1-1-2017

The Information Content of Dividend Initiation Announcements: The Case of Information Technology Firms

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Received 18 October 2015
Revised 24 March 2017
Accepted 31 March 2017

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Abstract

Purpose – The purpose of this paper is to examine the dividend initiation announcements made by firms in the information technology sector as defined in a modern system of industrial classification.
Design/methodology/approach – On the basis of a modern classification of the information technology industry, the authors examine a wide range of corporate performance and management measures to discriminate between the two theories of the information revealed by the announcement of dividend initiations, the signaling, and life cycle theories.
Findings – The empirical results are more consistent with the corporate life cycle theory of dividends than with the information signaling hypothesis. This finding helps clarify the nature of the information revealed by the announcement.
Originality/value – The paper has clear implications for investors who are interested in the growth prospects of technology firms, or for others interested in their prospective stability and degree of maturity.

Keywords Market efficiency, Information content of dividend announcements

Paper type Research paper

1. Introduction

Brav *et al.* (2005) survey 384 financial executives about their decisions to initiate the payment of cash dividends, to set the levels of subsequent dividend payments, and to manage share repurchase programs. They find that executives view distributions made via cash dividends and share repurchase very differently. They consider the initiation of payment of cash dividends as a relatively binding commitment on the part of the firm, and importantly, one that lacks the flexibility of share repurchase:

> The inflexibility of dividends, once a company starts paying then, acts as a strong deterrent to dividend initiation. CFOs argue that dividend inflexibility makes non-dividend-paying firms hesitant to begin paying dividends in the first place.

Brav *et al.* (2005) also find that subsequent decisions about the level of the dividend payments are made with a level of priority on par with that of investment decisions, and that managers are strongly averse to cutting dividends. In contrast, share repurchases offer much greater flexibility, and can be reduced or increased in ways consistent with current investment needs, liquidity, and free cash flows.

In this paper, we focus on the initiation of cash dividend payments. Because this action reflects managers' commitment to a relatively binding promise to maintain the payments in the future, it is a decision that is quite distinct from that of the much more flexible share repurchase program. Thus, our focus is not on the firm's decisions on distributions to shareholders, but instead, it is on their adoption of the policy to initiate the payment of cash dividends.

On March 19, 2012, Apple Inc. announced that it planned to pay its first quarterly cash dividends to shareholders since 1995[1]. This announcement sparked considerable investor interest in the implications for Apple's profitability and growth prospects. Its stock price rose

Managerial Finance
Vol. 43 No. 7, 2017
pp. 794-811

0307-4358
DOI 10.1108/MF-10-2015-0287

2.7 percent on that day, much higher than the 0.4 percent increase in the S&P 500 Index. Just a few weeks later, on June 12, Dell Inc., another computer manufacturer, announced its own plan to start paying dividends to shareholders later in 2012. The market also welcomed the announcement by pushing its stock price up more than 3 percent in after-hours trading. Similar news has been reported about other technology bellwether firms like Cisco Systems, Inc., Microsoft Corporation, and Hewlett-Packard Company. Some have argued that these are cases in which a technology firm matures and finds it more difficult to maintain high-growth rates and is then forced to change its dividend policies. This interpretation reflects the corporate life cycle theory of dividends.

Extending the theory of a firm's life cycle to corporate decisions, Grullon *et al.* (2002) relate changes in dividend policy to changes in a firm's life cycle as firms are more likely to pay cash dividends as they mature and their investment opportunities decline. Lower returns on investment put increasing pressure on management to return cash to shareholders. They suggest, therefore, that announcements of dividend increases contain information about changes in a firm's life cycle. When a mature firm is faced with declining returns on investment, growth rates and risk, it may begin accumulating excess cash balances. When cash balances grow to the point that they exceed what the firm can invest profitably, managers are pressed to return cash to the shareholders. The life cycle (or maturity) theory of dividends is in sharp contrast to the signaling theory of dividends, which predicts that a firm initiates (and subsequently raises) dividends to signal that its growth and profitability prospects have improved.

Do earnings indeed increase after dividend initiation announcements as the signaling theory predicts? The evidence is inconclusive. Healy and Palepu (1988) provide support to the signaling theory of dividends as firms in their dividend initiation sample continue to experience rapid earnings growth in at least the two years following their dividend initiation announcements. On the other hand, Benartzi *et al.* (1997) find no unexpected earnings growth in the years after these firms' dividend increase announcements. Dyl and Weigand (1998) also conclude that firms' earnings do not increase following the dividend increase announcements. Additional evidence provided by other researchers is reviewed below; overall, this research does not find evidence of clear linkages between announcement effects and subsequent earnings.

In this study, we focus on dividend-initiating firms and their competitors in the information technology sector. This sector is the subject of intense investor and analyst interest and has long been characterized with hyper growth, high margins, high volatility, and high risk. The life cycles of information technology firms are different than those of traditional industries because their products and services are prone to quick obsolescence. Due to heavy competition in the industry, reinvestment often has a high priority when it comes to decisions on the uses of cash and cash flows.

Any announcements that reveal information about the future prospects of these firms are of potential value to investors. Because changes in a firm's dividend policies are usually accompanied by significant announcement period returns, they convey information. However, it is critical to understand what information is actually being revealed. In this paper, we examine a wide range of corporate data on returns, assets, and profitability to answer this question for the information technology firms.

A barrier to formal research of the technology industry in the past is that this industry is not well defined in traditional industry classification systems like the Standard Industry Classification (SIC) codes. The SIC codes were originally developed by the Securities and Exchange Commission in 1937. Instead, we use the Global Industry Classification System (GICS), which was developed by MSCI and Standard and Poor's in 1999 to provide complete, standard industry definitions on a global basis. It is updated annually to ensure that it accurately represents all industries in the universe of equity investments. It particular,

GICS is much more reliable than SIC in identifying firms in recently developed and rapidly changing industries, especially those like information technology, computer technology, bio-technology, and financial services.

In addition to the use of the GICS classifications, this paper differs from prior research in several ways. First, as pointed out by Dyl and Weigand (1998), most dividend-initiating firms announce their first payout when they are relatively small in size. By contrast, information technology firms like Cisco System, Inc., Microsoft Corporation, and Hewlett-Packard Company, were already sizeable when they announced their first dividend payouts. Second, by matching these firms with non-dividend-paying firms from the same industry and with similar equity market value, we are able to study any information spillover effects of dividend initiation announcements in industries dominated by a few behemoths. Third, many prior researchers, including Howe and Shen (1998), had to drop many, if not most, NASDAQ firms in their analyses because the databases did not include their SIC codes. Because the GICS classifications are available for most of the relatively young technology firms traded in NASDAQ, our sample is much more complete.

