern reverses in cash-financed acquisitions which have significantly higher leverage ratios inside the wave than outside.

## **6. Valuation effects of corporate transactions at different stages of waves**

In our final section, we report valuation effects, both short-term (around a 3-day announcement window) and long-term (over 12 months following the transaction) for firms that announce events outside waves, inside waves and at different stages of the waves.

Announcement cumulative abnormal returns (CARs) are estimated for the [-1, +1] day window around the announcement date of the event, after subtracting the return of an equally-weighted market return. One year cumulative abnormal returns (CARs) are computed with respect to a size and a book-to-market matched portfolio, formed using the sequential sort procedure employed by Rau and Vermaelen (1998). Every month, we obtain decile breakpoints for month end market capitalization of NYSE and AMEX firms listed on both CRSP and COMPUSTAT. We rank each firm on NYSE/AMEX and Nasdaq that is listed on both CRSP and COMPUSTAT into one of ten portfolios formed on the basis of these breakpoints. The size portfolios are further sorted into quintiles on the basis of the book-to-market ratio. The average monthly portfolio return for each of the 50 size and book-to-market benchmark portfolios is calculated by equally weighting the monthly returns of firms in each portfolio. Starting in the event month, for each firm, we calculate the abnormal monthly return as the difference between the firm's monthly return and the return to its benchmark portfolio. The abnormal return for the portfolio of all firms in an event sample is the equally weighted abnormal monthly return of each firm in the sample. We estimate significance levels for the monthly CARs using a bootstrapping approach (see Lyon, Barber and Tsai, 1999).

The procedure described above is designed to overcome various biases in measurement of long horizon abnormal returns. We use event studies instead of calendar time methods, since as Loughran and Ritter (2000) argue, calendar-time factor models such as the Fama-French three-factor model will have low power to identify abnormal returns for events that occur as a result of behavioral timing. If there are time-varying misvaluations that firms are capitalizing on by issuing equity or by making stock-financed acquisitions, factor models that equally weight time periods instead of equally weighting each firm will be less able to detect abnormal returns.

We use the size and book-to-market ratio benchmark since Jegadeesh (2000) finds that among a variety of benchmarks, the size and book-to-market ratio matched benchmark yields the lowest level of SEO underperformance. The size and book-to-market benchmarks are further rebalanced monthly rather than annually to accommodate changing risk characteristics of firms following a corporate event. Rau and Vermaelen (1998) document that the book to market ratios of glamour firms completing acquisitions increase sharply over the three years following the event.

We use equally weighted returns rather than value-weighted returns since equally weighted portfolio returns better capture the extent of underperformance in small firms. Brav, Geczy, and Gompers (2000) argue that the underperformance of firms issuing equity is concentrated among small firms. Loughran and Ritter (2000) argue that value-weighted returns reduce the power of a test to detect behavioral biases. We use cumulative abnormal returns (CAR), calculated by summing the abnormal monthly returns of the portfolio over time, rather than buy and hold abnormal returns (BHARs) since Fama (1998) shows that BHARs increase spuriously as the holding period increases, even when there is no abnormal return after the initial period.

Finally, we compute bias adjusted CARs by subtracting the mean CAR for the empirical distribution from the CAR for the sample firms, to correct for the measurement, new issues, skewness, and momentum biases identified by Barber and Lyon (1997) and Rau and Vermaelen (1998). These biases affect the magnitude of the abnormal returns since the empirical distribution of CARs computed using monthly rebalancing is not centered at zero (see Rau and Vermaelen, 1998, for details). The bias-adjusted CAR captures the economic magnitude of the long-horizon returns better than the unadjusted CARs without altering the statistical significance of the results.

Table 7 reports the results. In general, firms completing events earn excess returns of the same sign and magnitude as in prior literature. For example, Ritter (2003) documents that the mean percentage excess returns on SEOs from 1970-2000 is -0.9% in the year after issuance. Firms in our sample earn significant negative excess returns of -1.1% over three days and -2.7% over 12 months after the completion of the SEO. Firms announcing SEOs outside waves earn significant excess returns of -2.6% over the same 12 month period. Loughran and Vijh (1997) document annualized long horizon performance of -3.5% and +2.4% for stock- and cash-financed acquisitions respectively. Our sample firms earn 0.8% and 1% respectively over three days, and -9.9% and +0.5% respectively for the same events over the year after completing the acquisition, roughly in the same ball park. Ikenberry, Lakonishok and Vermaelen (1995) document annualized long horizon performance of +1.9% for firms announcing open-market share repurchases. Our sample firms earn significant excess returns of +2.6% around the announcement days, and +3.9% over the year after announcing the repurchase. There is no significant difference in the overall abnormal returns earned by firms within and out of waves.

