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Corporate Event Waves

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Abstract

Corporate events happen in waves. In this paper, we examine the relationship between five different types of corporate event waves (mergers, IPOs, SEOs, stock repurchases, and debt issues) using a comprehensive dataset of more than 264,000 corporate transactions over the 25-year period 1980-2004. Our results show considerable overlap between all types of waves, especially during the 1990s. The general pattern seems to start with new issue waves (SEO and IPO), followed by cash- and stock-financed M&A waves, followed in turn by repurchase and debt issue waves. Merger waves continue well after SEO and IPO waves have ended. There is also considerable overlap between stock-financed M&A and stock repurchase waves, suggesting that most stock repurchases in waves occur when the market is overvalued. Overall, our results are most consistent with the cascade explanation of waves.

Keywords: Merger waves; new issue waves; corporate event cycles

JEL Classification: G14; G34; G35

I. Introduction

It has been extensively documented that corporate events occur in waves. This is true for mergers (Mitchell and Mulherin, 1996; Weston, Mitchell, and Mulherin, 2004; Andrade, Mitchell, and Stafford, 2004; Rhodes-Kropf, Robinson, and Viswanathan, 2005; Harford, 2005; Dong, Hirshleifer, Richardson, and Teoh, 2006), divestitures (Mulherin and Boone, 2000; Sudarsanam, 2003), initial public offerings (IPOs) (Maksimovic and Pichler, 2001; Lowry, 2003), seasoned equity offerings (SEOs) (Lucas and McDonald, 1990; Choe, Masulis and Nanda, 1993; Bayless and Chaplinsky, 1996), and stock repurchases (Dittmar and Dittmar, 2003).

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. In the first, an external shock – technological, regulatory or economic – affects the industry and subsequently causes a wave. In the second, markets irrationally place a higher value on some industries than their fundamentals warrant. Rational managers take advantage of these misvaluations by taking their firms public, issuing equity or making stock-financed acquisitions. However, it is difficult to choose between the two theories with different authors finding evidence for different explanations. Brealey, Myers, and Allen (2006) go so far as to describe the occurrence of merger waves as one of their ten currently unsolved problems in finance. One reason for the lack of consensus in the literature is that every empirical study so far has examined individual types of waves separately.

In this paper, we examine the relationship between five different types of corporate event waves (mergers, IPOs, SEOs, stock repurchases, and debt issues) using a comprehensive dataset of corporate transactions over the 25-year period 1980-2004. Specifically, our sample consists of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004. We use the commonalities between the different types of events to develop empirical explanations of why waves might occur.

We classify corporate event waves into five major categories, on the basis of three dimensions: information, market rationality, and manager rationality. They are summarized in

Table 1. The first two types of waves assume perfect and symmetric information between managers and markets. They also assume that both markets and managers are rational. The last three types of waves relax the assumption of perfect and symmetric information. The last two waves also relax the assumptions of manager and market rationality.

A *neoclassical* waves occurs when an external shock hits a particular industry. This shock may be technological, regulatory, or economic. An example of an industry being affected by a technological shock is the computer industry affected by the development of the Internet in 1998. An example of a regulatory shock is the deregulation of banks in 1985 allowing interstate banking, particularly in California. An economic shock affected the steel industry in 1997 when prices fell following a collapse in demand from Asia. These shocks force large scale reallocation of assets and waves occur in response to the need for reallocation. Neoclassical waves happen for efficiency reasons. Consequently, we should see waves of all types - mergers, new issues, debt issues - occurring together. For example, SEO and IPO waves should occur since firms will need to raise cash to take advantage of the potential growth opportunities. Since there is no misvaluation, stock and cash mergers should also happen at the same time and for the same reason.

Minnow waves occur when, as in neoclassical waves, external shocks affect particular industries. However, large firms are prone to bureaucratic and other problems and consequently will not be able to take advantage of these shocks with the same speed as younger firms. Consequently, in minnow waves, IPO waves will occur before merger waves. Merger waves occur when the tiny firms (minnows) going public are later swallowed by the larger firms in the same industry. Neither of these types of waves will include stock repurchase waves.

Pecking order waves are similar to neoclassical and the minnow waves in that they occur after an external shock. They also assume that managers and markets are rational. However, managers have more information than the market. As in a Myers-Majluf (1984) framework, they will be reluctant to issue stock to take advantage of growth opportunities. Consequently, in pecking order waves, waves of acquisitions financed by internal cash or debt and issues of debt will occur before other types of waves.

In contrast to the wave types above, *stock-market driven* waves (Shleifer and Vishny, 2003) occur when markets become irrational. Irrational markets will value firms at above fundamental values. Rational managers will attempt to take advantage of these misvaluations.

Consequently, stock market driven waves will be characterized by correlations between waves that involve stock – for example, SEOs, IPOs and stock-financed acquisition waves should all happen at similar points in time. Similarly, cash-financed acquisition and repurchase waves should not happen at the same time as stock-financed waves.

As in stock-market driven waves, *cascade* waves¹ occur when managers and markets assume a high potential for growth. This does not mean that either of them is irrational - the growth opportunities may actually exist following a technological shock. If the market is irrational, as in stock-market driven waves, rational managers choose to take advantage of this misvaluation by issuing stock and getting cash in exchange. Alternatively, if the market is rational, rational managers raise cash to take advantage of growth opportunities. These issues are rewarded by the market with both managers and market participants revising upwards the potential of the growth opportunity. Through a cascade mechanism, as in Bikhchandani, Hirshleifer, and Welch (1992), both markets and managers eventually overestimate the probability of the growth opportunity, becoming over-optimistic. At this point in time, managers might actually believe their firms are undervalued, leading them to buy back shares or to make debt issues. Early parts of cascade waves can therefore be driven either by rational managers taking advantage of market misvaluation to issue over-valued stock or by rational managers issuing correctly valued stock to invest in a growth opportunity. Later parts of cascade waves are driven by market and manager over-optimism. This explanation suggests that stock issue waves should precede repurchase waves.

What about acquisitions? The cascade explanation suggests they will occur after stock issue waves. The reason for this is straightforward. While both SEOs and stock-financed acquisitions involve an issue of stock, stock-financed acquisitions involve getting in exchange, a target company with uncertain value, instead of cash. Cash is easy to value. The target firm is not as simple. As Rhodes-Kropf and Viswanathan (2004) argue, the acquiror is concerned whether the valuation of the target firm is inflated by market misvaluation. If the wave was driven solely by misvaluation, it is easy for managers to see the degree of misvaluation and simply refuse to buy a target with an inflated value. The problem is that the manager also places a value on the probability that there are potential growth opportunities. As markets become hotter, acquirors are

¹ This explanation is based on Brealey, Myers, and Allen (2006) who postulate that merger waves happen because of cascades.

no longer able to distinguish between the over-valuation of target firms and the potential for growth opportunities. Consequently these managers ignore their private information about potential misvaluation and acquire target firms. The method of payment should not matter since the acquirors are convinced that there is no misvaluation in the market. Consequently, the cascade explanation predicts that stock issue waves will be followed by merger waves which in turn will be followed by repurchase waves and debt issue waves. It also makes predictions on the behavior of firms within each type of wave – if the market is rational for example, then the earliest part of stock issue waves should be positively related to potential growth opportunities. Later parts of these waves should be more related to misvaluation.

Our results show considerable overlap between all types of waves, especially during the 1990s. However, waves do not overlap completely. Stock issuing (SEO and IPO) waves start first, followed by cash-financed M&A, stock repurchases, stock-financed M&A, and finally debt waves. Stock-financed M&A waves continue well after SEO and IPO waves have ended, and they are the last waves to end. The number of mergers and acquisitions dwarfs the number of initial public offerings, suggesting that it is not only the small IPO firms that are acquired by later acquirors. In addition, there is considerable overlap between stock-financed M&A and stock repurchase waves, suggesting that most stock repurchases occur when the market is overvalued. Overall, our results for the waves in the 1980-1990 periods are not consistent with the characteristics of *pecking order*, *minnow* or *stock-market driven* waves. Over this period, the regularities between waves of different corporate events that we report are most consistent with the characteristics of cascade waves.

We do not rule out the hypothesis that the *neoclassical* explanation may have played a significant role in starting the waves of the 1990s - most of the industries that we identify as exhibiting the highest activity experienced technological shocks or deregulation in this period. In addition, the earliest part of stock issue waves are positively related to subsequent capital expenditure. However later parts of the waves are unrelated to subsequent capital expenditure. In addition, the returns to the market prior to the events are significant in predicting the occurrence of the wave, suggesting that the market and managers became over-optimistic about the potential for growth towards the second part of the decade. To the best of our knowledge, this is the only paper that has examined the commonalities between different types of corporate event waves to draw conclusions as to what factors drive event waves.

The paper is organized as follows. The next section discusses prior evidence on the corporate event waves. Section 3 describes the data. Section 4 reports our empirical results. Section 5 concludes.

2. Prior evidence on corporate event waves

2.1. The neoclassical explanation

Gort (1969) is one of the first papers to argue that corporate event waves occur during periods of dramatic economic changes. These changes are due to shocks to industry 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 the 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 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. 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. Similarly, IPO waves may be caused by increases in expected aggregate profitability related to business cycles and by increases in prior uncertainty about the difference between post-IPO profitability and total market profitability (Pástor and Veronesi, 2005).

In the context of our study, the neoclassical explanation implies that new issue waves (with firms issuing stock to raise money for new investment, either through an IPO or an SEO), merger waves (for both stock and cash), partial firm acquisitions (for both stock and cash) and repurchases (if the market believes the firms are undervalued) should spike together in time.

Other papers have investigated specifically what shocks might cause corporate event waves. Broadly, there are three major streams of literature arguing that shocks can be driven by changes in technology (or deregulation), changes in capital liquidity or time-varying costs of

capital. These explanations are not mutually exclusive. For example, a technological or deregulatory shock can also impact the capital liquidity or the cost of capital of the firm.

2.1.1. Technological shocks/Supply shocks/Deregulation

Several authors have argued that the shocks to industry structure postulated by the neo-classical explanation, are technological shocks, supply shocks or de-regulation (Andrade, Mitchell and Stafford, 2001; Andrade and Stafford, 2004; Mitchell and Mulherin, 1996; Mulherin and Boone, 2000; Weston, Mitchell and Mulherin, 2004; Sudarsanam, 2003; Jensen, 1993). These have also been cited as contributing factors to divestiture waves (Mulherin and Boone, 2000; Harford, 2005).

2.1.2. Capital liquidity

Sudarsanam (2003) documents that divestiture waves coincide with merger waves and make up 20-40% of total merger activity. Firms are more likely to divest segments operating in industries with a more liquid market for corporate assets (Schliengemann, Stulz and Walkling, 2002). Therefore, Harford (2005) argues that changes in capital liquidity may also behave like an exogenous shock in triggering waves. Specifically, Harford (2005) argues that merger waves require both an economic motivation for transactions (economic, regulatory or technological industry shocks) and low transactions costs (capital liquidity that accompanies economic expansions and the relaxation of financing constraints). Consistent with the capital liquidity argument, Eisfeldt and Rampini (2005) document that capital liquidity is pro-cyclical (i.e. the costs or frictions of reallocating capital are counter-cyclical). Lowry (2003) argues that changes in IPO volume are caused by changes in aggregate demand for capital.

2.1.3. Cost of capital

Another factor that might trigger or propagate merger and IPO waves is a time-varying cost of capital. Merger waves have been shown to coincide with high stock prices, low interest rates and narrow risk premiums (Weston, Mitchell, and Mulherin, 2004). Golbe and White

(1988) find a negative relationship between merger volume and real interest rates. Similarly, IPO waves may be caused by declines in expected market returns (Pástor and Veronesi, 2005). Venture capitalists appear to take firms public at market peaks and rely on private financing when valuations are lower (Lerner, 1994).

Cost of capital arguments have also been advanced to explain debt and equity financing. Bonds are substituted for equity when the stock market is depressed and permanent financing is postponed when long-term rates are expected to fall (Taggart, 1977). Both bond issuance and equity issuance have been shown to cluster in time (Marsh, 1982). Firms issue equity (instead of debt) in periods when they face less adverse selection costs (Choe, Masulis and Nanda, 1993). Furthermore, evidence supports the existence of “windows of opportunity” for equity issuance that result – at least partly – from reduced levels of asymmetric information (Lucas and McDonald, 1990; Bayless and Chaplinsky, 1996).