In brief, our key empirical findings provide support to the corporate life cycle theory but not to the signaling hypothesis of dividends. We find no evidence of significant long-term excess returns in the three-year period following announcement, nor do we find increases in returns on investments or the rate of growth in sales in the following three years. Compared to their non-dividend-paying rivals, dividend-initiating technology firms have lower long-term debt burdens, lower capital expenditures, but higher cash and short-term investments. Together, these factors help explain their dividend initiation decisions in the context of the life cycle hypothesis.

The finding that dividend initiations in information technology firms are more consistent with the life cycle theory helps clarify the nature of information revealed by the announcement. It also has clear implications for investors who are interested in the growth prospects of technology firms, their prospective stability, and level of maturity.

The rest of the paper is organized as follows. We review prior studies related to dividend initiations in the next section. Our data and sample are described in Section 3. Test methodologies and empirical results are discussed in detail in Section 4. In the final section, we summarize our empirical results and draw conclusions for their implications for the conflicting signaling and life cycle hypotheses.

2. Literature review

One key aspect of dividend policy is that once a firm first pays a dividend, it subsequently tends to maintain it, and the firm's managers tend to cut or omit it in only rare circumstances. For this reason, market participants view the announcement of a dividend initiation as an informational event of potentially considerable significance. Reflecting the very rich stream of finance research literature on dividend initiations (and resumptions after several years), we review major types of empirical evidence grounded in the signaling and life cycle theories.

One of the earlier streams of research focuses on the wealth effects of the announcements. Asquith and Mullins (1983) were the first to examine the impact of dividend initiation announcements on stockholders' wealth by empirically testing 168 announcements made by firms that initiated cash dividends between 1963 and 1980. To capture the full impact of such announcements, they focus on firms announcing their first dividend payments since initial public offerings or the first time in the prior ten years. They find that dividend initiation generally increases shareholders' wealth, and that the excess returns in the post-event period are positively related to the size of the initial dividend payments. These results support the signaling theory of dividends.

Venkatesh (1989) provides empirical results on the implication of signaling theory based on the substitutability between dividends and earnings announcements, and on stock

return volatility. The information content of quarterly earnings announcements is found to decrease[2] after the introduction of cash dividends, as investors are more accurate in their earnings forecasts after dividend initiations. The author argues that after the introduction of dividends, investors are able to use information content in dividend announcements as a substitute for information revealed in earnings announcements. He also finds a decrease in the stock return volatility after the initial dividend announcement.

Michaely *et al.* (1995) examine price reactions to dividend initiation announcements made between 1964 and 1988 by firms listed in New York and American Stock Exchanges. Testing both short and long-term price effects, they find an average increase of more than 3 percent in the three-day window, and positive price drift over periods of up to five years. However, their findings on the long-term price drift are replicated by Boehme and Sorescu (2002) only for stocks in the same period and only for equally weighted portfolios. This contrary evidence suggests that the effects of dividend initiations may be heterogeneous, and clouds our understanding of what is being signaled.

Others tested the signaling theory of dividends by examining whether dividend initiations are associated with higher future earnings. Benartzi *et al.* (1997) find no evidence to support the view that changes in dividends convey information about future earnings changes. Consistent with this, Ho and Wu (2001) find that estimates of earnings increases following dividend initiations are reduced when survivorship bias is controlled for. As with the empirical findings on stock returns, others find different evidence. Lipson *et al.* (1998) find that post-announcement earnings increases and earnings surprises for dividend-initiating firms are more favorable than those for non-dividend-initiating firms. This suggests that dividends signal differences in performance between otherwise comparable firms. They also find that dividend initiations provide a valid signal to differentiate between dividend-initiating firms from otherwise comparable non-dividend-initiating firms because such firms would find it very burdensome to duplicate the initiating firm's action.

In summary, evidence on the signaling theory of dividends is mixed. Although the market response to dividend initiations is positive in the short-run, the evidence of higher subsequent stock returns and earnings is not clear. This leads to a different stream of research in this area, which shifts in focus from what the initiation decision might be signaling to what types of firms make this decision, when, and why they do so. The life cycle theory focuses on the decision to initiate dividend payments when a firm reaches a stage of maturity and has cash balances in excess of investment needs.

Howe and Shen (1998) examine characteristics other than stock and firm performance in their test of whether dividend-initiating announcements are relevant for both the announcing firms and their rivals, as the announcements may contain information about market factors or economic conditions that affect all of the firms in an industry. They examine the stock prices of industry competitors and analysts' earnings forecasts, but conclude that the information conveyed to the market by the decision to initiate dividends contains no industry-wide component. This result is instructive because it suggests that the firms that initiate dividends have unique characteristics, circumstances, and motivations not shared by other firms in the same industry.

Extending the life cycle theory of corporate decisions, Grullon *et al.* (2002) suggest that increases in dividends can signal changes in a firm's life cycle, such as a transition from a higher to a lower growth phase. As excess cash builds up, non-dividend-paying firms are forced to decide whether to use these funds in their pursuit of growth through sub-optimal investments or to return them to their owners.

DeAngelo *et al.* (2006) test the life cycle theory by looking at the firm's mix of earned and contributed capital. They find a significant relation between the initiation decision and this mix, after controlling for profitability, growth, firm size, total equity, cash balances, and dividend history. They further find that had these firms not paid dividends, their cash

balances would have been excessive and their long-term debt minimal, possibly allowing managers considerable financial freedom.

Bulan *et al.* (2007) find that dividend initiations are more likely to be announced by large profitable firms with relatively large cash balances but low earnings growth rates. They do not find shift in systematic risk or significant improvement in profitability or growth around dividend initiation announcements. They further find that dividend initiations are likely announced by firms that have reached the mature stage of their life cycles. They conclude that dividend initiators are more mature than the non-initiators; initiators are larger, more profitable, have higher cash balances, have fewer growth opportunities, and have risk characteristics resembling those of value firms. They also conclude that a high dividend premium gives a further boost to these firms' already high propensity to pay, which leads to an initiation.

Fargher and Weigand (2009) separate all dividend-initiating firms into quartiles based on their market-to-book ratios. Their findings suggest that shareholders of value stocks with lower market-to-book ratios gain the most when these firms make their dividend initiation announcements. They find no evidence that positive dividend events signal higher future profitability in all quartiles and no change in the ratio of capital expenditure to total assets for any of the quartiles. This result is consistent with the life cycle theory, as well as with the otherwise lack of clarity on the signaling theory evidence.

Our analysis of dividend initiation announcements builds on this rich stream of literature on the signaling and life cycle theories. Information technology is a particular industry of special interest to many investors. Our underlying research motivation is to determine which of the two types of theories – signaling or life cycle – is more applicable to them.

3. Data and sample

We use the Center for Research in Security Prices (CRSP) monthly databases to identify taxable cash dividends announced by NYSE/AMEX/NASDAQ companies (with Share Codes 10 and 11) between 1964 and 2011. Common shares in the CRSP monthly database with a two-digit GICS code of 45, the information technology sector, are included in our sample[3]. Our study focuses on the period between 1980 and 2010 for three reasons: although the GICS industry classification system better incorporates new industries than the SIC system, it was not generally available until the 1990s. Our study uses stringent criteria in identifying non-dividend-paying comparison or rival stocks and it was only 1979 before the number of technology common stocks reached as many as 300. Data from both CRSP and COMPUSTAT databases are needed in our post-event study, which are not available at the time of this study for dividend-initiating firms in 2011. Following prior research, we require each stock to have at least three years of data in the CRSP database.