Considering only events occurring *within* waves however, the picture changes dramatically. For stock-issuance events (SEOs, and stock-financed acquisitions), long-horizon performance steadily worsens as we progress through the wave. At the beginning of the wave, for example, firms completing SEOs earn insignificant excess returns of -2.9% over the year following the completion of the SEO. In contrast, firms announcing SEOs at the end of the wave earn significantly negative excess returns of -7.9% over 12 months after the completion of the SEO. The difference between the one year returns is significant at the 4% level.

Similarly, stock-financed acquirers at the beginning of waves earn insignificant announcement returns of +0.3% around the days of the announcement, and significant long-horizon excess returns of -3.8% over 12 months after the completion date. At the end of waves, they earn significantly negative excess returns of -1% at the announcement, and -23.1% over the same period. Again the differences are highly statistically significant (at better than the 5% and 1% level respectively). There is no clear pattern for cash-financed acquirers, who do not earn negative excess returns. At the announcement, these firms earn +1.3% at the beginning of waves and +0.5% at the end of waves (the difference is marginally statistically significant at the 10% level). In contrast, they earn +1.6% over 12 months when they conduct the deal at the beginning of waves and +3.3% over the same period when they conduct the deal at the end (the difference is not statistically significant).

Finally, the announcement abnormal returns are not significantly different for firms announcing repurchases at the beginning and at the end of waves (+2.4% and +3% respectively). However, similar to the pattern for stock issues and stock-financed acquisitions, the long horizon performance for firms announcing repurchases over the year after the repurchase is higher for firms announcing at the beginning of the wave, +8.5% to -0.3% respectively (the difference is statistically significant at the 1% level).<sup>7</sup>

The results in Table 7 suggest that firms undertaking events at the end of waves earn significantly lower abnormal returns in the 12 months following the event (with the exception of

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<sup>7</sup> Though we report long-horizon abnormal returns only for firms announcing repurchases in the table, we obtain similar results for the long-horizon performance of firms completing repurchases. Firms completing repurchases at the beginning and end of waves earn +6.66% and +5.48% respectively ( $p$ -values 0.01 and 0.06 respectively) over the 12 months after the completion of the repurchase. The difference is insignificant. However, since open-market share repurchases are not firm commitments, the sample size for repurchase completions is considerably smaller than the sample of repurchase announcements. Hence we do not report these numbers in the tables.

acquirers in cash-financed M&A, where the differences are not statistically significant). In combination with our earlier results that the stock-financed acquisitions were associated with higher firm-specific errors in market-to-book ratios, this suggests that stock-financed acquisitions in particular do take advantage of market misvaluations as waves progress. These results are consistent with Shleifer and Vishny (2003).

## **7. Conclusions**

It has been extensively documented that corporate events occur in waves. There is little evidence in the literature however, on whether firms engaged in these types of events differ systematically in their characteristics. In this paper, we examine whether firms participating in 34,768 corporate transactions classified as four separate types of corporate events (seasoned equity offerings or SEOs, mergers – both stock and cash-financed, and share repurchases) within waves differ in predictable patterns from firms that engage in event activity outside waves. We also examine whether firm characteristics evolve similarly as event waves progress.

Our findings suggest that waves are driven by the availability of growth opportunities and end when these opportunities disappear. In particular, we find little evidence that seasoned equity offering waves occur when rational managers try to take advantage of irrationally optimistic markets. These waves are more likely to be driven by managers issuing equity to take advantage of growth opportunities. Stock-financed acquisition waves are likely to be driven by the lack of internal growth opportunities in the firm and the availability of a large pool of targets with growth opportunities. Repurchase waves seem likely to be driven by undervalued firms. The patterns for cash-financed acquisition waves are not as clear, leaving us unable to draw clear conclusions on why these waves occur. In addition, especially for stock-financed acquisitions, the larger, less profitable firms announcing events at the end of waves earn significantly lower excess returns after the events suggesting a degree of market misvaluation appears as waves progress.

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**Table 1**

**Descriptive statistics for firms announcing different types of corporate events within and outside waves**

This table compares descriptive statistics for firms that announce corporate events within to those that announce the same event outside waves. The four events examined separately are seasoned equity offerings (SEOs), stock-financed acquisitions, cash-financed acquisitions, and repurchases. All analysis is done at the individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. R&D expenses and capital expenditure, scaled by total assets, are from Compustat and proxy for internal investment opportunities. Tobin's Q is defined as  $(\text{Total assets} + (\text{common shares outstanding} \times \text{Price close fiscal year}) - \text{Common equity} - \text{Deferred taxes}) / (\text{Total assets})$ . The within-industry Tobin's Q Score ranking is estimated as  $100 - ((\text{industry rank in year-1}) / (\text{Number of firms in industry-year})) \times 100$ . Ranking values are estimated based on quintiles (Quintile 5 is the highest value). Dispersion of Tobin's Q is estimated within the firm's industry. The three stock return measures, namely, the raw stock return, the market-adjusted return, and the alpha calculated using a 3-factor Fama-French model, are estimated over the year prior to the event. The firm-specific error in market-to-book ratio is estimated based on model 3 described in Rhodes-Kropf, Robinson and Viswanathan (2005) pp 577. Sales growth is estimated over year prior of the event. The other three proxies for operating performance are measured by net income margin before extraordinary items, the return on assets (ROA) based on operating income before interest and taxes (EBITD), and the return on equity (ROE) as net income divided by shareholders' equity. Market capitalization, from CRSP, is defined as the number of shares outstanding times the price per share in the month of announcement, and is measured in millions of dollars. Capital structure is measured by the long-term leverage ratio (i.e., long term debt divided by total assets). All variables are industry-adjusted, based on the 48 Fama-French industries except for raw and market adjusted stock returns over prior year, Fama-French 3 factor alphas over the prior year, Tobin's Q score rankings, the firm-specific error, and both dispersion variables. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively, based on a t-test of difference in means.