Finally, two more studies advance cost of capital arguments behind merger and IPO waves. Hubbard and Palia (1999) postulate an internal capital markets explanation for the conglomerate merger wave of the 1960s. Their evidence suggests that in diversifying acquisitions, internal capital markets may have been expected to overcome the deficiencies of external capital markets. Lerner, Shane, and Tsai (2003) show that in periods of diminished public market financing, small biotechnology firms fund R&D through alliances with major pharmaceutical corporations rather than with publicly raised funds. Such agreements are also more likely to be renegotiated when market conditions improve.

2.1.4. Other neo-classical explanations of corporate event waves

Three additional neoclassical explanation-related rationales behind merger waves have also been advanced. Gorton, Kahl and Rosen (2005) argue that since managers may have private benefits of control, they may engage in defensive mergers (in order to preserve these private benefits of control) *prior* to technological or regulatory regime changes which would create opportunities for efficient mergers.

Holmström and Kaplan (2001) identify changes in corporate governance as one of the “shocks” behind the merger waves of the 1980s and 1990s. More specifically, higher

institutional ownership and the increasing importance of capital markets facilitate mergers that correct the wedge between actual and potential performance.

Finally, Persons and Warther (1997) suggest that merger and LBO waves occur because the adoption of financial innovations by other firms reveals information about the innovation's value from observing the experience of early adopters. Maksimovic and Pichler (2001) make similar arguments for IPO waves. They suggest that firms going public make a trade-off between technological and competitive risks. In industries that experience technological innovations, this trade-off affects the timing of private offerings. IPOs herd when the most significant risk is new-entry risk. On the other hand, if technology risk is more significant, some firms may wait until the uncertainty about the new technology is resolved before going public.

2.2. Market misvaluation

A second stream of literature suggests 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 Chen (2004) decompose the M/B 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.

Similar arguments have been made about IPO waves. Pagano, Panetta and Zingales (1998) for example, suggest a sectoral mispricing argument behind IPO waves. They find that

the probability of an IPO is positively related to industry valuation. Companies appear to go public not to finance future investments and growth, but to rebalance their accounts after high investment and growth, which is consistent with mispricing. Similarly, IPO volume is higher in times when individual investors are over-optimistic (Lee, Shleifer and Thaler, 1991; Helwege and Liang, 2004). This may explain why IPO volume is concentrated in periods when investors are overly optimistic and willing to overpay (Lowry, 2003). Alternatively, IPO volume may also be related to analyst over-optimism about recent IPOs (Rajan and Servaes, 1997).

2.3. Other explanations behind corporate event cycles

There are a number of additional studies that have identified factors behind corporate event cycles that do not fit straightforwardly into our two main categories. Lambrecht (2004) suggests that economies of scale may drive merger waves in economic booms. The potential synergistic benefit from mergers rises in economic booms and falls in economic downturns if the synergy is an increasing function of product demand. Toxvaerd (2004) argues that merger waves might be caused by competition between bidders for acquiring scarce targets. Morellec and Zhdanov (2004) argue that merger waves are due to the resolution of dynamic option exercise games between bidder and target shareholders.

Studies of IPO waves have examined the correlation between initial IPO stock returns and the future number of IPOs (Lowry and Schwert, 2002), relationships between IPO waves and product market quality where consumers discern product quality from firms going public (Stoughton, Wong and Zechner, 2001), and trade-offs between financial gains from diversification and owners' private benefits of control (Benninga, Helmantel, and Sarig, 2005). According to the last model, firms go public when their cash flows are high, consistent with waves and industry clustering. Finally, the role of underwriters in reducing information externalities may also lead to IPO waves. IPO firms disseminate information by going public, therefore other firms within the same industry enjoy an information externality. Investment bankers solve this free-rider problem by bundling together IPOs for presentation to a common investor pool (Benveniste, Busaba, and Wilhelm, 2002; Benveniste, Ljungqvist, Wilhelm, and Yu, 2003).

Vermaelen (1981, 1984) argues that undervaluation is a driving force behind stock repurchases. Dittmar and Dittmar (2003) argue that share repurchases may be replacing dividends as the firms' preferred method for disgorging cash to investors and repurchase activity mirrors stock issuance activity, casting doubt on the undervaluation explanation of repurchases.

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 corporate transactions, debt and equity issues, and stock repurchases. For corporate transactions, the targets must also be U.S. firms. We include only issues taking place in the U.S. markets. We examine both the volume of transactions and their number. Since all our categories are mutually exclusive, we cross-check the data to ensure that no deal is classified in more than one category. While we analyze the entire universe of deals (including both public and private firms), we also report separately totals for publicly listed firms.

Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand-alone firms, acquisitions of divested assets (defined as 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. In addition, we record the method of payment in each transaction, classifying deals into four categories - 100% cash deals, 100% stock deals, deals where the consideration contains some cash (any percentage) and deals where the consideration contains some stock (any percentage).

There are a number of points that need to be highlighted concerning the SDC data that we use. In general, although the SDC provides indicators of the different variables of interest (such as the percentage of cash or stock in the consideration), we find that these indicators are often wrong or incomplete. Therefore, we also read the synopses of all the transactions in the sample and we make the necessary adjustments to the data based on the information provided in the

synopsis. There are more errors and omissions during the earlier part of our sample period. More specifically, we make the following adjustments:

- (i) The indicators for the proportion of cash and stock in the consideration provided by the SDC are often wrong or incomplete when compared with information provided in the synopsis of the deal and with the verbal descriptive indicator of the type of consideration offered. We encounter the following cases, which are more common during the earlier part of our sample. First, there are numerous instances where the SDC indicator reports one form of consideration, when in fact the description in the synopsis suggests another. Given that the synopsis often provides more detailed information and amounts, we regard the information in the synopsis as more accurate. Second, when there are more than one forms of consideration for the same deal, the indicator may only record one of them.² Third, in some cases the bidder offers the choice of cash or stock to the target's shareholders, when the SDC records only one of the two. Fourth, no value or percentages for cash and stock may be recorded when in fact the synopsis provides the information and the exact amounts. Finally, the SDC does not record the proportion of cash or stock in the consideration when the value of the transaction is not specified, even though the synopsis may state clearly that the consideration consisted entirely of cash or stock.
- (ii) The classification of transactions into divestitures (acquisitions of divested assets), acquisitions of stakes and acquisitions of remaining interests is often incomplete. Therefore, there are more deals in these categories than those classified as such by the SDC. The problem is more significant with divestitures. Although there is a divestiture indicator, it fails to identify a very large number of deals where the target's public status is designated as subsidiary, which should be classified as divestitures. In addition, in a few cases the SDC fails to classify the deals correctly. Based on the synopsis, we make the necessary changes.
- (iii) The indicator for bankrupt deals in the SDC fails to identify numerous such transactions, especially during the earlier part of our sample. For example, a large number of failed savings and loan thrifts during the 1980s are not designated as such,

² For example, the synopsis may state that “.the consideration consisted of \$10 million in cash, common stock and preferred stock”, and the transaction may be reported as 100% cash (\$10 millions) by SDC.

although the synopsis may clearly state that they are bankrupt. We eliminate from the sample additional deals by bankrupt firms based on the information provided in the synopsis.

- (iv) We are interested in completed deals, therefore we eliminate from the sample withdrawn, rumored, intended, and pending deals. One potential problem is that there is a very large number of “pending” deals, especially during the early part of the sample period, that SDC appears to fail to follow through. Whenever the synopsis makes definitive statements that indicate completion of the “pending” deals, we classify them as completed.³
- (v) The value of the transaction may be missing from the SDC indicator variable but may be available in the synopsis.

Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Our preferred stock issues sample includes all public, private placement and rule 144A issues of convertible and non-convertible preferred stock. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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 final sample consists of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004.

Our initial analysis relies on aggregate correlations between numbers of corporate events. However we also identify and analyze periods of waves separately. We define waves for each

³ For example, if the synopsis states that “ABC company *acquired* company XYZ”, we classify this deal as completed, even if the SDC classifies it as pending. On the other hand, if the synopsis states that “ABC was planning to acquire XYZ” we accept SDC’s classification of the deal as pending and we eliminate it from our sample.

corporate event using an approach that is similar (but not identical) to Harford (2005). Each quarter, we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave (we have examined alternative cut-offs for identifying a wave, namely mean plus one or two standard deviations for our series of rolling two-year periods, and the two-year period representing the peak of the wave, and we obtain qualitatively similar results). Unlike Harford (2005), we do not constrain our waves to last for two years only. If there are overlapping two-year periods with activity higher than our cutoff percentile, we extend the duration of the wave to two years following the last quarter with activity above our threshold. Consequently, while eight quarters represent the minimum duration of a wave, we can have waves as long as 25-30 quarters in some industries.

In addition, we collect macroeconomic, stock return, and accounting data for the universe of U.S. publicly listed firms from International Financial Statistics (IFS), CRSP, COMPUSTAT, and DATASTREAM. More specifically, our variables of interest consist of quarterly observations for CRSP's value-weighted NYSE/AMEX/NASDAQ stock index and 1-year buy-and-hold returns, the difference between the BBA corporate bond yield and the 3-year government bond yield (as a proxy for financial constraints and liquidity), the total number of publicly listed firms (since our analysis is conducted on numbers series), the market-wide market-to-book ratio, and market-wide aggregate capital expenditures.

4. Corporate event waves

4.1. Univariate results

Table 2 shows annual levels of the main corporate events in our sample during the period 1980-2004. During this 25-year period, there are a total of 110,580 M&A transactions (which consist of 56,489 mergers or acquisitions, 36,071 divestitures or partial-firm acquisitions, 11,346 acquisitions of non-controlling stakes, 3,989 LBOs, 1,468 tender offers, and 1,217 acquisitions of remaining interests), a total of 106,315 debt issues (which consist of 100,227 non-convertible

debt issues, 3,029 convertible debt issues, and 3,059 issues of medium-term notes), a total of 5,885 preferred stock issues, a total of 23,389 common stock issues (of which 10,077 are SEOs and 8,985 are IPOs), and a total of 17,342 stock repurchases. With respect to the M&A transactions, there are 31,194 deals where the consideration was entirely paid in cash, and 10,743 deals where the consideration was entirely paid in acquirer common stock. We note that these totals are based on the SDC data that we have corrected for errors in the way the method of payment is reported.

We can make four main observations from the table. First, most types of corporate events appear to have two cycles with peaks in the late 1980s and the late 1990s (with the exception of debt issues which appear to peak in the early 2000s), and two troughs coinciding with the downturns in economic activity during 1990-1991 and 2001-2002.

Second, for all types of events, the second cycle consists of substantially more transactions than the first cycle. In fact, for most events, there are more transactions even in the trough of 2001-2002 than there were at the peak of the late 1980s. Figures 1a and 1b plot the series of values of announced transactions announced over the entire 25-year period from 1980-2004 and 1980-1990 respectively. They graphically illustrate the contrast between these two periods. From Figure 1a, it appears that there is only one major wave in the 1990s since the size and number of transactions completely drowns out the pattern in the 1980s. To bring out the pattern in waves in the 1980s, Figure 1b plots the waves separately for the 1980s.

Third, it is interesting to compare the number and value of pure stock issues (where stock is issued in exchange for cash) and stock-financed acquisitions (where stock is issued in exchange for assets with uncertain value). The two series appear of the same order of magnitude, with the value of pure stock issues exceeding the value of stock-financed acquisitions up to 1994. Thereafter, the value of stock-financed acquisitions is considerably larger than other stock issues.

Finally, it is particularly interesting to compare the series of stock repurchases with the remaining series in the table. During the first part of the period, the number of repurchases peaks in 1987 (when there were 894 stock repurchases) and in 1990 (when there were 1,006). Both these peaks coincide with declines in the general level of stock prices (and low levels of M&A transactions and stock issuance activity), suggesting that companies may be buying back their stock because it is undervalued. However, in the second part of the period, stock repurchases appear highly positively correlated with the remaining series in the table, and moreover, appear

to peak in 1998 (when there were 1,903 repurchases), when general stock price levels were high, and M&A activity and stock issuance were also at their peak. In contrast, there were less than 500 repurchases annually at the market downturn of 2001 and 2002. This evidence suggests that either repurchases are used by firms differently in the 1990s compared to the 1980s or that managers may be irrationally buying back their stock at the market's peak, believing that the stock is undervalued (or trying to "fool" investors into believing that their stock is undervalued).