We define a dividend initiation as the first taxable cash dividend payment reported on the CRSP database or a resumption of cash dividend payment after no cash dividends were paid for at least four years[4]. This leaves a total of 194 firms initiating or resuming their cash dividends to their shareholders between 1980 and 2010[5].

We employ two benchmarks. First, we adjust announcement period stock returns for the market, based on that stock's CRSP market capitalization decile portfolio. Second, we form a comparison sample of non-dividend-paying stocks matched on size (based on CRSP annual market-cap decile) and industry (based on eight-digit GICS code). We are able to match 182 (or 93.8 percent) of our dividend initiation sample with one or more common stocks which did not pay any cash dividends in the prior four years with the same CRSP market-cap decile and GICS industry. We identify further one or more comparison stocks with same CRSP market-cap decile and six-digit GICS code for another nine dividend-initiating firms. Comparison stocks are found for the rest of three dividend-initiating firms when the size difference is allowed within one CRSP market-cap decile.

We first examine detailed characteristics of the dividend-initiating and comparison firms to determine whether there are significant differences even after selecting them according to size and industry. A finding that the sample firms are larger, even within the same CRSP market-cap decile, is evidence supportive of the life cycle hypothesis. To more fully characterize possible differences between the sample and rival firms, we extend this analysis to several measures of profitability, leverage, liquidity, and capital expenditures. If the sample firms differ consistently in these ways from their rivals, that provides evidence in favor of the life cycle hypothesis.

We report descriptive data of several variables in Table I, using end-of-year or end-of-month data before dividend initiation announcements. We adopt the two-tailed *t*-test and Wilcoxon Signed Rank test to confirm statistical significance, and we Winsorize all data series at the 0.01 level of confidence to modify extreme values. Although the dividend-initiating technology and comparison firms are in the same CRSP market-cap decile, the average market capitalization for the announcing firms is $1.673 billion, $0.663 billion larger than that of the comparison firms. Both the *t*-statistic and the *z*-statistic of the Wilcoxon test show that the difference is statistically significant. Although the average net sales of the announcing firms are larger than those of their rivals, the difference is not statistically significant.

Dividend-initiating technology firms are significantly more profitable than comparison firms, according to return on operating assets (ROOA), return on equity, and profit

	Dividend group average	Comparison group average	*t*-statistic	Wilcoxon *z*-statistic
Size and scale				
(1) Market capitalization ($bil)	$1.673	$1.010	1.678**	2.489***
(2) CRSP market-cap decile	$5.844	$5.836	0.026	na
(3) Stock price ($/Share)	$16.04	$12.51	2.907***	4.220***
(4) Net sales ($mil)	$738.4	$622.3	0.599	0.012
Profitability				
(5) Return on operating assets	14.4%	7.8%	5.827***	6.441***
(6) Return on equity	25.5%	13.2%	3.695***	4.012***
(7) Profit margin	14.0%	−3.7%	4.372***	7.586***
(8) Market-to-book ratio	2.55	2.60	−0.176	−1.652
Liquidity and capital investments				
(9) LT debt to LT assets	18.0%	28.5%	−3.692***	−4.903***
(10) Cash equiv. to total assets	32.9%	26.7%	3.290***	3.506***
(11) Capital exp. to total assets	3.5%	5.0%	−4.363***	−6.272***
Rate of growth in sales and assets				
(12) Sales growth rate	9.0%	15.8%	−2.794***	−4.495***
(13) Total assets growth rate	12.2%	15.1%	−1.161	−1.613
Stock performance and characteristics				
(14) 12-month total return	25.7%	21.9%	0.687	0.799
(15) Turnover (daily average)	0.7%	0.9%	−2.504***	−4.943***
(16) β (1-year, daily)	0.93	1.05	−2.029***	−3.839***

Notes: The dividend group includes 199 dividend initiation and resumption announcements made by firms in the information technology sector during the period 1980-2010. For each initiating firm, the comparison group includes a non-dividend-paying firm with the same GICS industry code and CRSP market-cap decile. The difference in averages is tested for statistical significance with a two-tailed *t*-test and a non-parametric Wilcoxon signed rank test. Data are based on either the most recent year- or month-end prior to the declaration date of the dividend initiation. ***Significantly different from 0 at 0.01 level using a two-tailed test

Table I.
Descriptive statistics

margin[6] in Table I. They outperformed the comparison firms by 6.6 percent in average return-to-assets, 12.3 percent in average return-to-equity, and 17.7 percent in average profit margin; these differences are statistically significant according to both the *t*- and Wilcoxon tests. The dividend-initiating technology firms had slightly lower market-to-book ratios than the rivals, 2.55 vs 2.60 on average, using the market capitalization from prior end-of-month and book value or total common equity from prior end-of-year. However, this difference is not significant.

Turning to liquidity and capacity to invest, we find that relative to the comparison firms at the time of the announcement, the dividend-initiating firms appear to have higher liquidity, based on the ratio of cash equivalents to total assets; lower debt burdens, based on the ratio of long-term debt to long-term assets; and lower capital spending, based on the ratio of capital expenditures to total assets. In all three cases, the differences are statistically significant. These findings indicate that the initiating firms were in a better position to pay out cash dividends to their shareholders. This is consistent with the life cycle theory of dividends, as mature technology firms find themselves in better shape in terms of liquidity but dwindling investment opportunities.

Rates of growth in sales and total asset growth rates provide additional support to the life cycle theory of dividends as both of the announcing firms are lower than those of comparison firms. The average annual sales growth rate of the announcing firms is 9.0 percent, which is 6.8 percent lower than that of the rivals.

Turning last to characteristics of the firms' stocks, we find no significant difference between the initiating and comparison firms in the 12-month stock returns as both the *t*-test and the Wilcoxon test fail to negate the null hypothesis. Daily turnover as a percentage of the shares outstanding is 0.7 percent for an average dividend-initiating technology firm, 0.2 percent lower than the daily turnover of an average comparison firm. The average dividend-initiating technology firm (average one-year $\beta = 0.93$) is slightly less risky than an average firm or its non-initiating counterpart (average $\beta = 1.05$).

Overall, as compared to closely matched competitors that pay no dividends, we find the information technology firms that initiated or resumed payments of cash dividends are more profitable, have more liquid assets at hand, but have lower debt burdens and fewer investment opportunities. They trailed their competitors in rates of growth in sales and total assets. Their stocks were less risky than their competitors' stocks in terms of market-to-book ratio, share turnover in trading, and short-term β. These characteristics are consistent with the life cycle hypothesis. We next turn to tests of returns designed to distinguish directly between the applicability of the signaling and life cycle theories to information technology firms.