	SEOs			Stock-financed acquisitions			Cash-financed acquisitions			Repurchases		
	Outside wave	Inside wave	Diff. in means	Outside wave	Inside wave	Diff. in means	Outside wave	Inside wave	Diff. in means	Outside wave	Inside wave	Diff. in means
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Proxies for internal investment opportunities</i>												
R&D/Assets	0.023	0.051	***	0.028	0.016	***	0.003	0.002		0.005	0.012	***
Capital Expenditure/Assets	0.034	0.032		0.023	0.015	***	0.016	0.022	*	0.016	0.021	***
<i>Proxies for growth opportunities</i>												
Tobin's Q	1.024	2.258	***	1.797	2.701	***	0.547	0.191	***	0.352	0.181	***
Tobin's Q Score ranking within-industry	62.78	62.05		66.39	71.74	***	55.76	52.27	***	51.53	47.06	***
Dispersion of industry Tobin's Q	3.159	9.943	***	5.846	14.956	***	5.842	6.893	***	4.339	2.801	***
<i>Proxies for both growth/misvaluation</i>												
Raw stock returns over prior year	0.451	0.494		0.386	0.489	***	0.296	0.281		0.236	0.225	
Market-adjusted returns over prior year	0.306	0.300		0.209	0.278	***	0.148	0.055	***	0.075	0.004	***
FF 3 factor alpha over prior year	0.116	0.180	*	0.040	0.084	*	0.032	0.044		0.001	-0.018	*
<i>Proxies for market misvaluation</i>												
Firm-specific error	0.322	0.330		0.359	0.372		0.136	0.127		0.021	-0.015	***
<i>Proxies for operating performance</i>												
Sales growth	0.499	0.408		0.870	0.417		0.310	0.335		0.178	0.092	**
Net income margin	-1.536	-4.822		-1.519	-0.362	**	-0.036	0.035	***	-0.122	-0.011	
ROA	-0.005	-0.039	***	-0.033	-0.032		0.041	0.018	***	0.043	0.028	***
ROE	0.072	-0.014		-0.054	-0.019		-0.070	0.025		-0.898	-0.024	
<i>Control variables</i>												
Market capitalization	1,032	518	***	5,434	2,953	***	5,610	1,051	***	2,786	1,232	***
Long-term leverage ratio	0.083	0.043	***	0.040	0.015	***	0.080	0.139	***	0.031	0.035	
Observations (firm-years)	5,778	952		3,949	1,154		9,032	1,244		9,358	3,301	

**Table 2**  
**Evolution of firm characteristics as waves evolve**

This table compares statistics for firms that announce different types of corporate events as the waves evolve. The four individual types of events are seasoned equity offerings (SEOs), stock-financed acquisitions, cash-financed acquisitions, and repurchases. The analysis is done at the individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. The total number of wave quarters during the sub-period (irrespective of whether they are consecutive or not) is divided by three in order to determine the terciles that determine the beginning/middle/final of wave quarters. Variables are defined as in Table 1. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively, based on a t-test of difference in means.