Table 3 reports correlation coefficients between the quarterly value and the quarterly number of transactions. Panel A reports the correlations for different types of M&A activity, and Panel B reports correlations for different types of financing activities. As we observe, there are highly positive and statistically significant correlations between the aggregate value and the total number of transactions for all series. Similarly, we also compute correlations in the aggregate number and value series separately between different sub-types of corporate events (merger, tender offers, acquisitions of non-controlling stakes, acquisitions of remaining interest) with each other, separately for M&A transactions and for financing transactions (not reported in tables). Again, we observe high and statistically significant correlations across different types of events. The correlations are not affected by including all deals or deals by publicly listed firms. In fact, the correlations in the series between all deals and deals by publicly listed firms is almost one.

To summarize these correlation results, our results should not be affected whether we use numbers or volumes of transactions in our analysis or whether we use public firms or all private and public firms. Also using aggregate values in the analysis (as opposed to finer sub-classifications, such as medium-term notes in place of all debt issues) should not affect our results either. To economize on space therefore, in the remainder of this analysis, we focus on the numbers of transactions undertaken by all firms, whether public or private.

Table 4 reports our main univariate results. We focus on the corporate events most closely related to our hypotheses (stock-, cash-, and debt-financed M&A, debt issues, common stock issues, IPOs, SEOs, and stock repurchases) and we report correlations of activity across different types of corporate events. Panel A reports correlations of aggregate activity and Panel B reports correlations between waves of activity. To compute correlations between the waves in Panel B, we use an indicator variable that takes on the value 1 in quarters defined to be part of a wave and zero otherwise. This analysis places less significance on the magnitude of transactions and focuses on determining whether there is any overlap between waves.

When we examine total activity in Panel A, all series appear significantly positively correlated. Waves seem to occur together. There is only one exception - stock repurchases do not seem to be significantly correlated with stock issues (all, IPOs and SEOs). However, when we examine the correlations between waves of activity in Panel B, stock repurchases waves are significantly correlated with stock issuance waves, confirming our inferences from Table 2. Overall, we observe statistically significant positive correlations in waves of activity between cash- and stock-financed M&A transactions (correlation 0.70), cash-financed M&A and common stock issuance (0.42), stock-financed M&A, stock issuance and stock repurchases.

Figures 2a and 2b show graphically the overlap in wave patterns across different types of events for the time periods 1980-1990 and 1991-2004 separately. Figure 2a shows that the SEO wave (1981Q4 through 1984Q3) preceded the IPO wave (1985Q3 through 1987Q4) in the 1980s. Note there are no waves for the other types of transactions in the sample for a simple reason. Recall that our classification scheme classifies a wave as any period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods from 1980-2004. The activity in the latter half of the 1990s completely drowns any waves in the first part of the sample according to our definition.

Figure 2b shows a considerable overlap between the waves in all type of events during the 1990s. Again, the SEO and IPO wave started first (1995Q1 and 1994Q4 respectively), followed by waves in cash-financed M&A (1995Q2), stock repurchases (1995Q4), stock-financed M&A (1996Q2), and debt issues (1997Q1). The SEO and IPO waves were also the first to end, lasting through 1998Q1, whereas the stock-financed acquisition wave was the last one to end, lasting until the end of 2000Q4. Interestingly, there is considerable overlap between stock repurchases and SEO, IPO or stock-financed M&A activity. This casts doubt on the idea that firms buy back their stock at periods when it is undervalued.

4.2. Multivariate analysis

4.2.1. Vector autoregressive (VAR) models of total activity

Our univariate correlation analysis suggests that waves of different types all happen together. The figures suggest there is a pattern in waves with issue waves occurring before M&A

waves followed by repurchase waves and debt issue waves. We next use third-order vector autoregressive (VAR) models to check whether these patterns exist in the complete sample from 1980-2004. As mentioned above, the results are reported for the number of transactions. These models allow for serial correlation in the corporate event variables, and also allow tests of the incremental predictive ability of lagged volume in one type of activity to predict the volume of the other (Granger *F*-tests). For each pair of corporate events, we report two models. The first model includes only endogenous variables (lagged volume of different types of corporate events), while the second includes additional exogenous macroeconomic variables. Significance levels are based on White (1980) heteroskedasticity-consistent standard errors.

These results are reported in Table 5, Panels A through F. Panel A reports results for SEOs and IPOs. Consistent with the graphs, SEOs and IPOs happen together - lagged values of both variables have incremental predictive ability for the other, in line with Figure 2. In addition, the prior one-year market return is also significantly related to the number of SEOs and IPOs in any quarter suggesting that the market affects the probability that the firm issues stock, either to take advantage of misvaluation or to take advantage of potential growth opportunities.

Panel B reports results for the relationship between SEO and stock-financed M&A waves. Consistent with the graphs, lagged SEO volume has significant incremental predictive ability for stock-financed M&A, though the relationship becomes marginally insignificant after controlling for the macroeconomic environment variables. Granger *F*-tests show that lagged SEO volume significantly predicts stock-financed M&A volume. Consequently, high past SEO volume seems to be associated with higher future stock-financed M&A volume. Similar inferences can be made for the relationship between IPO volume and stock-financed M&A activity in Panel C, although again lagged IPO activity has little incremental explanatory power for stock-financed M&A.

Panel D reports results for acquisitions. For stock-financed acquisitions, the number of stock-financed acquisitions in the prior quarter is highly significant in predicting the number of activity in any quarter. However, the lagged volume of either stock- or cash-financed acquisitions has little incremental predictive ability for the volume of the other. Prior one-year stock returns are positively related to both stock- and cash-financed M&A activity.

Panel E examines the relationship between total stock issuance activity and stock repurchases. In general, lagged values of both variables have incremental predictive ability, in

line with Figure 2. What is surprising, however, is that neither prior one-year stock returns nor the market-to-book ratio has a statistically significant relationship with stock repurchase activity. This finding casts doubt on the notion that stock repurchases are undertaken when firms are undervalued.

Panel F examines the relationship between stock-financed M&A and stock repurchase activity. One quarter lagged stock-financed M&A activity has predictive power for stock repurchase activity, before controlling for macroeconomic factors, again casting doubt on the notion that stock repurchases are a response to undervaluation.

4.2.1. Logit models of the likelihood of waves

Which is the most likely explanation for the wave patterns that we observe? In this section, we report logit models of the likelihood of waves in corporate event activity. The explanatory variables are value-weighted NYSE/AMEX/NASDAQ 1-year buy-and-hold returns, the difference between the BBA corporate bond yield and the 3-year government bond yield (as a proxy for financial constraints and liquidity), the market-wide market-to-book ratio, and market-wide aggregate capital expenditures. The inclusion of capital expenditures is important because it helps shed light on whether the waves are the result of firms raising capital in order to pursue capital expenditures or whether the waves are more likely to be driven by misvaluation. We include two capital expenditure variables. Capital expenditures in the year preceding the corporate event is the aggregate total of four preceding quarters of market-wide capital expenditures. Capital expenditures in the year following the event is the aggregate total of four following quarters of market-wide capital expenditures. Therefore, we examine whether the wave is a response to low prior capital expenditures, and whether aggregate capital expenditure increases following the wave. Such a finding would indicate that the wave is the result of firms' demand of capital for investment, possibly as a response to an economic shock.

We are interested in wave quarters of one type of event preceding the beginning of a wave of another event, overlapping with quarters of another event or following the end of the wave of another event. For example, whenever one quarter of event A is part of a wave and the same quarter of event B is also a part of a wave, then this quarter is counted as part of an overlapping wave between events A and B. For all quarters when there are non-overlapping

waves between A and B, we count how many non-overlapping quarters of an A wave precede the beginning of a B wave, and classify these quarters as quarters when an A wave precedes the beginning of a B wave (for non-overlapping quarters following a wave we count how many non-overlapping quarters of an A wave follow the end of a B wave, and classify these quarters as quarters when an A wave follows the end of a B wave). Whenever there is a wave of A preceding a wave of B but there is no overlapping quarter between the two, we count how many quarters of A precede the beginning of B for up to 2 years (eight quarters) before the beginning of B. We classify these quarters as quarters when A precedes the beginning of B. At the same time, we count the same number of quarters as quarters when B follows the end of A. Therefore, our definition of preceding refers to quarters of an A wave *preceding the beginning* of a B wave, and our definition of following refers to quarters of an A wave *following the end* of a B wave.⁴

Subsequently, we estimate logit models of the likelihood that any given quarter is a quarter when a wave of one event precedes the beginning of another, when they are overlapping, and when one event's wave follows the end of the wave of another event. These results are reported in Table 8. Significance levels (*p*-values) in parentheses are based on Huber-White (quasi-maximum likelihood) standard errors and co-variances.

In Table 6, Panel A, columns (1) and (2) show that the likelihood of cash-financed M&A waves appears to be related to the need for capital expenditures during the period they precede stock-financed M&A waves. However, by the time that the stock-financed M&A waves begin, their likelihood does not appear related to the need for capital expenditures. We obtain similar results when we examine the relationship between stock-financed M&A, SEO and IPO waves in columns (3) to (8). Consequently, although the need for capital may be the initial driving force behind cash-financed M&A, SEO and IPO waves (suggesting a neoclassical explanation of waves), towards their later part they appear to be driven by overvaluation.

⁴ To give two examples to clarify our procedure, let us first assume that event A exhibits a wave from 1995Q1 to 1998Q1 and event B from 1994Q1 to 1997Q1. We classify 1994Q1-1994Q4 as quarters when a B wave precedes the beginning of an A wave, 1995Q1-1997Q1 as overlapping quarters, and 1997Q2-1998Q1 as quarters when an A wave follows the end of a B wave. Notice that if the two waves ended on the same quarter, then we would count four quarters when a B wave precedes the beginning of an A wave but no quarters for the A wave following the end of a B wave. Second, if the A wave occurred from 1995Q1 to 1998Q1 and the B wave between 1999Q1 to 2001Q1, then we would classify 1997Q1-1998Q1 as quarters when an A wave precedes the beginning of a B wave and 1999Q1-2000Q1 as quarters when a B wave follows the end of an A wave. To avoid counting distant non-overlapping waves as preceding or following, we use a 2-year cut-off period for identifying whether there is a wave preceding (or following) the beginning (or end) of another one.

Interestingly, overvaluation appears to drive the likelihood of stock repurchase waves in Panel A, columns (9) and (10), and Panel B, columns (1) and (2). The likelihood of stock repurchase waves appears significantly positively related to prior one year stock returns and to the market-to-book ratio. Consequently, stock repurchase waves appear to occur when the market is potentially overvalued (as opposed to undervalued). The remaining columns of Table 6, Panel B, examine the likelihood of debt issuance, IPO and SEO waves. Not surprisingly, the likelihood of stock issuance waves is positively related to higher prior one year stock returns and to the market to book ratio. In analysis not reported in tables, we also examine what determines the likelihood of the beginning of a wave, obtaining qualitatively similar results.

The results on stock repurchase activity are surprising. Figure 3 shows that whereas during the 1980s there is a large number of repurchases only in periods where the stock index shows declines (especially in 1987 and less importantly in 1990), the activity of the 1990s mirrors very closely that of the index. In fact, there is a lot of repurchase activity when the index reaches its peak in 2000Q1. Subsequently, as the index declines considerably, repurchase activity declines as well. If firms buy back their shares when they are undervalued, the 2000s is the period when we would expect to see more repurchases. To explore the possibility that stock repurchase activity mirrors dividends activity (i.e. that stock repurchases replace dividends as the firms' preferred method for disgoring cash to investors), we also run first-order vector autoregressive (VAR) models of annualized dividends and the value of stock repurchases (not reported in tables). We annualize the series because cash dividends show large quarterly variation. We do not find any statistically significant coefficients either for lagged repurchases explaining dividends or vice versa. In fact, while dividends appear to be correlated with repurchases throughout the 1990s, dividends continue to rise during the economic downturn of the early 2000s, while repurchase activity declines.

If firm raise cash through SEOs in order to take advantage of profitable investment opportunities, we would expect to find a positive relation between the volume of stock issuance activity and aggregate capital expenditures. Again, we run first-order vector autoregressive (VAR) models of annualized capital expenditures and the aggregate value of SEOs (not reported in tables). After controlling for macroeconomic factors, we find that lagged capital expenditures are significantly related to SEOs but not vice versa. On the other hand, lagged values of stock-financed M&A volume show no statistically significant relationship to capital expenditure,

whereas lagged capital expenditure is significant in predicting stock-financed M&A activity. It does appear therefore, that although during the early part of the wave, firms issue stock in exchange for cash in order to undertake capital expenditures, during the later part of the wave firms issue stock in exchange for assets after they have undertaken capital expenditures.