4. Empirical tests and results

Returns

We first explore the information content of the announcements made by the dividend-initiating firms in our sample. Focusing on both a three-day event period and a 36-month post-event period[7], we compare returns of their stocks to two benchmarks: the return of the corresponding CRSP market-cap decile portfolio and the return of the comparison stocks in the same size and industry group:

$$\text{ER.Comp}_j = \prod_{t=t_1}^{t_2}(1+R_{j,t}) - \prod_{t=t_1}^{t_2}(1+\text{RM.Comp}_t) \tag{1a}$$

$$\text{ER.Dec}_j = \prod_{t=t_1}^{t_2}(1+R_{j,t}) - \prod_{t=t_1}^{t_2}(1+\text{RM.Dec}_t) \tag{1b}$$

where $R_{j,t}$ = raw daily stock return for firm j on day t, ER.Comp$_j$ = excess return relative to the comparison stocks for firm j from time period t_1 to t_2, RM.Comp$_t$ = the return of the comparison stocks on day t, ER.Dec$_j$ = excess return relative to the comparison stocks for firm j from time period t_1 to t_2, RM.Dec$_t$ = the return of the same CRSP market-cap decile portfolio on day t.

The average excess returns of all dividend initiation announcing firms for each period are then reported and tested for statistical significance. We adopt both the three-day period, including both the days before and after each announcement, and the 36-month post-event period, to examine the short- and long-term impacts of these announcements on shareholders' wealth. Significant excess returns would support the signaling hypothesis of dividends.

Following Fargher and Weigand (2009), we also calculate risk-adjusted returns based on a single-index market model and a version of the 1993 Fama-French three-factor model that incorporates the market risk premium (MKTRF), the size premium (SMB), and the value premium (HML). Daily stock returns are from the CRSP database and time series of the three risk factors and the risk-free rate are from Dr Kenneth French's online data library at Dartmouth College:

$$R_{j,t} = \alpha_j + \beta_j \mathrm{RM}_t + \varepsilon_{j,t} \tag{2}$$

$$R_{j,t} - RF_t = \alpha_j + \beta_j (MKTRF)_t + \lambda_j (SMB)_t + \gamma_j (HML)_t + \varepsilon_{j,t} \tag{3}$$

where $R_{j,t}$ = the return of the dividend-initiating stock on day t; RM$_t$ = the return of the CRSP market-cap portfolio on day t; RF_t = the one-month Treasury Bill rate on day t; MKTRF$_t$ = Excess return on the market, defined as RM$_t$–RF$_t$; SMB$_t$ = size premium, the average return on three small portfolios minus the average return on three big portfolios; HML$_t$ = book to market premium, the average return on two value portfolios minus the average return on two growth portfolios.

The parameters in Equation (2) are estimated using daily data in a 252-day period ending five trading days before the announcement day, using the CRSP value-weighted index as a proxy for the market return, RM$_t$. We use data in the same 252-day period to estimate the parameters of Equation (3).

Overall, the initial market reaction to the dividend initiation news by an information technology firm is positive, whether after adjustment for the returns of the market or by the industry rivals' stocks. According to Panels A and B, Table II, during the three-day event period, the dividend initiation firms' stocks experience a significant return of 4.7 percent above the returns of the CRSP market-cap decile portfolios and 4.6 percent above those of the comparison stocks. These excess returns are statistically significant according to both the t-test and the Wilcoxon z-statistics.

However, the outperformance by the announcing firms' stocks does not continue after the initial three-day event period, as their half-year performances in the next three years are closely matched by those of the benchmarks. As a result, the excess returns in Panel A, Table II, are not significant under a two-tailed t-test and a Wilcoxon signed rank test.

Risk-adjusted returns from he market model in Equation (2) are significantly positive in the three-day event period (+4.3 percent, t-statistic 5.425) and the first half-year period (+5.4 percent, t-statistic 2.222), according to Panel C, Table II. However, risk-adjusted returns from the three-factor Fama-French model in Equation (3) are only significantly positive in the three-day event period (+4.4 percent, t-statistic 5.636), but not in any of the other six-month periods.

Overall, all four panels in Table II suggest that investors usually respond positively to the dividend-initiating news by technology firms, showing either significant excess returns or risk-adjusted returns in the three-day period around the announcement day. Only the

Table II.
Excess returns after dividend initiation announcements

	3-day (−1, +1)	First 6 months (+2, 127)	Second 6 months (128, 253)	Third 6 months (254, 379)	Fourth 6 months (380, 505)	Fifth 6 months (506, 631)	Sixth 6 months (632, 757)
Panel A: Excess returns: raw returns – benchmark: CRSP market-cap decile portfolio							
Value	4.7%	−1.1%	0.8%	−1.1%	2.0%	−3.5%	1.2%
t-statistic	5.197***	−0.273	0.202	−0.343	0.429	−0.872	0.302
Wilcoxon *z*-statistic	5.969***	−0.328	−0.230	−1.142	−1.109	−0.653	0.144
Panel B: Excess returns: raw returns – benchmark: comparison firms							
Value	4.6%	3.3%	2.7%	−1.0%	4.2%	−0.4%	1.8%
t-statistic	5.605***	1.111	0.906	−0.375	0.973	−0.139	0.538
Wilcoxon *z*-statistic	6.459***	0.571	−0.346	−1.498	−0.984	−0.609	−0.458
Panel C: Risk-adjusted returns based on the market model							
Value	4.3%	5.4%	2.7%	−0.5%	2.8%	−0.3%	3.0%
t-statistic	5.425***	2.222***	0.982	−0.224	0.782	−0.128	1.109
Panel D: Risk-adjusted returns based on the three-factor Fama-French model							
Value	4.4%	2.8%	2.1%	−1.5%	2.0%	−2.2%	3.3%
t-statistic	5.636***	1.268	0.869	−0.685	0.546	−1.076	1.198

Notes: Raw returns of dividend-initiating firms are adjusted for each of two benchmarks, the matching CRSP market-cap decile portfolio and comparison stocks, and tested for significance. We focus on the three-day event period, $t = -1$ to $t = +1$, where $t = 0$ denotes the initiation announcement day, as well as the 36-month post-event period. Additionally, the market model and the 1993 three-factor Fama-French model are used to estimate risk-adjusted returns for announcing firms. Both a two-tailed *t*-test and a non-parametric Wilcoxon Signed Rank test are used to confirm statistical significance. ***Significantly different from 0 at 0.01 level respectively, using a two-tailed test

market model risk-adjusted returns are significantly positive in the first six months after the initial three-day event period. All other six-month measures of excess returns or risk-adjusted returns are either inconclusive or only slightly different from zero, providing no support for a long-term impact on shareholders' wealth from the dividend initiation announcements. This evidence is not supportive of the signaling hypothesis for these firms.