	SEOs					Stock-financed M&A					Cash-financed M&A					Repurchases				
	Within wave					Within wave					Within wave					Within wave				
	Beg	Mid	End	Diff Beg vs.		Beg	Mid	End	Diff Beg vs.		Beg	Mid	End	Diff Beg vs.		Beg	Mid	End	Diff Beg vs.	
				Mid	End				Mid	End				Mid	End				Mid	End
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
<i>Proxies for internal investment opportunities</i>																				
R&D/Assets	0.028	0.059	0.064	***	***	0.010	0.027	0.010	***		0.001	0.006	0.000	**		0.013	0.012	0.011		
<i>Proxies for growth opportunities</i>																				
Tobin's Q	1.687	1.651	3.442		***	1.168	2.781	4.020	***	***	0.194	0.210	0.165			0.196	0.160	0.187		
Dispersion of Tobin's Q	2.445	7.376	20.071	***	***	9.439	18.761	16.029	***	***	3.304	3.875	14.826	**	***	2.016	2.066	4.357	***	
<i>Proxies for misvaluation</i>																				
Firm-specific error	0.269	0.366	0.353	*		0.331	0.370	0.409			0.121	0.174	0.076			0.000	-0.028	-0.016		
<i>Proxies for operating performance</i>																				
ROA	0.011	-0.047	-0.079	***	***	-0.013	-0.051	-0.028	**		0.029	0.012	0.007	*	**	0.032	0.028	0.024	**	
ROE	0.122	-0.135	-0.022	*		-0.063	0.117	-0.126			0.008	0.073	-0.017			0.020	-0.002	-0.092		
<i>Control variables</i>																				
Market capitalization	394	365	805		***	1,855	3,495	3,391	***	***	1,117	832	1,252			1,034	1,321	1,341		
Long-term leverage ratio	0.034	0.051	0.042			0.020	0.021	0.005	*		0.113	0.170	0.127	***		0.029	0.046	0.030	***	

**Table 3**  
**Determinants of the occurrence of an event inside a wave and at different stages within the wave**

This table reports logistic regressions for the occurrence of the types of corporate events within a wave, and at different stages within the wave. The four individual types of events are SEOs, stock-financed acquisitions, cash-financed acquisitions, and repurchases. All analysis is done at an individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. The total number of wave quarters during the sub-period (irrespective of whether they are consecutive or not) is divided by three in order to determine beginning/middle/final wave quarters. Variables are defined as in table 1. Inside wave, middle of wave, and end of wave, are dummy variables indicating that event occurs inside a wave, in the middle of the wave, and at the end of the wave respectively. Beta coefficients and p-values (in parenthesis) are reported. Intercepts are estimated but not reported. The p-value is computed using the Eicker-White-Sandwich heteroskedastic robust standard errors. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively.

	SEOs (1)	Stock-financed M&A (2)	Cash-financed M&A (3)	Repurchases (4)
<i>Proxies for internal investment opportunities</i>				
R&D/Assets	3.167 (0.000)***	1.894 (0.000)***	2.281 (0.000)***	3.161 (0.000)***
R&D/Assets × inside wave	1.092 (0.090)*	-5.043 (0.000)***	-2.372 (0.002)***	4.752 (0.000)***
R&D/Assets × middle of wave	-3.636 (0.000)***	-2.199 (0.004)***	0.814 (0.217)	-2.045 (0.001)***
R&D/Assets × end of wave	-0.919 (0.102)	0.062 (0.933)	-4.215 (0.000)***	-2.767 (0.000)***
<i>Proxies for growth opportunities</i>				
Tobin's Q	-0.010 (0.160)	0.046 (0.003)***	-0.009 (0.402)	0.028 (0.005)***
Tobin's Q × inside wave	0.011 (0.664)	-0.028 (0.149)	-0.001 (0.945)	-0.002 (0.937)
Tobin's Q × middle of wave	-0.025 (0.487)	-0.045 (0.043)**	-0.126 (0.000)***	-0.189 (0.000)***
Tobin's Q × end of wave	-0.086 (0.010)**	-0.054 (0.022)**	0.014 (0.433)	-0.116 (0.025)**
Dispersion of Tobin's Q within industry	-0.001 (0.480)	0.014 (0.000)***	0.024 (0.000)***	0.026 (0.000)***
Dispersion of Tobin's Q within industry × inside wave	0.279 (0.000)***	0.059 (0.000)***	0.002 (0.518)	0.037 (0.000)***
Dispersion of Tobin's Q within industry × middle of wave	-0.045 (0.006)***	-0.040 (0.000)***	-0.026 (0.000)***	-0.040 (0.000)***
Dispersion of Tobin's Q within industry × end of wave	-0.264 (0.000)***	-0.019 (0.000)***	-0.012 (0.000)***	-0.025 (0.000)***
<i>Proxies for growth/misvaluation</i>				
Market-adjusted stock returns (prior year)	0.549 (0.000)***	0.125 (0.000)***	0.314 (0.000)***	0.003 (0.920)
Market-adjusted stock returns (prior year) × inside wave	0.267 (0.007)***	0.717 (0.000)***	-0.174 (0.056)*	-0.378 (0.000)***
Market-adjusted stock returns (prior year) × middle of wave	-0.608 (0.000)***	0.401 (0.000)***	-0.119 (0.182)	0.341 (0.001)***
Market-adjusted stock returns (prior year) × end of wave	0.037 (0.690)	-0.547 (0.000)***	-0.252 (0.005)***	-0.421 (0.000)***