To summarize the characteristics of the five types of waves outlined in the introduction and Table 1, in *neoclassical* waves, we should see waves of all types – mergers, new issues, debt issues – occurring together. In *minnow* waves, IPO waves will occur before merger waves but there are no clear predictions for stock repurchases. *Pecking order* waves should show debt-issues and cash- and debt-financed acquisitions waves occurring before other types of waves. In *stock-market driven* waves, there will be correlations between waves that involve stock – for example, SEOs, IPOs and stock-financed acquisition waves should all happen at similar points in time, but stock repurchase waves should not happen at the same time as stock-financed waves. Finally, in *cascade* waves, stock issue waves start first and they will be followed by merger waves which in turn will be followed by repurchase waves and debt issue waves.

Taken together, our results for the waves in the 1980-2004 period, are not characteristic of *pecking order* or *stock-market driven* waves. In addition, the large number of stock-financed acquisitions relative to the number of initial public offerings casts some doubt on the hypothesis that this was a *minnow* wave. Although the *neoclassical* explanation cannot be discarded for the beginning of the wave, overall the characteristics of the wave are most consistent with *cascade* waves, especially the relationship between stock issuance and stock repurchase waves, and the fact that stock-financed M&A waves continue well after all other stock issuing waves have ended. In fact, it is possible that whereas the *neoclassical* explanation may have played a significant role in starting the waves of the 1990s, the waves may have led to over-optimism and may have evolved into cascades towards the second part of the decade.

4.3. Industry analysis

Do the aggregate patterns that we have documented in the previous sub-sections apply within each industry or do different industries follow different patterns? For example, one might argue that a merger wave may be happening in industry A, whereas the IPO wave may be

happening in industry B. At the aggregate level, this would produce a pattern between the two waves, while such a pattern may not actually exist at the industry level.

We classify the universe of firms in our sample into 62 industries, following the SDC classification. This classification mostly corresponds to the two-digit SIC code classification, with the exception of a few two-digit SIC codes which are combined into one industry and some others which are divided into two or more industries. The correspondence between our classification and COMPUSTAT's classification based on SIC codes, appears in Table 7. The table also reports, separately for every corporate event, the proportion of total activity attributed to firms in each industry, for the 10 industries representing more than 5% of activity over the entire 25-year period in *at least one* of the corporate events (consequently, industries that do not appear on the table represent less than 5% of activity in *all* types of events). Again, we measure activity by the number of deals. Our classification of M&A activity is based on the industry of the acquirer, to make it more directly comparable with financing activity. Finally, we also report the number of waves within each industry for every type of event and the total duration of the waves in quarters. Within each industry, the wave periods are identified using the same procedure that we employed for the aggregate waves.

Three of the 10 industries in Table 7 are related to financial services, namely commercial banks and bank holding companies (SIC codes 6020-6029, 6712; representing 19% of total stock-financed M&A activity, 11% of stock repurchases and 26% of debt issues), other savings institutions (SIC codes 6030-6039; representing 9% of stock repurchase activity), and investment and commodity firms (SIC codes 6190-6199, 62, 6720-6799; representing 33% of total cash-financed M&A activity, 6% of stock-financed M&A activity, and 19% of debt issues). The latter industry includes investment banks, private equity firms, investment holding companies, and most of the LBO acquirers, which may explain the large volume of cash-financed activity. Not surprisingly, the business services and software industries also appear in the list (SIC codes 7320-7399, 87), representing between them 20% of stock-financed M&A activity, 10% of SEOs, 20% of IPOs, and 9% of stock repurchase activity. Finally, the remaining industries in the table are oil and gas, drugs, electronic and electrical equipment, measuring and photo equipment, and finally, electric, gas and water distribution.

In line with the evidence on aggregate activity reported in Figures 2a and 2b, the majority of industries exhibit one M&A wave (overall lasting from 14 to 25 quarters), but two or more

SEO and IPO waves (overall lasting from 16 to 39 quarters). Therefore, these industry patterns appear to mirror the aggregate activity patterns.

We examine in more detail the industry patterns for the 10 industries with the highest activity and compare them with the aggregate activity patterns in Table 10. The table reports the number of wave quarters of one type of event preceding the beginning of a wave of another event, overlapping with quarters of another event or following the end of the wave of another event. We count how many preceding, overlapping and following quarters have been identified over the entire 25 year period and report them in the table. If there are some quarters when a wave in A precedes a wave in B and some when a wave in B precedes a wave in A during the entire sample period, we report the difference between the two. Whenever the direction of the relationship goes in the opposite direction than the one stated in the table, we report the number of quarters as negative figures in parentheses.

The aggregate pattern (from Figures 2a and 2b) is reported in column (1) and industry patterns in columns (2) to (11). For aggregate activity in column (1), there is an overlap of 14 quarters between cash- and stock-financed M&A waves, with the cash-financed M&A wave preceding the beginning of the stock-financed M&A wave by 4 quarters, and the stock-financed wave following the end of the cash-financed wave by 5 quarters. All 10 industries exhibit considerable overlap between the two waves, with the number of overlapping quarters ranging from 4 in the drugs industry to 16 in the electronic and electrical equipment industry. There is more mixed evidence with respect to which wave precedes or follows the other. In 6 out of 10 industries, the cash-financed wave precedes the beginning of the stock-financed wave (in the remaining 4 industries, it is the stock-financed wave that precedes the beginning of the cash-financed wave), and in 5 out of 10 industries, the stock-financed wave follows the end of the cash-financed wave. On balance, we can conclude only that there is a significant overlap between cash and stock-financed M&A waves.

Of particular significance is the relationship between stock-financed M&A, SEOs, IPOs, and stock repurchases. Not surprisingly, there is considerable overlap between stock-financed M&A, SEO, and IPO activity (8 quarters in the aggregate activity figures in column (1), and in most industries). However, the waves do not overlap completely. SEO waves precede the beginning of stock-financed M&A waves by 5 quarters when examining aggregate activity in column (1), and in six out of the 10 industries. More importantly, the stock-financed M&A wave

continues for another 11 quarters after the SEO wave has ended (in column 1) and the pattern is the same in eight out of the 10 industries. Similar inferences can be made when examining the relationship between stock-financed M&A and IPO waves. Overall, it appears that at the beginning of a wave firms tend to issue stock in exchange for cash, whereas at the end of the wave they tend to issue potentially overvalued stock in exchange for potentially overvalued assets.

What is even more striking is the considerable overlap between stock issuing and stock repurchase waves. Stock-financed M&A waves overlap with stock repurchase waves for 17 quarters (looking at aggregate activity) and in *all* 10 industries (by between 4 and 17 quarters). This is an overlapping period spanning between one and four years. It is also the period when any potential stock overvaluation would be at its highest. Similarly, there is an 11 quarter overlap between stock issuance waves (which includes SEOs, IPOs, and all other stock issues but excludes stock-financed M&A) and stock repurchase waves in column (1), and in 7 out of 10 industries. The remaining rows of Table 10 show some overlap between stock and debt issuing waves, and considerable overlap between SEO and IPO waves.

Taken together, the industry by industry results reported in Table 10 are in line with our main hypothesis, namely that is the cascade explanation of waves that mostly fits our data. We observe that industry patterns are very similar to the aggregate patterns of activity.

5. Conclusions

Corporate events of all types (mergers, divestitures, initial public offerings (IPOs), seasoned equity offerings (SEOs), debt offerings, and stock repurchases) happen in waves. Despite much empirical and theoretical research however, the literature still lacks a consensus on why waves occur. Brealey, Myers, and Allen (2006) for example, list the occurrence of merger waves as one of their ten currently unsolved problems in finance.

In this paper, we examine the relationship between five different types of corporate event waves (mergers, IPOs, SEOs, stock repurchases, and debt issues) using a comprehensive dataset of more than 264,000 corporate transactions over the 25-year period 1980-2004. Our results show considerable overlap between all types of waves, especially during the 1990s. Stock issuing waves are followed by cash-financed M&A, stock repurchases, stock-financed M&A,

and finally debt waves. Stock-financed M&A waves continue well after SEO and IPO waves have ended. There is also considerable overlap between stock-financed M&A and stock repurchase waves, suggesting that most stock repurchases occur when the market is probably overvalued.

Taken together, we conclude that the characteristics of the waves in the 1980-1990 period are most consistent with the characteristics of *cascade* waves. Although we cannot eliminate the possibility that the *neoclassical* explanation may have played a significant role in starting the waves of the 1990s (most of the industries that we identify as exhibiting the highest activity have experienced technological shocks or deregulation), our evidence suggests that the waves may have led to over-optimism and may have evolved into cascades towards the second part of the decade.

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Table 1
Types of corporate event waves

Panel A. Perfect information

		Market	
		Rational	Irrational
Managers	Rational	1. Neoclassical wave Technological breakthrough/Economic shock/Deregulation causes wave Implication: All types of waves will occur at the same time. 2. Minnow wave Smaller firms are better able to take advantage of technological shocks than larger more bureaucratic firms Implication: Mergers will occur after new issues waves; does not explain repurchases	N/A
	Irrational	N/A	N/A

Panel B. Asymmetric information

		Market	
		Rational	Irrational
Managers	Rational	3. Pecking order wave Firms choose to finance deals with internal funds, then debt, and finally stock Implication: Cash financed waves occur first, followed by debt financed deals, and finally stock financed deals	4. Stock-market driven wave Markets temporarily overvalue firms due to exuberance. Managers take advantage of misvaluation. Implication: Waves involving stock happen together
	Irrational	5. Hubris wave Irrational managers overestimate their ability to create value. Does not imply that waves will occur.	6. Cascade wave Growth opportunities occur. Rational managers issue stock to take advantage of opportunity. Feedback leads managers and markets to overestimate opportunity. Over-optimistic managers believe they are undervalued. Implication: Stock issue waves occur first, followed by merger waves, followed by repurchases.

Table 2

Annual series of M&A and financing transactions

Descriptive statistics for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Our preferred stock issues sample includes all public, private placement and rule 144A issues of convertible and non-convertible preferred stock. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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.

Year	All M&A transactions		All fully cash-based M&A transactions		All fully stock-based M&A transactions		All debt-based M&A transactions (LBOs)		All debt issues		All preferred stock issues		All common stock issues		Initial public offerings (IPOs)		Seasoned equity offerings (SEOs)		Stock repurchases and self-tender offers	
	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)	Number	Value (\$ bil)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1980	79	14	8	3	28	6	4	2	494	39	73	3	522	13	143	1	379	11	3	0
1981	874	69	16	16	190	8	12	1	1,145	53	102	3	817	15	339	3	418	12	107	2
1982	1560	52	44	1	234	7	21	2	1,402	70	152	6	610	16	119	1	436	15	111	2
1983	2673	72	77	1	361	11	60	9	1,535	74	247	10	1,552	38	667	12	798	25	195	9
1984	2856	124	154	12	320	8	104	10	1,546	102	206	6	657	10	338	3	240	6	517	37
1985	1643	165	606	81	87	15	152	22	2,318	163	248	11	909	25	322	6	378	15	220	33
1986	2421	155	1,024	96	152	14	227	21	3,205	285	306	17	1,361	44	684	17	476	20	261	32
1987	2360	131	916	69	152	12	199	27	3,069	269	283	15	946	32	495	13	283	12	894	57
1988	2689	190	1,155	128	114	9	250	37	3,312	330	213	12	558	19	205	4	126	6	369	47
1989	3386	178	1,264	81	236	27	253	18	2,926	363	179	11	637	30	195	5	208	8	677	70
1990	3366	96	1,076	49	212	22	158	7	2,522	264	124	7	497	22	167	4	176	9	1,006	40
1991	3366	85	991	32	306	25	182	5	3,469	356	170	18	910	48	355	15	442	30	458	21
1992	3919	103	1,192	39	441	23	201	8	3,887	454	255	25	1,075	56	475	20	464	30	618	38
1993	4645	181	1,475	53	556	45	166	8	5,219	585	300	25	1,370	71	605	28	642	39	618	40
1994	5676	228	1,863	105	667	53	163	6	3,781	466	170	17	1,045	48	507	16	377	23	1,036	75
1995	6829	329	2,204	113	724	121	208	12	4,052	580	149	15	1,163	76	520	24	517	42	1,109	97
1996	7843	469	2,600	136	838	129	186	15	4,667	661	340	49	1,491	101	766	38	612	50	1,455	173
1997	8575	686	2,543	170	973	220	190	16	7,409	968	454	53	1,190	98	514	27	527	51	1,292	179
1998	9321	1,220	2,568	202	949	659	160	15	8,939	1,243	322	48	841	113	314	29	372	47	1,903	229
1999	8100	1,103	2,110	219	876	413	177	27	8,634	1,393	229	33	1,027	161	478	53	397	76	1,475	155
2000	7512	1,171	1,784	191	941	571	261	32	8,095	1,285	346	30	917	194	354	49	362	90	814	167
2001	5174	542	1,273	121	537	108	132	10	7,429	1,454	396	49	748	131	83	30	311	58	665	155
2002	4824	320	1,296	119	348	91	143	22	6,000	1,194	230	36	736	97	79	22	313	52	485	120
2003	5244	416	1,472	149	284	110	121	19	5,879	1,388	224	24	792	79	70	10	378	55	490	103
2004	5645	443	1,483	228	217	108	259	43	5,381	1,105	167	23	1,018	111	191	32	445	68	564	232
Total	110,580		31,194		10,743		3,989		106,315		5,885		23,389		8,985		10,077		17,342	

Table 3
Correlations between quarterly value and quarterly number of transactions

Correlations between quarterly value and quarterly number of transactions for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. Panel A reports results for different types of M&A transactions. Panel B reports results for financing issues. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Our preferred stock issues sample includes all public, private placement and rule 144A issues of convertible and non-convertible preferred stock. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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. Significance levels (*p*-values) are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level respectively.