Efficiency, profitability, and rate of growth in sales

Next, we explore whether dividend initiation announcements by technology firms precede changes in the announcing firms' efficiency, profitability, and rate of sales growth. We include companies with a complete seven-year (−3 to +3) history of annual items from COMPUSTAT database surrounding the year in which the dividend initiation announcements were made (year 0). The sample sizes are slightly reduced as a result of these data requirements. Three measures of profitability and rate of sales growth are adopted in this section: ROOA, annual earnings scaled by market capitalization of equity, and the rate of growth in sales.

First, as a measure of a firm's operating efficiency, the ROOA is defined as the ratio of operating income before depreciation (COMPUSTAT mnemonic OIBDP) to average total assets (AT), or:

$$\mathrm{ROOA}_{j,t} = \frac{\mathrm{OIBDP}_{j,t}}{\left(\mathrm{AT}_{j,t-1} + \mathrm{AT}_{j,t}\right)/2} \tag{4}$$

To avoid issues of negative earnings and size biases, we scale annual earnings or net income (NI) by the market value of equity right before the dividend initiation announcement, or:

$$E_{j,t} = \mathrm{NI}_{j,t}/\mathrm{MV}_{j,0}, \tag{5}$$

where $E_{j,t}$ is the annual earnings of firm j in year t, scaled by $MV_{j,0}$, the market value of equity a week before the announcement date.

The final measure, the rate of growth in sales, is defined as:

$$\text{Rate of growth in sales} = \left(\mathrm{Sale}_{j,t} - \mathrm{Sale}_{j,t-1}\right)/\mathrm{Sale}_{j,t-1} \tag{6}$$

where $\mathrm{Sale}_{j,t}$ is the firm j's annual sales in year t.

Average measures of ROOA, scaled NI, and rate of growth in sales are computed for each company in both the three-year pre-event period (−3 to −1) and the three-year post-event period (+1 to +3) in addition to the event year (0). Cross-sectional averages of the three-year pre-event period are compared to both those in the event-year period and the three-year post-event period. Profitability and growth measures of the dividend-initiating group are then compared to those of the comparison group and tested for statistical significance.

Differences for the dividend-initiating firms are presented in Panel A of Table III. The 12.8 percent average ROOA in the three-year post-event period is significantly lower than the 15.7 percent average in the post-event period, with a −1.914 t-statistic and a −2.494 Wilcoxon z-statistic. Thus the operating efficiency of dividend-initiating firms generally declines after dividend announcements. However, the post-event decrease in ROOA is not observed when we use scaled NI as the profitability measure. The average 5.2 percent ratio in the post-event period is higher than the 2.3 percent in the pre-event period, and their difference is statistically different from zero according to both tests. Although the average annual rate of growth in sales in the three-year post-event period (12.5 percent) is lower than the rate in the three-year pre-event period (14.6 percent), the difference is not significantly different zero.

	3-year pre-event average (%)	3-year post-event average (%)	*t*-statistic (%)	Wilcoxon *z*-statistic (%)
Panel A: Raw data of the dividend-initiating firms				
(1) Return on operating assets (ROOA)	15.7	12.8	−1.914*	−2.494***
(2) Net income/market cap of equity (E)	2.3	5.2	1.828*	1.822*
(3) Annual percentage change in sales (DS)	14.6	12.5	−0.624	−1.539
	Dividend group average (%)	Comparison group average (%)	*t*-statistic	Wilcoxon *z*-statistic
Panel B: Return on operating assets (ROOA)				
(4) Avg., years (−3, −1)	15.8	6.1	7.676***	8.043***
(5) Year 0	15.5	6.6	7.060***	7.450***
(6) Avg., years (+1, +3)	13.1	6.7	4.806***	5.874***
(7) Difference: Yr(0)−Yr(−3, −1)	−0.4	0.5	−0.939	−0.471
(8) Difference: Yr(+1, +3)−Yr(−3, −1)	−2.8	0.6	−2.730***	−2.961***
Panel C: Annual net income/market cap of equity (E)				
(9) Avg., years (−3, −1)	2.8	−3.3	4.064***	7.158***
(10) Year 0	5.3	−2.6	5.565***	7.195***
(11) Avg., years (+1, +3)	5.3	0.6	3.159***	4.632***
(12) Difference: Yr(0)−Yr(−3, −1)	2.5	0.7	0.937	1.720*
(13) Difference: Yr(+1, +3)−Yr(−3, −1)	2.5	3.9	−0.700	−1.759*
Panel D: Annual rate of growth in sales (%ΔS)				
(14) Avg., years (−3, −1)	14.2	15.7	−0.526	−0.652
(15) Year 0	7.4	10.3	−1.094	−0.372
(16) Avg., years (+1, +3)	10.0	8.2	1.045	1.206
(17) Difference: Yr(0)−Yr(−3, −1)	−6.8	−5.5	−0.346	0.296
(18) Difference: Yr(+1, +3)−Yr(−3, −1)	−4.2	−7.5	1.051	1.810*

Notes: We examine changes in three measures of efficiency, profitability, and rate of growth in sales around dividend initiation announcements: return on operating assets (ROOA), net income/market cap of equity (E), and rate of growth in sales (percent ΔS) of both the GICS technology dividend-initiating firms (dividend group) and comparison firms (comparison group). Only companies with a complete history of data in seven years (−3 to +3) around the year of the dividend initiation announcement (year 0) are included (The sample sizes are slightly reduced as a result of these data requirements). Firms in the comparison group are rival technology firms in the same CRSP market cap decile and GICS industry. Both a two-tailed *t*-test and a non-parametric Wilcoxon Signed Rank test are used to confirm statistical significance. *,***Significantly different from 0 at 0.10, and 0.01 levels respectively, using a two-tailed test

Table III.
Changes in efficiency, profitability, and rate of growth in sales around dividend initiation announcements by technology firms

Panel B of Table III, summarizes the differences between the dividend-initiating and comparison groups on average ROOA. The three-year pre-event average ROOA of the dividend-initiating group is 15.8 percent, two-and-half times that of the 6.1 percent of the comparison group, with a 7.676 *t*-statistic and an 8.043 Wilcoxon *z*-statistic. Clearly, dividend-initiating companies are more efficient than their rivals before the dividend announcements. The dividend-initiating companies remain more efficient than their rivals in the year that the dividend initiation is announced, as well as in the three years afterward. Although dividend-initiating technology firms are more efficient than their non-dividend-paying rivals in both the pre- and post-dividend periods, their dividend initiation announcements appear to precede a decline in their own ROOA, consistent with the life cycle theory, and contrary to the signaling hypothesis.

The results based on NI (scaled by market capitalization of equity) are presented in Panel C of Table III. Dividend-initiating technology firms continue to dominate their non-dividend-paying rivals in this category in both the pre- and post-dividend periods. Both groups are

able to generate higher NIs in the post-dividend period than in the pre-dividend period. When we compare the improvement experienced by the dividend-initiating firms to the improvement experienced by rival firms, the results are not significant.