	SEOs (1)	Stock-financed M&A (2)	Cash-financed M&A (3)	Repurchases (4)
<i>Proxies for misvaluation</i>				
Firm-specific error	0.321 (0.000)***	0.384 (0.000)***	-0.071 (0.037)**	-0.342 (0.000)***
Firm-specific error × inside wave	0.038 (0.645)	0.523 (0.000)***	0.119 (0.140)	-0.460 (0.000)***
Firm-specific error × middle of wave	0.040 (0.669)	-0.084 (0.392)	0.110 (0.176)	0.383 (0.000)***
Firm-specific error × end of wave	-0.136 (0.139)	-0.093 (0.346)	0.194 (0.015)**	0.336 (0.000)***
<i>Proxies for operating performance</i>				
ROA	0.022 (0.860)	-0.306 (0.019)**	3.321 (0.000)***	3.729 (0.000)***
ROA × inside wave	-1.585 (0.000)***	-1.562 (0.000)***	-1.468 (0.005)***	4.712 (0.000)***
ROA × middle of wave	0.175 (0.691)	1.058 (0.019)**	-0.520 (0.161)	-1.674 (0.002)***
ROA × end of wave	0.330 (0.454)	-0.427 (0.343)	-2.445 (0.000)***	-1.556 (0.005)***
ROE	0.000 (0.000)***	0.000 (0.008)***	0.000 (0.067)*	0.000 (0.000)***
ROE × inside wave	0.028 (0.816)	0.382 (0.011)**	0.034 (0.677)	-0.190 (0.014)**
ROE × middle of wave	-0.065 (0.208)	-0.343 (0.014)**	0.028 (0.404)	0.045 (0.151)
ROE × end of wave	0.071 (0.173)	0.344 (0.014)**	-0.023 (0.489)	-0.033 (0.299)
<i>Control variables</i>				
Market capitalization	-0.005 (0.001)***	0.005 (0.000)***	0.007 (0.000)***	0.001 (0.024)**
Market capitalization × inside wave	-0.069 (0.124)	0.039 (0.000)***	0.003 (0.285)	0.065 (0.000)***
Market capitalization × middle of wave	-0.147 (0.000)***	-0.035 (0.000)***	-0.006 (0.012)**	-0.038 (0.000)***
Market capitalization × end of wave	0.012 (0.001)***	-0.002 (0.398)	-0.002 (0.389)	-0.045 (0.004)***
Long-term leverage ratio	2.244 (0.000)***	1.008 (0.000)***	2.663 (0.000)***	0.727 (0.000)***
Long-term leverage ratio × inside wave	-0.658 (0.018)**	-1.633 (0.000)***	0.959 (0.000)***	2.625 (0.000)***
Long-term leverage ratio × middle of wave	-1.933 (0.000)***	-0.770 (0.035)**	-1.658 (0.000)***	-0.703 (0.001)***
Long-term leverage ratio × end of wave	-0.729 (0.009)***	-0.862 (0.019)**	-1.731 (0.000)***	-1.174 (0.000)***
Pseudo R <sup>2</sup>	0.26	0.13	0.14	0.15
Observations	142,000	142,000	142,000	142,000

**Table 4**  
**Comparison of firm characteristics across different types of corporate events**

This table reports descriptive statistics for firms that announce different types of corporate events both within and outside waves. The four individual types of events are seasoned equity offerings (SEOs), stock-financed acquisitions, cash-financed acquisitions, and repurchases. The analysis is done at the individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. Variables are defined as in Table 1. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively, based on a t-test of difference in means. Difference A-B means average for the first event minus average for the second event.

	Difference in means within waves (A-B)						Difference in means outside waves (A-B)					
	Stock issuance events (SEOs and Stock-financed M&A)		Stock-related events (SEOs and Repurchases)		Organizational events (Stock- and Cash-financed acquisitions)		Stock issuance events (SEOs and Stock-financed M&A)		Stock-related events (SEOs and Repurchases)		Organizational events (Stock- and Cash-financed acquisitions)	
<i>Proxies for internal investment opportunities</i>												
R&D/Assets	0.035	***	0.039	***	0.013	***	-0.005	**	0.018		0.025	***
Capital Expenditure/Assets	0.017	***	0.011	***	-0.007		0.011	***	0.018		0.007	***
<i>Proxies for growth opportunities</i>												
Tobin's Q	-0.444		2.077	***	2.510	***	-0.772	***	0.672	**	1.250	***
Tobin's Q Score ranking within-industry	-9.69	***	14.99	***	19.47	***	-3.61	***	11.26	***	10.63	***
Dispersion of industry Tobin's Q	-5.013	***	7.143	***	8.063	***	-2.687	***	-1.180	***	0.004	
<i>Proxies for both growth/misvaluation</i>												
Raw stock returns over prior year	0.005		0.269	***	0.208	***	0.065	***	0.215		0.090	***
Market-adjusted returns over prior year	0.022		0.296	***	0.223	***	0.096	***	0.231		0.061	***
FF 3 factor alpha over prior year	0.096	**	0.199	***	0.040	*	0.075	***	0.115		0.008	
<i>Proxies for market misvaluation</i>												
Firm-specific error (Model 3 RK-R-V)	-0.041		0.345	***	0.244	***	-0.037	**	0.301		0.223	***
<i>Proxies for operating performance</i>												
Sales Growth	-0.009		0.317	***	0.082		-0.371		0.320	**	0.560	
Net Income margin	-4.460	**	-4.811	**	-0.397	***	-0.018		-1.414	***	-1.483	***
ROA	-0.007		-0.067	***	-0.050	***	0.028	***	-0.048		-0.073	***
ROE	0.005		0.010		-0.044		0.126		0.971		0.016	
<i>Control variables</i>												
Market capitalization	-2,435	***	-714	***	1,903	***	-4,402	***	-1,754		-176	
Long-term leverage ratio	0.028	***	0.007		-0.123	***	0.044	***	0.052		-0.041	***