Panel A. M&A transactions

	All acquirers					Public acquirers				
	All methods of payment	All-cash deals	All- or partial cash deals	All-stock deals	All- or partial stock deals	All methods of payment	All-cash deals	All- or partial cash deals	All-stock deals	All- or partial stock deals
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All M&A transactions	0.78 (0.000)***	0.77 (0.000)***	0.76 (0.000)***	0.67 (0.000)***	0.74 (0.000)***	0.78 (0.000)***	0.79 (0.000)***	0.77 (0.000)***	0.67 (0.000)***	0.74 (0.000)***
Mergers	0.82 (0.000)***	0.54 (0.000)***	0.76 (0.000)***	0.68 (0.000)***	0.75 (0.000)***	0.80 (0.000)***	0.45 (0.000)***	0.71 (0.000)***	0.68 (0.000)***	0.75 (0.000)***
Acquisitions of divested assets	0.73 (0.000)***	0.87 (0.000)***	0.85 (0.000)***	0.51 (0.000)***	0.50 (0.000)***	0.66 (0.000)***	0.82 (0.000)***	0.81 (0.000)***	0.51 (0.000)***	0.47 (0.000)***
All LBOs	0.60 (0.000)***	0.65 (0.000)***	0.67 (0.000)***	0.56 (0.000)***	0.57 (0.000)***	0.61 (0.000)***	0.64 (0.000)***	0.73 (0.000)***	0.67 (0.000)***	0.60 (0.000)***
Tender offers	0.51 (0.000)***	0.57 (0.000)***	0.53 (0.000)***	0.40 (0.000)***	0.36 (0.000)***	0.50 (0.000)***	0.54 (0.000)***	0.50 (0.000)***	0.43 (0.000)***	0.38 (0.000)***
Acquisitions of non-controlling stakes	0.47 (0.000)***	0.40 (0.000)***	0.37 (0.000)***	0.49 (0.000)***	0.78 (0.000)***	0.59 (0.000)***	0.55 (0.000)***	0.55 (0.000)***	0.38 (0.000)***	0.72 (0.000)***
Acquisitions of remaining interests	0.41 (0.000)***	0.65 (0.000)***	0.64 (0.000)***	0.24 (0.017)**	0.28 (0.004)***	0.40 (0.000)***	0.58 (0.000)***	0.61 (0.000)***	0.24 (0.017)**	0.29 (0.004)***

Panel B. Financing issues (debt, preferred stock, and common stock issues, spin-offs and share repurchases)

	All debt issuers	Publicly listed debt issuers		All preferred stock issuers (3)		All common stock issuers (4)
	(1)	(2)				
All debt issues	0.93 (0.000)***	0.92 (0.000)***	All preferred stock	0.79 (0.000)***	All common stock	0.39 (0.000)***
Medium-term notes	0.34 (0.001)***	0.31 (0.002)***	All convertible preferred stock	0.72 (0.000)***	IPOs	0.39 (0.000)***
All convertible debt issues	0.63 (0.000)***	0.65 (0.000)***	All non-convertible preferred stock	0.83 (0.000)***	SEOs	0.41 (0.000)***
All non-convertible debt issues	0.91 (0.000)***	0.90 (0.000)***			Spin-offs	0.57 (0.000)***
					Stock repurchases and self-tender offers	0.63 (0.000)***

Table 4

Correlations between stock-, cash-, and debt-based transactions (based on number of transactions)

Correlations between quarterly numbers across different types of transactions for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. Panel A reports results of total activity correlations. Panel B reports results for correlations between waves. We define waves for each corporate event using the following approach. Each quarter we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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. Significance levels (*p*-values) are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level respectively.

Panel A. Correlation of total activity

	All fully cash-based M&A transactions	All fully stock-based M&A transactions	All debt-based M&A transactions (LBOs)	All debt issues	All common stock issues	IPOs	SEOs	Stock repurchases and self-tender offers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All M&A transactions	0.93 (0.000)***	0.90 (0.000)***	0.46 (0.000)***	0.85 (0.000)***	0.31 (0.002)***	0.24 (0.015)**	0.17 (0.097)*	0.72 (0.000)***
All fully cash-based M&A transactions		0.79 (0.000)***	0.59 (0.000)***	0.77 (0.000)***	0.30 (0.002)***	0.28 (0.005)***	0.10 (0.332)	0.71 (0.000)***
All fully stock-based M&A transactions			0.25 (0.012)**	0.73 (0.000)***	0.40 (0.000)***	0.39 (0.000)***	0.30 (0.003)***	0.63 (0.000)***
All debt-based M&A transactions (LBOs)				0.42 (0.000)***	0.19 (0.058)*	0.22 (0.029)**	-0.14 (0.158)	0.30 (0.002)***
All debt issues					0.23 (0.023)**	0.04 (0.675)	0.11 (0.272)	0.52 (0.000)***
All common stock issues						0.85 (0.000)***	0.84 (0.000)***	0.03 (0.765)
IPOs							0.57 (0.000)***	0.13 (0.205)
SEOs								-0.12 (0.221)

Panel B. Correlation between waves of corporate events

	All fully stock-based M&A transactions	All debt-based M&A transactions (LBOs)	All debt issues	All common stock issues	IPOs	SEOs	Stock repurchases and self-tender offers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All M&A transactions			0.78738 (0.000)***	0.2147 (0.032)**			0.93444 (0.000)***
All fully cash-based M&A transactions	0.70198 (0.000)***	-0.14139 (0.161)	0.55019 (0.000)***	0.4176 (0.000)***	0.46806 (0.000)***	0.45083 (0.000)***	0.83468 (0.000)***
All fully stock-based M&A transactions		0.14563 (0.148)	0.86658 (0.000)***	0.17141 (0.088)*	0.20532 (0.040)**	0.19132 (0.057)*	0.87005 (0.000)***
All debt issues		0.24435 (0.014)**		0.04202 (0.678)	0.05735 (0.571)	0.04611 (0.649)	0.73086 (0.000)***
All common stock							0.28164 (0.005)***
IPOs							0.32469 (0.001)***
SEOs							0.30906 (0.002)***

Table 5
Do event waves predict other event waves?

We report results of third-order vector autoregressive (VAR) models, which allow for serial correlation in the corporate event variables, and also allow tests of the incremental predictive ability of lagged volume in one type of activity to predict the volume of the other (Granger *F*-tests). For each pair of corporate events, we report two models. One including only the endogenous variables (lagged quarterly number of transactions for different types of corporate events), and another including additional exogenous macroeconomic variables. Our sample consists of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. Panel A reports regressions of SEOs and IPOs. Panel B reports regressions of stock-financed M&A transactions and SEOs. Panel C reports regressions of stock-financed M&A transactions and IPOs. Panel D reports regressions of stock-and cash-financed M&A transactions. Panel E reports regressions of stock issuing activity (SEOs, IPOs, and other forms of issuing stock but excluding stock-financed M&A) and stock repurchases. Panel F reports regressions of stock-financed M&A transactions and stock repurchases. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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. We obtain macroeconomic, stock return, and accounting data for the universe of U.S. publicly listed firms from International Financial Statistics (IFS), CRSP, COMPUSTAT, and DATASTREAM. More specifically, our variables of interest consist of quarterly observations for CRSP's value-weighted NYSE/AMEX/NASDAQ stock index and 1-year buy-and-hold returns, the difference between the BBA corporate bond yield and the 3-year government bond yield (as a proxy for financial constraints and liquidity), the total number of publicly listed firms (since our analysis is conducted on numbers series), and the market-wide market-to-book ratio. Significance levels (*p*-values) in parentheses are based on White (1980) heteroskedasticity-consistent standard errors. ***, **, * denote statistical significance at the 1%, 5%, and 10% level respectively.

Panel A. SEOs and IPOs

	(1)	(2)	(3)	(4)
Dependent variable	SEOs _t	IPOs _t	SEOs _t	IPOs _t
Constant	42.2934 (0.000)***	0.42166 (0.966)	3.1011 (0.920)	-18.1220 (0.516)
Endogenous variables				
SEOs _{t-1}	0.69757 (0.000)***	0.25735 (0.100)*	0.4874 (0.000)***	0.1492 (0.284)
SEOs _{t-2}	0.10068 (0.506)	0.40173 (0.013)**	0.0376 (0.785)	0.4087 (0.007)***
SEOs _{t-3}	-0.066738 (0.590)	-0.40721 (0.012)**	0.1152 (0.334)	-0.2417 (0.136)
IPOs _{t-1}	-0.26577 (0.033)**	0.48769 (0.002)***	-0.3111 (0.012)**	0.3388 (0.041)**
IPOs _{t-2}	0.23026 (0.215)	0.10471 (0.520)	0.2252 (0.175)	0.0624 (0.651)
IPOs _{t-3}	-0.12817 (0.289)	0.12452 (0.259)	-0.1294 (0.236)	0.1076 (0.292)
Exogenous variables				
BBA corporate bond yield over 3-year government bond yield			485.7119 (0.176)	-271.8083 (0.436)
Value-weighted 1-year stock returns			110.5186 (0.000)***	50.8528 (0.023)**
Total number of publicly listed firms			0.0030 (0.473)	-0.0040 (0.373)
Market-to-book			0.8794 (0.937)	26.6669 (0.025)**
Granger <i>F</i> -tests				
Lagged IPOs	(0.107)		(0.050)**	
Lagged SEOs		(0.000)***		(0.001)***
Adjusted R ²	0.38	0.64	0.48	0.70
Number of observations	97	97	97	97

Panel B. Stock-financed M&A transactions and SEOs

	(1)	(2)	(3)	(4)
	All fully stock-financed M&A transactions _t	SEO _{s,t}	All fully stock-financed M&A transactions _t	SEO _{s,t}
Constant	-7.4204 (0.237)	41.7052 (0.000)***	-59.3948 (0.122)	90.0756 (0.059)*
Endogenous variables				
All fully stock-financed M&A transactions _{t-1}	0.49218 (0.000)***	-0.15321 (0.340)	0.3457 (0.004)***	0.0130 (0.937)
All fully stock-financed M&A transactions _{t-2}	0.24798 (0.072)*	0.13519 (0.482)	0.1520 (0.226)	0.1083 (0.607)
All fully stock-financed M&A transactions _{t-3}	0.19264 (0.050)**	0.034834 (0.819)	0.2578 (0.008)***	0.1112 (0.437)
SEO _{s,t-1}	0.15531 (0.007)***	0.58208 (0.000)***	0.1179 (0.126)	0.3019 (0.004)***
SEO _{s,t-2}	0.084354 (0.272)	0.20077 (0.112)	0.1057 (0.176)	0.1246 (0.245)
SEO _{s,t-3}	-0.088051 (0.164)	-0.21185 (0.032)**	-0.0392 (0.521)	-0.0746 (0.468)
Exogenous variables				
BBA corporate bond yield over 3-year government bond yield			-602.9257 (0.005)***	746.9224 (0.013)**
Value-weighted 1-year stock returns			36.4487 (0.027)**	113.1058 (0.000)***
Total number of publicly listed firms			0.0130 (0.127)	-0.0137 (0.157)
Market-to-book			-5.8565 (0.565)	4.6657 (0.702)
Granger <i>F</i> -tests				
Lagged SEOs	(0.025)**		(0.063)*	
Lagged All fully stock-financed M&A transactions		(0.740)		(0.275)
Adjusted R ²	0.89	0.34	0.90	0.46
Number of observations	97	97	97	97