According to Panel D of Table III, the rate of growth in sales of both groups drops in the three-year pre-dividend period, 14.2 and 15.7 percent, to a (nearly) single-digit percentage in the three-year post-dividend period, 10.0 and 8.2 percent. Both *t*- and *z*-statistics for these measures fail to provide support for a higher rate of growth in sales for dividend-initiating firms in all three periods involved, not supportive of the signaling theory. The Wilcoxon *z*-statistic (+1.810) in suggests that the slowdown in annual sales growth experienced by the dividend-initiating firms in the post-dividend period is smaller than that experienced by their non-dividend-paying rivals. Thus, dividend-initiating firms appear to be better to weather a sales slowdown in their industry than their non-dividend-paying rivals.

Debt burden, Capex, and cash

We next explore trends in three measures related to liquidity: the long-term debt to the long-term asset ratio (debt ratio), the annual capital expenditure to total assets ratio (Capex), and the cash equivalent to total assets ratio (CE)[8]. Averages of these measures are computed for each company in both the three-year pre- and post-event periods, in addition to the event year. Cross-sectional averages of the three-year pre-event period are compared to both those in the event year and the three-year post-event period. All items of the dividend-initiating group are then benchmarked relative to those of the comparison group and tested for statistical significance.

First, we examine trends in raw data of dividend-initiating firms after the initiation announcement, and present the results in Panel A of Table IV. The most notable changes appear in the debt ratio category. The average ratio of long-term debt to assets declines from 26 percent in the three-year pre-event period to 17.7 percent in the event year 0 (−1.721 *t*-statistic and a −4.592 Wilcoxon *z*-statistic), but then increases to 20.6 percent in the three-year post-event period (−1.125 *t*-statistic and a −2.798 Wilcoxon *z*-statistic). On average, dividend-initiating technology firms reduce their use of financial leverage once they start paying cash dividends. The declines in Capex in both the event year and the three-year post-event period are statistically insignificant. The average level of liquidity (CE) increases to 31.9 percent in the event year, from 28.8 percent in the three-year pre-event period. This change is marginally significant with a 1.307 *t*-statistic and a 3.570 Wilcoxon *z*-statistic. In summary, in the announcement year, dividend-initiating technology firms experience a significant decline in their debt ratios, a minor decline in Capex, but an increase in their short-term liquidity. However, the changes are only temporary, as the numbers return to levels similar to those in the three-year pre-event period.

Based on the results in Panels B to D in Table IV, dividend-initiating technology firms have, in all three periods, a lower debt ratio, a more modest Capex, and a more liquid (CE) position than their non-dividend-paying rivals. These differences are confirmed by most if not all *t*- and Wilcoxon *z*-statistics. This table helps explain why the dividend-initiating firms are in a better position to make cash dividend payouts than their non-dividend-paying rivals.

In addition, we observe from Panel B of Table IV, that both groups reduced their long-term debt burden in the event year and the three years after. Although dividend-initiating firms cut, on average, a larger percentage of debt ratio than the non-dividend-paying rivals, their debt reduction is not statistically significant. Similarly, both groups appear to spend less on Capex in the event year and the three years after (Panel C of Table IV). The reduction

	3-year pre-event average (%)	Difference (%)	*t*-statistic	Wilcoxon *z*-stat
Panel A: Raw data of the dividend-initiating firms				
(1) Debt ratio, year 0 vs pre-3Y	26.0	17.7	−1.721*	−4.592***
(2) Debt ratio, post-3Y vs pre-3Y	26.0	20.6	−1.125	−2.798***
(3) Capex, year 0 vs pre-3Y	4.9	4.6	−0.556	−0.986
(4) Capex, post-3Y vs pre-3*Y*	4.9	4.5	−0.594	−1.049
(5) Cash and equiv., year 0 vs pre-3Y	28.8	31.9	1.307	3.570***
(6) Cash and equiv., post-3Y vs pre-3Y	28.8	28.8	0.016	0.077
	Dividend group average	Comparison group average	*t*-statistic	Wilcoxon *z*-statistic
Panel B: Debt ratio: long-term debt/long-term assets				
(7) Avg in years (−3,−1)	26.9	33.4	−1.417	−3.312***
(8) Year 0	18.3	32.3	−3.190***	−4.783***
(9) Avg in years (+1,+3)	20.2	29.3	−2.426***	−4.346***
(10) Difference: Yr(0)−Yr(−3,−1)	−8.6	−1.2	−2.044***	−1.983**
(11) Difference: Yr(+1,+3)−Yr(−3,−1)	−6.7	−4.1	−0.724	−0.524
Panel C: CAPEX: capital expenditure/total assets				
(12) Avg in years (−3,−1)	4.7	6.2	−2.684***	−4.355***
(13) Year 0	4.5	5.3	−1.600	−3.472***
(14) Avg in years (+1,+3)	4.4	5.4	−1.876*	−4.165***
(15) Difference: Yr(0)−Yr(−3,−1)	−0.3	−0.9	1.489	2.389***
(16) Difference: Yr(+1,+3)−Yr(−3,−1)	−0.4	−0.8	1.145	1.540
Panel D: CE: Cash Equivalents/total assets				
(17) Avg in years (−3,−1)	29.0	26.1	1.403	1.349
(18) Year 0	32.1	25.6	3.084***	3.160***
(19) Avg in years (+1,+3)	29.2	25.2	1.953**	1.715*
(20) Difference: Yr(0)−Yr(−3,−1)	3.1	−0.5	2.927***	3.321***
(21) Difference: Yr(+1,+3)−Yr(−3,−1)	0.2	−0.8	0.748	0.859

Notes: We examine changes in three variables around dividend initiation announcements: the ratio of long-term debt to long-term assets (debt ratio), capital expenditure as a percentage of total assets (Capex), and cash plus short-term investment as a percentage of total assets (CE) of both the GICS technology firms (dividend group) and the comparison firms (comparison group). Only companies with a complete history of data in seven years (−3 to +3) around the year of the dividend initiation announcement (year 0) are included (The sample sizes are slightly reduced as a result of these data requirements). Firms in the comparison group are rival technology firms in the same CRSP market cap decile and GICS industry. Both a two-tailed *t*-test and a non-parametric Wilcoxon signed rank test are used to confirm statistical significance. *,***Significantly different from 0 at 0.10, and 0.01 levels respectively, using a two-tailed test

Table IV.
Debt burden, capital expenditures, and cash equivalents around dividend initiation announcements by technology firms

in capital expenditure as a percentage of the total assets by the non-dividend-paying firms is more severe than the percentage reduction by the dividend-initiating firms. Both *t*-statistics and Wilcoxon *z*-statistics indicate statistical significance. It appears that the decision to start cash dividend payments does not strategically affect these technology firms' abilities to make new capital investments.