**Table 5**  
**How firm characteristics differ across events for within and outside waves**

This panel reports logistic regressions for the occurrence of the types of corporate events within a wave, and at different stages within the wave. The four individual types of events are SEOs, stock-financed M&A, cash-financed M&A, and Repurchases. SEOs and stock-financed acquisitions are classified as stock issuance events, SEOs, seasoned equity offerings and repurchases are classified as stock-related events, while stock- and cash—financed acquisitions are classified as organizational events. All analysis is done at an individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. The total number of wave quarters during the sub-period (irrespective of whether they are consecutive or not) is divided by three in order to determine beginning/middle/final wave quarters. Variables are defined as in Table 1. Beta coefficients and p-values (in parenthesis) are reported. Intercepts are estimated but not reported. The p-value is computed using the Eicker-White-Sandwich heteroskedastic robust standard errors. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively.

Sample consists of:	Within wave			Outside wave		
	Stock issuance events (SEOs and Stock-financed M&A)	Stock-related events (SEOs and Repurchases)	Organizational events (Stock- and Cash-financed acquisitions)	Stock issuance events (SEOs and Stock-financed M&A)	Stock-related events (SEOs and Repurchases)	Organizational events (Stock- and Cash-financed acquisitions)
Estimated likelihood of:	SEO	SEO	Stock-financed M&A	SEO	SEO	Stock-financed M&A
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Proxies for internal investment opportunities</i>						
R&D/Assets	8.566 (0.000)***	2.036 (0.006)***	-3.212 (0.042)**	0.447 (0.166)	2.432 (0.000)***	3.150 (0.000)***
<i>Proxies for growth opportunities</i>						
Tobin's Q	0.086 (0.005)***	0.232 (0.000)***	0.000 (0.998)	-0.060 (0.013)**	-0.021 (0.439)	0.125 (0.000)***
Dispersion of Tobin's Q within industry	-0.020 (0.000)***	0.016 (0.000)***	0.023 (0.000)***	-0.022 (0.000)***	-0.020 (0.000)***	-0.008 (0.000)***
<i>Proxies for both growth/misvaluation</i>						
Market-adjusted stock returns (prior year)	0.434 (0.002)***	1.341 (0.000)***	0.833 (0.001)***	0.421 (0.000)***	0.763 (0.000)***	-0.013 (0.786)
<i>Proxies for market misvaluation</i>						
Firm-specific error	-0.475 (0.004)***	0.133 (0.274)	0.471 (0.008)***	-0.055 (0.345)	0.624 (0.000)***	0.394 (0.000)***
<i>Proxies for operating performance</i>						
ROA	2.593 (0.002)***	-3.913 (0.000)***	-3.668 (0.025)**	0.098 (0.604)	-2.465 (0.000)***	-2.321 (0.000)***
ROE	-0.400 (0.075)*	-0.022 (0.719)	0.028 (0.942)	0.019 (0.564)	0.001 (0.000)***	-0.023 (0.347)
<i>Control variables</i>						
Market capitalization	-0.286 (0.000)***	-0.069 (0.013)**	0.009 (0.107)	-0.030 (0.000)***	-0.035 (0.001)***	-0.002 (0.030)**
Long-term leverage ratio	4.223 (0.000)***	0.847 (0.012)**	-5.513 (0.000)***	1.734 (0.000)***	2.420 (0.000)***	-0.820 (0.000)***
Pseudo R <sup>2</sup>	0.13	0.13	0.13	0.05	0.10	0.06
Observations	1,508	3,260	1,361	7,099	11,836	10,038

**Table 6**

**Regressions of characteristics for firms conducting corporate events outside, inside, in the middle and in the end of waves**

This panel reports ordinary least squares regressions of firm characteristics on dummy variables for the occurrence of the types of corporate events within a wave, and at different stages within the wave. The four individual types of events are SEOs, stock-financed acquisitions, cash-financed acquisitions, and repurchases. SEOs and stock-financed acquisitions are classified as stock issuance events, SEOs, seasoned equity offerings and repurchases are classified as stock-related events, while stock- and cash—financed acquisitions are classified as organizational events. All analysis is done at an individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. The total number of wave quarters during the sub-period (irrespective of whether they are consecutive or not) is divided by three in order to determine beginning/middle/final wave quarters. Variables are defined as in Table 1. Inside wave, middle of wave, and end of wave, are dummy variables indicating that event occurs inside a wave, in the middle of the wave, and at the end of the wave respectively. Beta coefficients and p-values (in parenthesis) are reported. Intercepts are estimated but not reported. The p-value is computed using the Eicker-White-Sandwich heteroskedastic robust standard errors. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively.