Panel C. Stock-financed M&A transactions and IPOs

	(1)	(2)	(3)	(4)
	All fully stock-financed M&A transactions _t	IPOs _t	All fully stock-financed M&A transactions _t	IPOs _t
Constant	-1.3138 (0.774)	26.8920 (0.000)***	-32.8602 (0.269)	-16.1415 (0.733)
Endogenous variables				
All fully stock-financed M&A transactions _{t-1}	0.46999 (0.000)***	-0.018938 (0.898)	0.3894 (0.003)***	-0.6667 (0.672)
All fully stock-financed M&A transactions _{t-2}	0.29251 (0.042)**	0.19712 (0.286)	0.2079 (0.125)	0.1170 (0.514)
All fully stock-financed M&A transactions _{t-3}	0.16941 (0.137)	-0.18405 (0.280)	0.2288 (0.038)**	-0.0696 (0.631)
IPOs _{t-1}	0.19912 (0.005)***	0.69072 (0.000)***	0.1313 (0.060)*	0.5018 (0.000)***
IPOs _{t-2}	-0.061265 (0.438)	0.17930 (0.183)	-0.0346 (0.633)	0.2211 (0.050)**
IPOs _{t-3}	-0.035744 (0.564)	-0.15664 (0.147)	-0.0290 (0.629)	-0.1004 (0.261)
Exogenous variables				
BBA corporate bond yield over 3-year government bond yield			-412.5544 (0.073)*	69.1176 (0.841)
Value-weighted 1-year stock returns			49.9420 (0.001)***	91.0052 (0.000)***
Total number of publicly listed firms			0.0093 (0.178)	0.0003 (0.974)
Market-to-book			-6.9244 (0.489)	15.7884 (0.283)
Granger <i>F</i> -tests				
Lagged IPOs	(0.037)**		(0.293)	
Lagged All fully stock-financed M&A transactions		(0.657)		(0.885)
Adjusted R ²	0.88	0.55	0.90	0.64
Number of observations	97	97	97	97

Panel A. Stock- and cash-financed M&A transactions

	(1)	(2)	(3)	(4)
	All fully stock-financed M&A transactions _t	All fully cash-financed M&A transactions _t	All fully stock-financed M&A transactions _t	All fully cash-financed M&A transactions _t
Constant	4.5268 (0.307)	17.6881 (0.024)**	-84.0871 (0.132)	-411.1803 (0.000)***
Endogenous variables				
All fully stock-financed M&A transactions _{t-1}	0.61970 (0.000)***	0.020309 (0.932)	0.4906 (0.000)***	-0.0650 (0.761)
All fully stock-financed M&A transactions _{t-2}	0.20840 (0.164)	0.20162 (0.473)	0.1424 (0.337)	-0.0123 (0.965)
All fully stock-financed M&A transactions _{t-3}	0.057173 (0.574)	-0.27942 (0.169)	0.1927 (0.048)**	-0.3379 (0.064)*
All fully cash-financed M&A transactions _{t-1}	-0.031707 (0.597)	0.73264 (0.000)***	-0.0642 (0.284)	0.5637 (0.000)***
All fully cash-financed M&A transactions _{t-2}	0.022311 (0.768)	0.18444 (0.218)	0.0168 (0.828)	0.1427 (0.372)
All fully cash-financed M&A transactions _{t-3}	0.037488 (0.541)	0.060390 (0.558)	-0.0019 (0.977)	-0.0058 (0.958)
Exogenous variables				
BBA corporate bond yield over 3-year government bond yield			-367.6180 (0.102)	556.9585 (0.138)
Value-weighted 1-year stock returns			58.1229 (0.000)***	58.7979 (0.041)**
Total number of publicly listed firms			0.0181 (0.116)	0.0816 (0.000)***
Market-to-book			-3.7146 (0.670)	-23.8732 (0.167)
Granger <i>F</i> -tests				
Lagged All fully cash-financed M&A transactions	(0.575)		(0.556)	
Lagged All fully stock-financed M&A transactions		(0.563)		(0.023)**
Adjusted R ²	0.88	0.94	0.90	0.95
Number of observations	97	97	97	97

Panel E. Stock issues and stock repurchases

	(1)	(2)	(3)	(4)
	All stock issues _t	Stock repurchases _t	All stock issues _t	Stock repurchases _t
Constant	96.0215 (0.000)***	-43.9288 (0.097)*	-38.0323 (0.616)	-337.0840 (0.006)***
Endogenous variables				
All stock issues _{t-1}	0.47981 (0.000)***	0.18044 (0.082)*	0.1827 (0.039)**	0.1919 (0.148)
All stock issues _{t-2}	0.49075 (0.000)***	0.25396 (0.092)*	0.4514 (0.000)***	0.0813 (0.552)
All stock issues _{t-3}	-0.42122 (0.000)***	-0.041944 (0.773)	-0.2058 (0.027)**	-0.2121 (0.242)
Stock repurchases _{t-1}	-0.13710 (0.043)**	0.40237 (0.020)**	-0.2082 (0.006)***	0.2588 (0.129)
Stock repurchases _{t-2}	0.22502 (0.001)***	0.16082 (0.179)	0.1685 (0.012)**	-0.0130 (0.895)
Stock repurchases _{t-3}	-0.023885 (0.692)	0.17436 (0.071)*	0.0021 (0.978)	-0.0815 (0.467)
Exogenous variables				
BBA corporate bond yield over 3-year government bond yield			1331.8 (0.024)**	-1828.3 (0.010)***
Value-weighted 1-year stock returns			206.9442 (0.000)***	-78.1753 (0.322)
Total number of publicly listed firms			0.0097 (0.517)	0.0848 (0.002)***
Market-to-book			19.4468 (0.324)	-32.5164 (0.176)
Granger <i>F</i> -tests				
Lagged Stock repurchases	(0.012)**		(0.003)***	
Lagged All stock issues		(0.018)**		(0.437)
Adjusted R ²	0.45	0.47	0.59	0.55
Number of observations	97	97	97	97

Panel F. Stock-financed M&A and stock repurchases

	(1)	(2)	(3)	(4)
	All fully stock-financed M&A transactions _t	Stock repurchases _t	All fully stock-financed M&A transactions _t	Stock repurchases _t
Constant	4.4758 (0.306)	23.1269 (0.289)	-29.9778 (0.446)	-381.0505 (0.059)*
Endogenous variables				
All fully stock-financed M&A transactions _{t-1}	0.5891 (0.000)***	0.9984 (0.061)*	0.4473 (0.001)***	0.6309 (0.218)
All fully stock-financed M&A transactions _{t-2}	0.2642 (0.066)*	-0.3161 (0.559)	0.2207 (0.083)*	-0.6198 (0.299)
All fully stock-financed M&A transactions _{t-3}	0.0424 (0.692)	0.0435 (0.903)	0.1881 (0.074)*	-0.0474 (0.898)
Stock repurchases _{t-1}	-0.0215 (0.486)	0.3494 (0.041)**	-0.0327 (0.351)	0.2452 (0.203)
Stock repurchases _{t-2}	0.0302 (0.335)	0.0360 (0.667)	0.0078 (0.730)	-0.0697 (0.532)
Stock repurchases _{t-3}	0.0343 (0.306)	0.0414 (0.478)	0.0174 (0.457)	-0.0671 (0.447)
Exogenous variables				
BBA corporate bond yield over 3-year government bond yield			-429.5805 (0.063)*	-1453.7 (0.014)**
Value-weighted 1-year stock returns			50.6198 (0.000)***	-23.5495 (0.616)
Total number of publicly listed firms			0.0074 (0.408)	0.0960 (0.042)**
Market-to-book			-0.2709 (0.976)	-44.3218 (0.111)
Granger <i>F</i> -tests				
Lagged Stock repurchases	(0.233)		(0.535)	
Lagged All fully stock-financed M&A transactions		(0.001)***		(0.349)
Adjusted R ²	0.88	0.50	0.90	0.55
Number of observations	97	97	97	97

Table 6

Likelihood of overlapping, preceding and following corporate event waves

The table reports logit estimates of the likelihood of preceding, overlapping, and following waves of different corporate events. Our sample consists of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. We define waves for each corporate event using the following approach. Each quarter we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave. The table reports the number of wave quarters of one type of event preceding the beginning of a wave of another event, overlapping with quarters of another event or following the end of the wave of another event. For example, whenever one quarter of event A is part of a wave and the same quarter of event B is also a part of a wave, then this quarter is counted as part of an overlapping wave between events A and B. For all quarters when there are non-overlapping waves between A and B, we count how many non-overlapping quarters of an A wave precede the beginning of a B wave, and classify these quarters as quarters when an A wave precedes the beginning of a B wave (for non-overlapping quarters following a wave we count how many non-overlapping quarters of an A wave follow the end of a B wave, and classify these quarters as quarters when an A wave follows the end of a B wave). Whenever there is a wave of A preceding a wave of B but there is no overlapping quarter between the two, we count how many quarters of A precede the beginning of B for up to 2 years (eight quarters) before the beginning of B. We classify these quarters as quarters when A precedes the beginning of B. At the same time, we count the same number of quarters as quarters when B follows the end of A. Subsequently, we count how many preceding, overlapping and following quarters have been identified over the entire 25 year period and report them in the table. If there are some quarters when a wave in A precedes a wave in B and some when a wave in B precedes a wave in A during the entire sample period, we report the difference between the two. Whenever the direction of the relationship goes in the opposite direction than the one stated in the table, we report the number of quarters as negative figures in parentheses. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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. We obtain macroeconomic, stock return, and accounting data for the universe of U.S. publicly listed firms from International Financial Statistics (IFS), CRSP, COMPUSTAT, and DATASTREAM. More specifically, our variables of interest consist of quarterly observations for CRSP's value-weighted NYSE/AMEX/NASDAQ stock index and 1-year buy-and-hold returns, the difference between the BBA corporate bond yield and the 3-year government bond yield (as a proxy for financial constraints and liquidity), the total number of publicly listed firms (since our analysis is conducted on numbers series), and the market-wide market-to-book ratio. Capital expenditures (preceding year) denotes the aggregate total of four preceding quarters of market-wide capital expenditures. Capital expenditures (following year) denotes the aggregate total of four following quarters of market-wide capital expenditures. Significance levels (*p*-values) in parentheses are based on Huber-White (quasi-maximum likelihood) standard errors and co-variances. ***, **, * denote statistical significance at the 1%, 5%, and 10% level respectively.