Panel D of Table IV provides a possible answer to the timing of these firms' decisions to start paying cash dividends. Their average ratio of cash equivalents to total assets increases from 29.0 percent in the three-year pre-event period to 32.1 percent in the event year when the dividend decisions are announced. The average cash ratio drops in the three-year post-event period back to a level similar to that in the three-year pre-event period. The surge in liquidity (CE) in the event year experienced by the dividend-initiating firms contrasts with a slight decline for the non-dividend-paying firms in the same period. This difference is statistically significant.

Overall, the technology firms' decisions to start paying cash dividends to their shareholders appears to be justified in view of their stronger short-term liquidity positions than those of their non-dividend-paying rivals. They can afford to pay out cash dividends as well as reduce their debt ratios without sacrificing their capital expenditures. These findings provide support of the life cycle hypothesis.

β and turnover

In our last set of empirical tests, we examine changes in β from the market model using the CRSP value-weighted index as a proxy for the market and average daily turnover as a percentage of the shares outstanding in the three-year pre- and post-event periods. The null hypothesis is that there is no significant change in β and turnover after dividend initiation announcements.

First, we examine whether β or daily turnover change significantly for the dividend-initiating firms between the two three-year periods. Our results are summarized in Panel A of Table V. The average β of the dividend-initiating firms declines from 1.025 in the three-year pre-event period to 0.926 in the three-year post-event period and this change is marginally significant as the *t*-statistic is −1.563 and the Wilcoxon *z*-statistic is −2.878. At the same time, we find no significant change in daily turnover between the two three-year periods for the dividend-initiating firms, signified by low *t*-statistic and Wilcoxon *z*-statistic in Panel A.

In Panel B of Table V, average β's of the dividend-initiating firms are compared to those of their non-dividend-paying rivals. We find that average β's of the dividend-initiating firms (1.033 and 0.932) in both periods are significantly lower than those of their non-dividend-paying rivals (1.179 and 1.070). As the average β's of the non-dividend-paying firms decline by equal magnitude between the pre- and post-event periods, the change in average β's between these two stock groups is not significantly different from zero

	3-year pre-event average	3-year post-event average	*t*-statistic	Wilcoxon *z*-statistic
Panel A: Raw data of dividend initiation firms				
(1) β (Market model)	1.025	0.926	−1.563	−2.878***
(2) Average daily turnover	0.79	0.74	−0.545	−0.831
	Dividend group average	Comparison group average	*t*-statistic	Wilcoxon *z*-statistic
Panel B: β from Market Model				
(3) β in 3-yr pre-event (−3,−1)	1.033	1.179	−2.169***	−4.299***
(4) β in 3-yr post-event (+1,+3)	0.932	1.070	−2.346***	−3.832***
(5) Spread: Yr(+1,+3)-Yr(−3,−1)	−0.101	−0.109	0.150	0.850
Panel C: Daily turnover (as a percentage of shares outstanding)				
(6) Turnover in 3-yr pre-event (−3,−1)	0.81	0.97%	−1.594	−4.367***
(7) Turnover in 3-yr post-event (+1,+3)	0.75%	0.98%	−2.582***	−5.257***
(8) Spread: Yr(+1,+3)-Yr(−3,−1)	−0.06%	0.01%	−1.064	−0.819

Notes: We examine changes in β from the market model and average daily turnover as a percentage of shares outstanding from the three-year period before to the three-year after dividend initiation announcements by GICS technology firms (dividend group). Only companies with a complete history of data in seven years (−3 to +3) around the year of the dividend initiation announcement (year 0) are included. (The sample sizes are slightly reduced as a result of these data requirements). Firms in the Comparison Group are rival technology firms in the same CRSP market cap decile and GICS industry. Both a two-tailed *t*-test and a non-parametric Wilcoxon signed rank test are used to confirm statistical significance. ***Significantly different from 0 at and 0.01 levels respectively, using a two-tailed test

Table V.
β and turnover around dividend initiation announcements by technology firms

(t-statistic $= 0.150$ and Wilcoxon z-statistic $= 0.850$). Market risks faced by technology firms, both dividend-initiating firms and their non-dividend-paying rivals, seems to wane as they age.

In Panel C of Table V, average daily turnover (as percentage of shares outstanding) of the dividend-initiating firms is compared to those of their non-dividend-paying rivals. We find that average daily turnover ratios of the dividend-initiating firms (0.81 and 0.75 percent) in both periods are significantly smaller than those of the non-dividend-paying rivals (0.97 and 0.98 percent). As both groups see only minor changes in their average daily turnover in the three-year post-event period from the three-year post-event period, the change in average daily turnover between these two stock groups is not significantly different from zero (t-statistic $= -1.064$ and Wilcoxon z-statistic $= -0.819$).

On average, dividend-initiating technology firms have lower market risk as measured by β and lower common share turnover than those of their rivals in both three-year periods before and after the dividend initiation announcements. Although a marginally significant drop in β's occurs in the dividend-initiating stocks, we observe a decline in β of about equal magnitude in the comparison stocks during the same period. On the other hand, no significant change in daily turnover was observed for both groups of stocks in the post-dividend-announcement period.

5. Summary and conclusions

We examine dividend initiation news by technology firms for several reasons: the traditional SIC industry classification system is not sufficiently able to identify new industries that have developed in recent decades, such as computer technology, bio-technology, financial services, etc. The GICS industry classification system adopted in this study was developed in the 1990s, and identifies technology firms much more accurately. Information technology firms are generally considered to be high-growth, high-margin, and high-risk firms and are avidly followed by analysts and investors. The life cycles of information technology firms are different from those of traditional industries because their products and services are prone to quick obsolescence. Due to heavy competition in the industry, reinvestment often has a high priority in the use of cash and cash flows.

The empirical tests in this study cover several aspects of corporate management and performance. First, we test the information content of the dividend initiation announcements by technology firms based on their excess and risk-adjusted returns in the three-day event period and a three-year period after the announcement. We then examine their operating efficiencies, profitability, and annual sales growth trends. In the third section, we examine several variables related to the usage of cash flow and short-term liquidity. In the last section, we examine the firms' market risk and trading activities.

Overall, the market responds positively to announcements of dividend initiations by technology firms, as both significant excess returns and risk-adjusted returns in the three-day event period surrounding the announcement are observed for these firms' stocks but not for those of their rivals. However, positive excess returns and risk-adjusted returns are rare in the three years after the announcement. Only the market-model risk-adjusted returns are significantly positive in the first six-month sub-period after the initial three-day event period. All other six-month measures of excess returns or risk-adjusted returns are either inconclusive or only marginally different from zero, providing no evidence of a long-term impact on shareholders' wealth from these dividend initiation announcements. This evidence does not provide support for the signaling hypothesis.

We observe a loss of operating efficiency from the dividend-initiating firms in the three years after their initiation year. But like their rivals, dividend-initiating firms become more profitable in the post-event period as their NI (scaled by equity market value) rises in the

three years after the initiation. We observe slowdowns in annual sales growth in both groups, although this slowdown is less severe for the dividend initiation firms than for their non-dividend-paying rivals.