	R&D/Assets	Tobin's Q	Dispersion of Tobin's Q	Market-adjusted stock returns	Firm-specific error	ROA	ROE	Market capitalization	Long-term leverage ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SEO	0.000 (0.876)	0.363 (0.000)***	-1.024 (0.000)***	0.287 (0.000)***	0.347 (0.000)***	0.067 (0.000)***	0.167 (0.123)	-0.010 (0.906)	0.035 (0.000)***
SEO × Inside wave	0.005 (0.343)	0.141 (0.529)	-10.853 (0.000)***	-0.055 (0.045)**	-0.105 (0.000)***	-0.029 (0.002)***	-0.204 (0.213)	-2.204 (0.000)***	-0.043 (0.000)***
SEO × MID wave	0.027 (0.000)***	0.457 (0.000)***	6.112 (0.000)***	0.014 (0.397)	0.112 (0.000)***	0.018 (0.013)**	0.145 (0.267)	0.486 (0.211)	0.000 (0.965)
SEO × END wave	0.041 (0.000)***	2.412 (0.000)***	36.864 (0.000)***	0.108 (0.000)***	0.210 (0.000)***	-0.016 (0.088)*	0.380 (0.126)	3.943 (0.003)***	0.001 (0.876)
Stock-financed M&A	0.001 (0.697)	1.074 (0.000)***	0.145 (0.570)	0.195 (0.000)***	0.373 (0.000)***	0.038 (0.000)***	0.030 (0.780)	4.480 (0.000)***	-0.009 (0.001)***
Stock-financed M&A × Inside wave	-0.010 (0.001)***	0.407 (0.156)	0.454 (0.577)	0.046 (0.039)**	-0.026 (0.296)	0.020 (0.056)*	0.360 (0.180)	-3.527 (0.000)***	-0.034 (0.000)***
Stock-financed M&A × MID wave	-0.011 (0.000)***	0.291 (0.093)*	8.212 (0.000)***	0.018 (0.275)	0.058 (0.005)***	-0.025 (0.000)***	-0.929 (0.170)	0.169 (0.818)	0.014 (0.012)**
Stock-financed M&A × END wave	-0.014 (0.000)***	0.408 (0.049)**	3.049 (0.000)***	0.053 (0.002)***	-0.012 (0.565)	-0.030 (0.000)***	-0.183 (0.084)*	2.214 (0.000)***	0.012 (0.024)**
Cash-financed M&A	-0.022 (0.000)***	-0.196 (0.000)***	0.214 (0.127)	0.128 (0.000)***	0.151 (0.000)***	0.114 (0.000)***	0.042 (0.607)	4.494 (0.000)***	0.032 (0.000)***
Cash-financed M&A × Inside wave	0.009 (0.000)***	0.025 (0.768)	0.337 (0.361)	-0.033 (0.058)*	0.039 (0.087)*	-0.023 (0.000)***	0.171 (0.451)	-3.650 (0.000)***	0.040 (0.000)***
Cash-financed M&A × MID wave	-0.012 (0.000)***	-0.304 (0.000)***	-2.056 (0.000)***	-0.041 (0.029)**	-0.044 (0.051)*	0.001 (0.839)	0.136 (0.514)	-0.672 (0.004)***	0.010 (0.147)
Cash-financed M&A × END wave	-0.014 (0.000)***	-0.477 (0.000)***	0.664 (0.147)	-0.048 (0.004)***	-0.051 (0.031)**	0.000 (0.970)	0.133 (0.327)	-0.649 (0.011)**	0.026 (0.000)***
Repurchase	-0.019 (0.000)***	-0.373 (0.000)***	-0.712 (0.000)***	0.051 (0.000)***	0.039 (0.000)***	0.115 (0.000)***	-0.821 (0.405)	1.571 (0.000)***	-0.018 (0.000)***
Repurchase × Inside wave	0.003 (0.024)**	-0.016 (0.730)	-2.092 (0.000)***	-0.031 (0.003)***	-0.030 (0.018)**	-0.011 (0.001)***	1.060 (0.278)	-0.528 (0.026)**	0.004 (0.231)
Repurchase × MID wave	0.012 (0.000)***	-0.333 (0.000)***	-1.794 (0.000)***	-0.035 (0.004)***	-0.022 (0.117)	0.012 (0.016)**	-0.191 (0.449)	-1.901 (0.000)***	-0.008 (0.043)**
Repurchase × END wave	0.007 (0.000)***	-0.168 (0.001)***	1.871 (0.000)***	-0.073 (0.000)***	-0.006 (0.628)	-0.011 (0.024)**	-0.134 (0.181)	-1.411 (0.000)***	-0.003 (0.422)
Pseudo R <sup>2</sup>	0.001	0.001	0.071	0.011	0.018	0.001	0.000	0.012	0.003
Observations	179,791	184,486	207,375	174,140	176,399	182,028	187,067	197,496	186,759