Table 7
Industry concentration of corporate events

The table reports industry concentration of corporate events. Our sample consists of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. We define waves for each corporate event using the following approach. Each quarter we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave. The table also reports for every event the proportion of total activity attributed to firms in each industry, for the 10 industries representing more than 5% of activity over the entire 25-year period in *at least one* of the corporate events. We measure activity by the number of deals. Our classification of M&A activity is based on the industry of the acquirer, to make it more directly comparable with financing activity. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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 code	SDC industrial classification	Equivalent COMPUSTAT 2-digit SIC code	Proportion of total activity (Number of waves/Total length of waves in quarters)							
			All M&A	100% stock-financed M&A	100% cash-financed M&A	All stock issuance	SEOs	IPOs	Debt issues	Stock repurchases
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SDC003	Oil and Gas; Petroleum Refining	13 Oil and Gas Extraction 29 Petroleum Refining and Related Industries 46 Pipelines, Excluding Natural Gas	3% (1/17)	3% (2/24)	5% (2/25)	4% (4/38)	5% (4/39)	2% (2/24)	2% (2/24)	3% (2/24)
SDC012	Drugs	2830-2839 Drugs, Medicinal Chemicals, Pharmaceutical Preparations etc.	1% (1/22)	3% (1/17)	1% (2/25)	6% (1/20)	6% (3/31)	5% (2/24)	0% (1/17)	2% (1/18)
SDC020	Electronic and Electrical Equipment	3600-3659 Electronic, Other Electrical Equipment, Excluding Computers 3670-3699 Electronic, Other Electrical Equipment, Excluding Computers	3% (1/17)	4% (1/17)	2% (1/18)	5% (2/24)	5% (2/21)	5% (1/16)	1% (2/26)	4% (1/18)

SDC024	Measuring, Medical, Photo Equipment; Clocks	38 Measuring Instruments; Photo Equipment; Watches	3% (1/18)	4% (1/17)	3% (1/18)	6% (2/24)	5% (2/24)	6% (2/24)	1% (1/17)	5% (1/17)
SDC030	Electric, Gas and Water Distribution	4900-4949 Electric, Gas Services 4960-4999 Electric, Gas Services	2% (1/17)	1% (1/14)	2% (1/17)	5% (1/17)	9% (1/17)	1% (2/22)	6% (1/17)	2% (1/20)
SDC041	Commercial Banks, Bank Holding Companies	6020-6029 Commercial Banks 6712 Offices – Bank Holding Companies	6% (1/17)	19% (2/24)	4% (1/17)	3% (2/24)	5% (2/24)	2% (2/24)	26% (1/17)	11% (1/24)
SDC042	Savings and Loans, Mutual Savings Banks	6030-6039 Savings Institutions	1% (1/17)	2% (1/17)	1% (1/17)	2% (1/23)	2% (2/23)	4% (1/24)	3% (1/17)	9% (1/22)
SDC046	Investment and Commodity Firms, Dealers, Exchanges	62 Security and Commodity Brokers 6190-6199 Finance Services 6720-6799 Investment Offices, Trusts, Investors etc.	19% (1/18)	6% (2/25)	33% (1/17)	6% (1/21)	1% (2/26)	3% (1/17)	19% (2/26)	3% (1/17)
SDC052	Business Services	7320-7371 Business Services, Computer Programming, Data Processing and Services 7373-7399 Computer Systems etc., Other Business Services 87 Engineering, Accounting, Management and Related Services	11% (1/17)	12% (1/17)	6% (1/17)	10% (1/23)	7% (1/21)	13% (1/23)	2% (1/17)	6% (1/17)
SDC053	Prepackaged Software	7372 Prepackaged Software	4% (1/17)	8% (1/17)	2% (2/24)	5% (2/24)	3% (1/24)	7% (2/24)	0% (2/24)	3% (1/21)
		Total for all industries represented in the table	53%	62%	59%	52%	48%	48%	60%	48%
		Total for all 62 industries	100% (1/17)	100% (1/19)	100% (1/18)	100% (3/31)	100% (2/25)	100% (2/24)	100% (1/17)	100% (1/19)

Table 8

Overlap of corporate events across industries

The table reports overlap of waves of different corporate events. Our sample consists of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. We define waves for each corporate event using the following approach. Each quarter we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave. The table reports the number of wave quarters of one type of event preceding the beginning of a wave of another event, overlapping with quarters of another event or following the end of the wave of another event. For example, whenever one quarter of event A is part of a wave and the same quarter of event B is also a part of a wave, then this quarter is counted as part of an overlapping wave between events A and B. For all quarters when there are non-overlapping waves between A and B, we count how many non-overlapping quarters of an A wave precede the beginning of a B wave, and classify these quarters as quarters when an A wave precedes the beginning of a B wave (for non-overlapping quarters following a wave we count how many non-overlapping quarters of an A wave follow the end of a B wave, and classify these quarters as quarters when an A wave follows the end of a B wave). Whenever there is a wave of A preceding a wave of B but there is no overlapping quarter between the two, we count how many quarters of A precede the beginning of B for up to 2 years (eight quarters) before the beginning of B. We classify these quarters as quarters when A precedes the beginning of B. At the same time, we will count the same number of quarters as quarters when B follows the end of A. Subsequently, we count how many preceding, overlapping and following quarters have been identified over the entire 25 year period and report them in the table. If there are some quarters when a wave in A precedes a wave in B and some when a wave in B precedes a wave in A during the entire sample period, we report the difference between the two. Whenever the direction of the relationship goes in the opposite direction than the one stated in the table, we report the number of quarters as negative figures in parentheses. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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. The industrial classification is explained in Table 8.

	Aggregate activity	Oil and Gas; Petroleum Refining (SDC003)	Drugs (SDC012)	Electronic and Electrical Equipment (SDC020)	Measuring, Medical, Photo Equipment; Clocks (SDC024)	Electric, Gas and Water Distribution (SDC030)	Commercial Banks, Bank Holding Companies (SDC041)	Savings and Loans, Mutual Savings Banks (SDC042)	Investment and Commodity Firms, Dealers, Exchanges (SDC046)	Business Services (SDC052)	Prepackaged Software (SDC053)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
Number of quarters when												
Stock-financed M&A vs Cash-financed M&A	Cash-financed M&A wave precedes the beginning of Stock-financed M&A wave	4	8	(12)	2	(6)	(9)	4	9	9	3	(2)
	Both Overlap	14	10	4	16	11	5	13	8	8	14	15
	Stock-financed M&A wave follows the end of Cash-financed M&A wave	5	(2)	(9)	1	(7)	(12)	7	9	16	3	(7)
Stock-financed M&A vs SEO	SEO wave precedes the beginning of Stock-financed M&A wave	5	11	7	(3)	(2)	0	6	5	(7)	10	10
	Both Overlap	8	10	0	12	11	0	4	0	10	11	14
	Stock-financed M&A wave follows the end of SEO wave	11	14	10	2	4	0	5	5	(7)	5	3
Stock-financed M&A vs IPO	IPO wave precedes the beginning of Stock-financed M&A wave	6	11	7	3	4	(4)	(3)	0	0	8	10
	Both Overlap	8	5	0	0	15	0	12	0	0	15	12
	Stock-financed M&A wave follows the end of IPO wave	11	12	7	3	2	(4)	(1)	0	0	2	5

	Stock repurchase wave <i>precedes the beginning of</i> Stock-financed M&A wave	2	2	8	9	(7)	(4)	(3)	3	13	3	4
Stock-financed M&A vs Stock repurchase	Both <i>Overlap</i>	17	10	10	9	10	10	17	17	4	14	17
	Stock-financed M&A wave <i>follows the end of</i> Stock repurchase wave	2	(3)	7	8	(7)	(10)	(7)	(2)	7	3	0
	Stock issuing wave <i>precedes the beginning of</i> Stock repurchase wave	4	(6)	(15)	0	7	0	5	0	(16)	5	5
All stock issuing vs Stock repurchase	Both <i>Overlap</i>	11	8	3	9	8	0	0	0	1	17	17
	Stock repurchase wave <i>follows the end of</i> Stock issuing wave	8	(2)	(17)	3	9	0	5	0	(20)	(1)	4
	Stock issuing wave <i>precedes the beginning of</i> Debt issuing wave	9	(5)	3	2	5	0	0	0	4	3	11
All stock issuing vs All debt issuing	Both <i>Overlap</i>	6	11	17	6	10	0	0	0	17	17	9
	Debt issuing wave <i>follows the end of</i> Stock issuing wave	11	2	0	2	7	0	0	0	8	(3)	10
	SEO wave <i>precedes the beginning of</i> IPO wave	5	1	(3)	0	(4)	2	3	(8)	0	2	0
SEO vs IPO	Both <i>Overlap</i>	13	20	20	0	11	0	11	15	0	19	22
	IPO wave <i>follows the end of</i> SEO wave	5	0	1	0	2	2	0	1	0	4	(2)

Figure 1a
Corporate events by year, 1980-2004

Number of corporate events by year for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Our preferred stock issues sample includes all public, private placement and rule 144A issues of convertible and non-convertible preferred stock. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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.

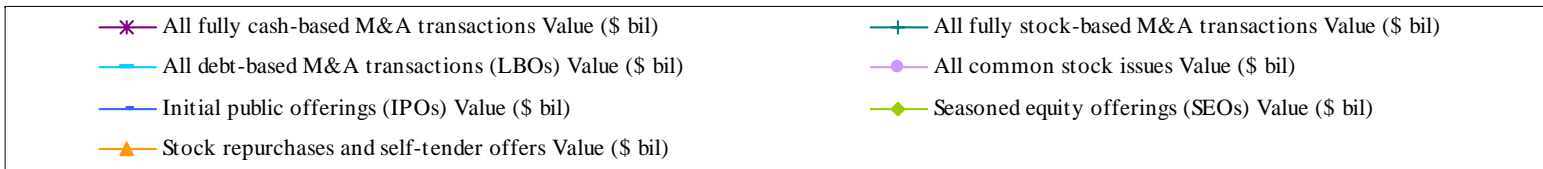
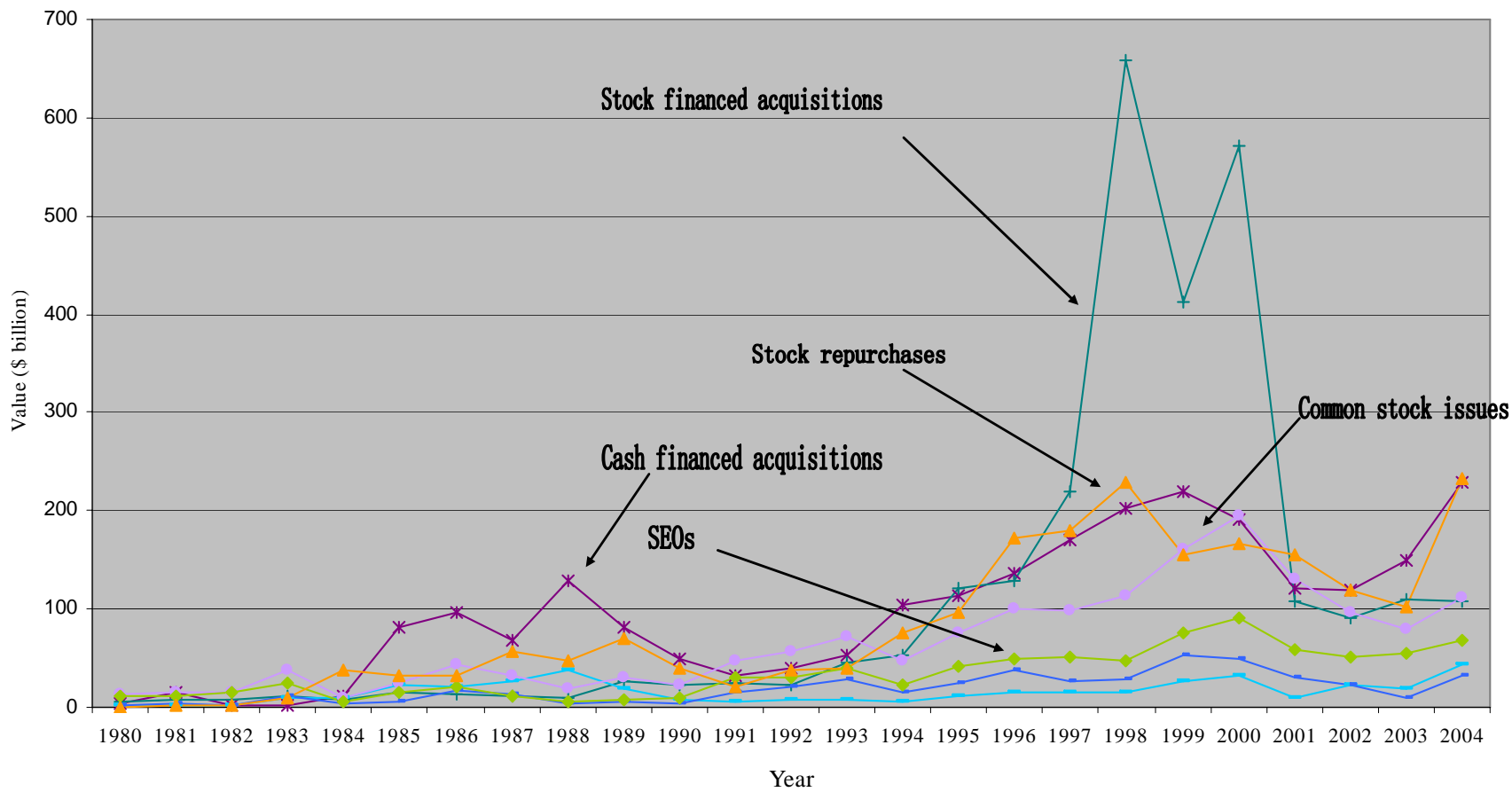


Figure 1b
Corporate events by year, 1980-1991

Number of corporate events by year for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Our preferred stock issues sample includes all public, private placement and rule 144A issues of convertible and non-convertible preferred stock. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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.