Our empirical results suggest that the technology firms' decisions to start paying cash dividends are well justified as well as financed. Compared to their rivals, these new dividend-paying firms have sufficient short-term liquidity to reduce their debt burden even while paying the cash dividends. More importantly, these firms accomplish all of this without sacrificing their ability to continue making capital expenditures.

Overall our empirical results provide several forms of evidence that support the corporate life cycle theory of dividend initiation. Compared to their same-sized non-dividend-paying rivals in the same industry, dividend-initiating technology firms are more efficient and profitable and have greater short-term liquidity, lower debt burdens, and fewer investment opportunities. They also trail their competitors' growth in sales and total assets. Our data suggest that their stocks are not as risky as their competitors' stocks in terms of market-to-book ratio, turnover, and one-year β. At the same time, our evidence on stock and firm performance offer no clear support of the signaling theory.

A fundamental question in research on the information revealed by dividend initiation announcements is to ask exactly what information is being revealed. According to the signaling theory, the announcement reveals information about managers' expectations that future earnings will be strong and consistent enough to support continued cash payouts. According to the life cycle theory, the announcement reveals information about their expectations that the firm will have fewer investment opportunities, even in the presence of continued ability to maintain cash payouts on a continuing basis through future earnings.

Our findings shed new light on the two competing theories of announcement information, the signaling and life cycle theories, for firms in the technology sector. While our empirical results on post-event performance of the firms' stock and operating performance fail to support the signaling theory, they do show considerable evidence supporting the life cycle theory. The additional evidence of ROOA, NI, sales growth, leverage ratio, capital expenditure, and liquidity all support the life cycle hypothesis.

Our findings are significant for investors who are interested in the growth prospects of technology firms, their prospective stability, and level of maturity. As a relatively new industry from a historical perspective, the experience of the technology industry offers insights on possible future trends in dividend theory and practice. Although our findings do not rule out the possibility that dividend initiations by firms in other industries may be more closely associated with the signaling motive than their life cycles, our analysis focusses on a modern industry that may well be as indicative of the industrial landscape of the future as steel, autos, and railroads were a century ago.

Notes

1. Combined with stock repurchase programs announced on the same day, Apple Inc. expects to spend nearly $45 billion of cash between the second half of 2012 and 2015.
2. The average price reaction to earnings announcements is smaller in the post-dividend period and the reduction is statistically significant.
3. The number of technology firms (two-digit GICS industry code $= 45$) in the CRSP database increased gradually from 320 in 1980 to a peak of 1,560 in 2000 before dropping gradually to 720 in 2010.
4. Dyl and Weigand (1998) use a four-year cutoff period, while Asquith and Mullins (1983) use a ten-year cutoff period.

5. The number of firms falls by about 10 percent between 1980 and 2010 if a ten-year, instead of a four-year, cutoff period is adopted in identifying valid dividend resuming firms.
6. The following definitions are used: Return on operating assets = operating income before depreciation (OIBDP in COMPUSTAT)/average total assets (AT in COMPUSTAT); Return on equity = operating income before depreciation/average common/ordinary equity total (CEQ); Profit margin = operating income before depreciation/net sales (SALE in COMPUSTAT).
7. The 36-month period consists of 36 consecutive 21-trading-day periods. Any periods with fewer-than-21 days are omitted.
8. All data used in this section are from annual COMPUSTAT databases: Long-term debt (COMPUSTAT mnemonic DLTT), Long-term debt = total assets (AT) – total current assets (ACT), Capital expenditure (CAPX), Cash equivalents or cash and short-term investment (CHE).

References

Asquith, P. and Mullins, D.W. Jr (1983), "The impact of initiating dividend payments on shareholders' wealth", *Journal of Business*, Vol. 56 No. 1, pp. 77-96.

Benartzi, S., Michaely, R. and Thaler, R. (1997), "Do changes in dividends signal the future of the past?", *Journal of Finance*, Vol. 52 No. 3, pp. 1007-1034.

Boehme, R.D. and Sorescu, S.M. (2002), "The long-run performance following dividend initiations and resumptions: underreaction or product of chance?", *The Journal of Finance*, Vol. 57 No. 2, pp. 871-900.

Brav, A., Graham, J.R., Harvey, C.R. and Michaely, R. (2005), "Payout policy in the 21st century", *Journal of Financial Economics*, Vol. 77 No. 3, pp. 483-527.

Bulan, L., Subramanian, N. and Tanlu, L. (2007), "On the timing of dividend initiations", *Financial Management*, Vol. 36 No. 4, pp. 31-65.

DeAngelo, H., DeAngelo, L. and Stulz, R.M. (2006), "Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory", *Journal of Financial Economics*, Vol. 81 No. 2, pp. 227-254.

Dyl, E.A. and Weigand, R.A. (1998), "The information content of dividend initiations: additional evidence", *Financial Management*, Vol. 27 No. 3, pp. 27-35.

Fargher, N.L. and Weigand, R.A. (2009), "Cross-sectional differences in the profits, returns and risk of firms initiating dividends", *Managerial Finance*, Vol. 35 No. 6, pp. 509-530.

Grullon, G., Michaely, R. and Swaminathan, B. (2002), "Are dividend changes a sign of firm maturity?", *Journal of Business*, Vol. 75 No. 3, pp. 387-424.

Healy, P.M. and Palepu, K.G. (1988), "Earnings information conveyed by dividend initiations and omissions", *Journal of Financial Economics*, Vol. 21 No. 2, pp. 149-175.

Ho, S.-J.K. and Wu, C. (2001), "The earnings information content of dividend initiations and omissions", *Journal of Business Finance & Accounting*, Vol. 28 Nos 7/8, pp. 963-977.

Howe, J.S. and Shen, Y.-P. (1998), "Information associated with dividend initiations: firm-specific or industry-wide?", *Financial Management*, Vol. 27 No. 3, pp. 17-26.

Lipson, M.L., Maquieira, C.P. and Megginson, W. (1998), "Dividend initiations and earnings surprises", *Financial Management*, Vol. 27 No. 3, pp. 36-45.

Michaely, R., Thaler, R.H. and Womack, K.L. (1995), "Price reactions to dividend initiations and omissions: overreaction or drift?", *Journal of Finance*, Vol. 50 No. 2, pp. 573-608.

Venkatesh, P.C. (1989), "The impact of dividend initiation on the information content of earnings announcements and returns volatility", *Journal of Business*, Vol. 62 No. 2, pp. 175-197.

Further reading

Brav, A., Graham, J.R., Harvey, C.R. and Michaely, R. (2008), "Managerial response to the May 2003 dividend tax cut", *Financial Management*, Vol. 37 No. 4, pp. 611-624.

Kale, J.R., Kini, O. and Payne, J.D. (2012), "The dividend initiation decision of newly public firms: some evidence on signaling with dividends", *Journal of Financial and Quantitative Analysis*, Vol. 47 No. 2, pp. 365-396.

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