**Table 7**

**Short- and long-horizon stock returns for firms conducting corporate events inside and outside waves.**

Short-term cumulative-abnormal-returns (CARs) surrounding the announcement of the five types of corporate events for the firms outside a wave, inside a wave, and at three stages during the wave (beginning, middle and end of wave). The CARs are estimated with a window [-1, +1] around the announcement date of the event. The Cumulative Return is estimated after subtracting the return of an equally-weighted market return. All analysis is done at the firm level. Waves are defined separately for the 1980-1990 and 1991-2003 sub-periods. The total number of wave quarters during the sub-period (irrespective of whether they are consecutive or not) is divided by three in order to determine beginning/middle/final wave quarters. We also consider gaps between non-consecutive wave quarters as part of the wave and take them into account when deciding the break points for beginning/middle/end parts of waves. Long-horizon CARs are computed with reference to a size- and book-to-market-based benchmark portfolio, over the three years after the announcement of the event. Abnormal returns are reported for months 1-12 after the event. Month 0 is the event completion date according to SDC, except for repurchases where month 0 is the event announcement date. The size and B/M matched portfolios are constructed using the sequential sort procedure employed by Rau and Vermaelen (1998). The abnormal returns are adjusted for biases by subtracting the mean of the empirical distribution (computed through bootstrapping) from the CAR. P-values of the CARs (reported in parentheses) of each sub-sample are computed with respect to the empirical distribution generated by the bootstrap procedure. The p-value for the difference is computed using the Wilcoxon rank sum test. The table reports the total number of firm-years in our whole sample. The asterisks \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels respectively, based on a t-test of difference in means.

	SEO			Stock-financed M&A			Cash Financed M&A			Repurchases		
	N	Days [-1,+1]	Months [+1,+12]	N	Day [-1,+1]	Months [+1,+12]	N	Day [-1,+1]	Months [+1,+12]	N	Day [-1,+1]	Months [+1,+12]
All events	6,574	-1.1%	-2.7% (0.00)	5,145	0.8%	-9.9% (0.00)	9,849	1.0%	0.5% (0.14)	12,229	2.6%	3.9% (0.00)
Outside wave	5,560	-1.1%	-2.6% (0.00)	3,921	1.0%	-8.6% (0.00)	8,567	1.0%	0.4% (0.23)	8,829	2.6%	4.1% (0.00)
Inside wave	1,014	-1.3%	-2.9% (0.05)	1,224	0.1%	-14.3% (0.01)	1,282	0.6%	1.6% (0.12)	3,400	2.6%	3.3% (0.00)
P-value for difference (inside vs outside)		>0.10	>0.10		<0.01***	>0.10		<0.01***	>0.10		>0.10	>0.10
Beginning of wave	319	-1.2%	-2.9% (0.13)	389	0.3%	-3.8% (0.09)	251	1.3%	1.6% (0.27)	1,141	2.4%	8.5% (0.00)
Middle of wave	275	-1.0%	4.4% (0.09)	398	0.9%	-15.5% (0.00)	397	0.4%	-1.6% (0.22)	900	2.4%	2.2% (0.11)
End of wave	420	-1.5%	-7.9% (0.00)	437	-1.0%	-23.1% (0.00)	634	0.5%	3.3% (0.03)	1,359	3.0%	-0.3% (0.45)
P-value for difference (beg vs end)		>0.10	0.04**		<0.05**	0.00***		<0.10*	0.22		>0.10	0.00***

**Figure 1**  
**Evolution of firm characteristics during waves**

Each panel reports the evolution of firm characteristics for five subsamples: No event (the average for all firms in the same industry that do not report an event in that quarter), outside wave, inside wave (beginning, middle, and end). The four individual types of events are SEOs, stock-financed acquisitions, cash-financed acquisitions, and repurchases. Analysis is done at the individual firm level. Waves are defined separately for the 1980-1990 and 1991-2004 sub-periods. All variables are industry-adjusted based on the 48 Fama-French industries except for the market-adjusted returns over the prior year, the firm specific error based on model 3 of RK-R-V, and the standard deviation of the within-industry Tobin's q. Chi-square used in goodness-of-fit tests show that the distributions are different in all the graphs at the 1% significance levels.