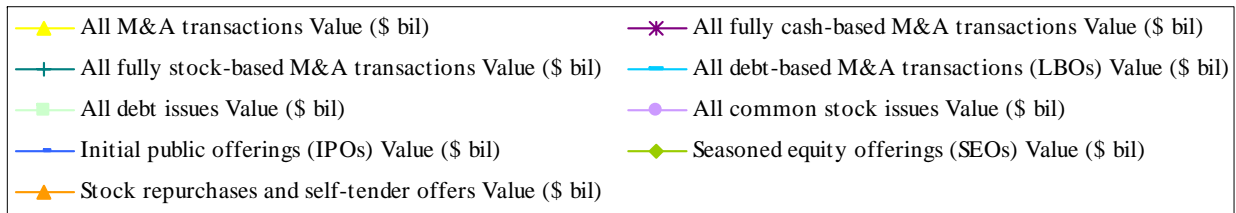
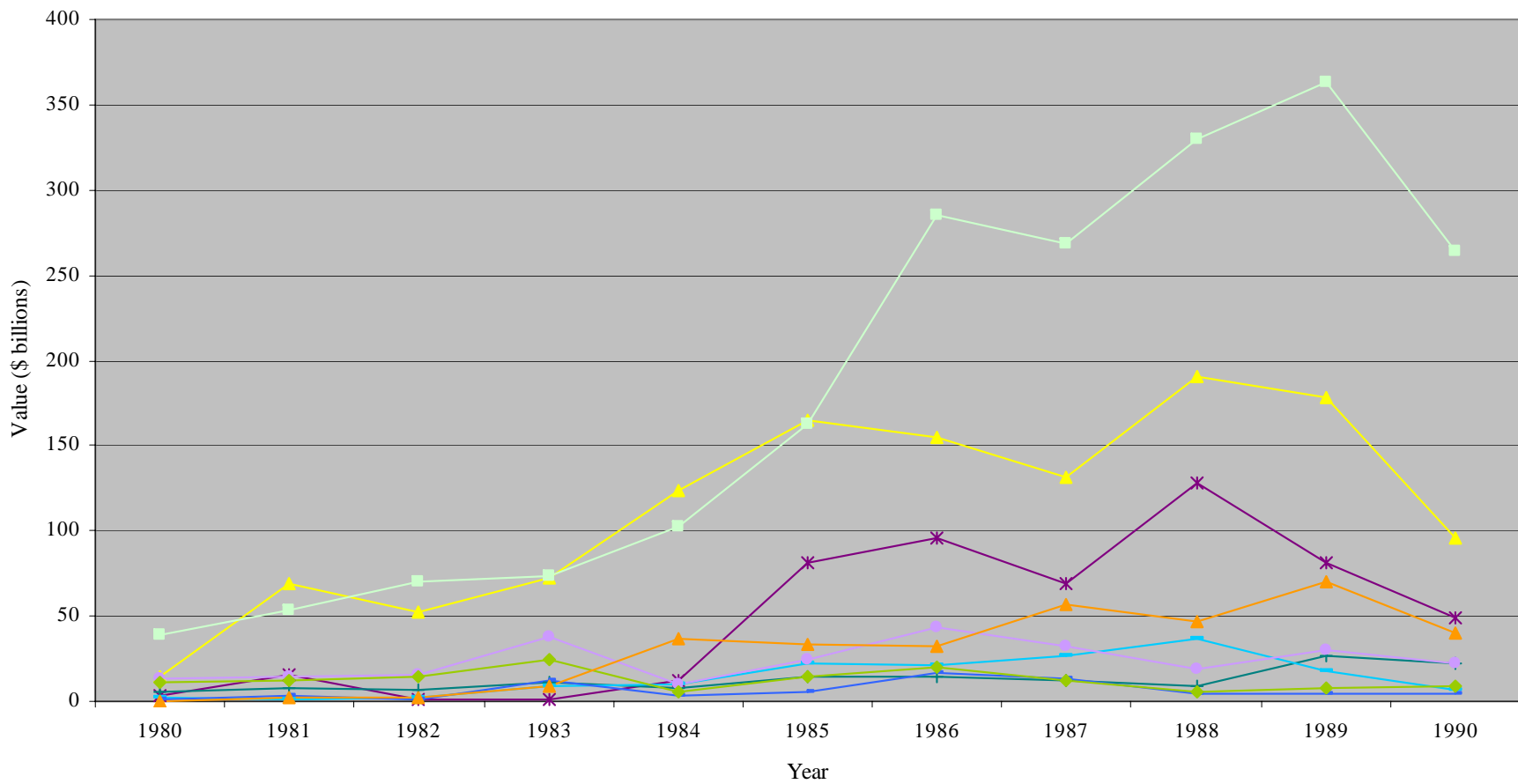


Figure 2a

Overlap between different corporate event waves (1980-1990)

Duration of waves during 1980-1990 across different types of transactions for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. We define waves for each corporate event using the following approach. Each quarter we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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.

Corporate event waves, 1980-1990

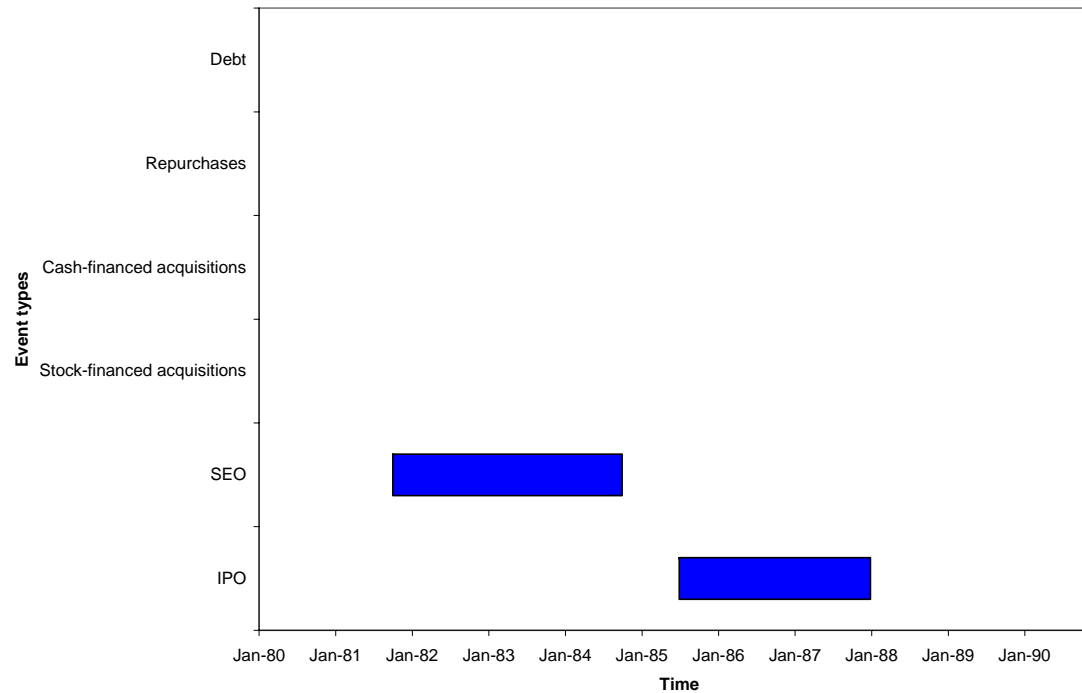


Figure 2b
Overlap between different corporate event waves (1991-2004)

Duration of waves during 1991-2004 across different types of transactions for a sample of 264,174 corporate events (100,580 merger and acquisition transactions, 106,315 debt issues, 23,389 common stock issues – of which 8,985 are IPOs and 10,077 are SEOs – 5,885 preferred stock issues, 17,342 stock repurchases, and 663 spin-offs) undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. All categories are mutually exclusive, therefore no deal is classified in more than one category. We define waves for each corporate event using the following approach. Each quarter we sum the number of transactions occurring during this and the subsequent seven quarters (i.e. over a two-year period). Therefore, each two-year period starting each quarter is identified as a potential wave. Any two-year period associated with activity higher than the 90% percentile for the whole series of rolling two-year periods is identified as a wave. Our mergers and acquisitions (M&A) sample includes mergers and acquisitions of stand alone firms, acquisitions of divested assets (defined as transactions designated as divestitures by the 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 and spin-offs. We exclude from the sample transactions by bankrupt firms (in liquidation or Chapter 11 proceedings) and the formation of joint ventures. We include only completed deals in the sample. Our common stock issues sample includes all initial public offerings (IPOs), all public issues (seasoned equity offerings; SEOs), private placements and rule 144A issues. Our debt issues sample includes all public, private placement and rule 144A convertible and non-convertible debt issues, and issues of medium-term notes. Finally, our stock repurchases sample includes all stock repurchases and self-tender offers. We exclude from the stock and debt issue samples asset-backed debt issues (because they appear to be securitizations of mortgages and other receivables), shelf-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.

Corporate event waves, 1991-2004

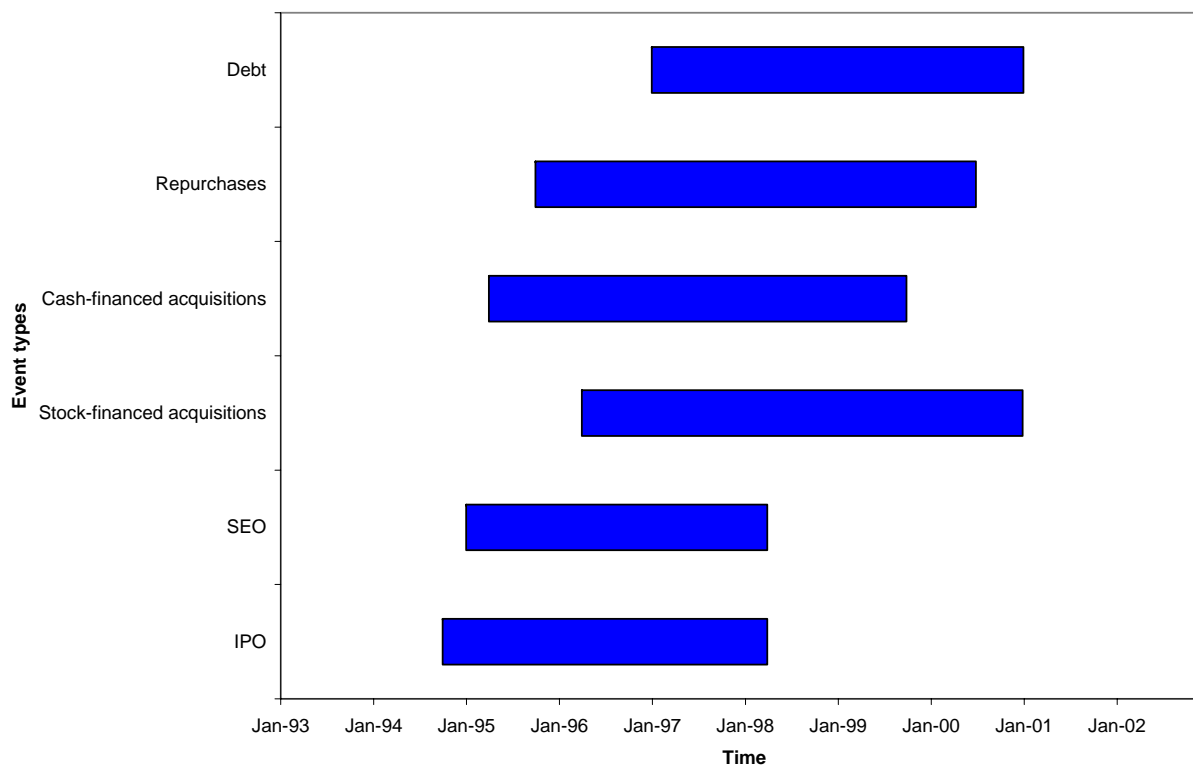


Figure 3

Stock repurchases and the value-weighted stock market index

Number of transactions for a sample of 17,342 stock repurchases undertaken by U.S. firms during 1980-2004 and obtained from the SDC database. The stock market index is CRSP's value-weighted NYSE/AMEX/NASDAQ index..

Stock repurchases and the value-weighted stock index

