

Long-Term Stock Performance following Extraordinary and Special Cash Dividends

Abstract

Using essentially all declared extraordinary and special cash dividends between 1926 and 2001 which are not preceded or followed by the same for a period of three years, we find no robust post-declaration long-term abnormal stock returns, even in sub-samples defined by the special dividend yield, the bang-for-the-buck, the declaration-month abnormal return, the sub-sampling period or the stock market condition at declaration. Only event firms in the smallest CRSP market capitalization quintile display significant positive abnormal returns during the first-year following the declaration. However, these latter are not robust across sub-sampling periods. Overall, there is no compelling evidence investors under- or over-react to extraordinary or special cash dividends.

There is burgeoning evidence that investors react inefficiently to bad news but efficiently to good news. For example, while Liu, Szewczyk and Zantout (2003) report robust and significant long-term abnormal stock returns *in the first year* following dividend reductions and omissions, Boehme and Sorescu (2002) find no evidence of robust long-term abnormal stock returns following dividend initiations and resumptions, despite the fact that both studies use identical methodologies and have large samples that go back to 1927.¹ Also, while Dichev and Piotroski (2001) report significant and robust negative abnormal returns *in the first year* following bond ratings downgrades, they find no reliable abnormal returns following bond ratings upgrades in a sample that includes all Moody's bond ratings changes between 1970 and 1997. Moreover, while Chan (2003) reports that stocks that had bad public news continue to have a robust and significant negative drift for *up to one year* after the (bad) news, he finds that stocks that had good news show less post-event drift and mainly for smaller, more illiquid stocks, using a sample that includes about one-fourth of all CRSP stocks between 1980 and 2000.

This asymmetric investor response to good versus bad corporate news is intriguing, because neither the rational expectations model nor any of the models that propose some investor cognitive bias(es) (e.g., Barberis, Shleifer and Vishny, 1998; Daniel, Hirshleifer and Subrahmanyam, 1998; Odean, 1998; Hong and Stein, 1999; Grinblatt and Han, 2005) predict an efficient investor response to good news and an inefficient response to bad news.² If this empirical observation is found true for additional corporate events and in different sampling

periods, then it will be clear that the current models in the literature fail to explain a major phenomenon and we need some new model for investor behavior. Given the importance of this issue, we contribute to the evidence on capital market efficiency and this apparent asymmetric investor response to good versus bad news by examining declarations of extraordinary and special cash dividends.

The examination of extraordinary and special cash dividends is promising for the following two reasons. First, the empirical evidence pertaining to whether investors react efficiently to all types of good dividend news, as the above “asymmetric investor response hypothesis” predicts, is inconclusive. The study of Benartzi, Michaely and Thaler (1997) which examines dividend increases,³ the study of Boehme and Sorescu (2002) which examines dividend initiations and resumptions, and the study of Byun and Rozeff (2003) which examines stock splits, all provide results that indicate no compelling or robust evidence of over- or under-reaction to these good dividend news. However, the study of Grullon and Michaely (2004) on stock repurchases finds a significant under-reaction,⁴ and there is no published study which thoroughly examines the only remaining type of good dividend news, i.e. extraordinary and special cash dividends.⁵ The evidence on this latter will be helpful in determining where the weight of the evidence lies.

Second, since regular dividend increases (or decreases) may be more permanent (Brickley, 1983), and they *may be* associated with significant post dividend-announcement earnings drifts,⁶ then any post-announcement long-term abnormal returns may be attributed to these latter. On the other hand, extraordinary and special cash dividends are one-time payments (i.e., not sticky), Lie (2000) finds that, in contrast to dividend increases, they are made by firms with non-recurring excess funds, and Brickley (1983) and Lie (2000) report that, while they are associated with increases in earnings during the fiscal year of the event, they are not associated with any

increases in earnings during the year following the event (i.e., they are transitory).⁷ Therefore, examining any under- or over-reaction to these events constitutes a lower-bound test for the hypothesis of “efficient capital markets.” In other words, if investors do not efficiently interpret the information content of one-time corporate disbursements which are not followed by any earnings-drift, it is difficult to envision they can efficiently interpret the information content of corporate events which may have long-term implications and are therefore more difficult to interpret / assess.

Our sample consists of 2,282 extraordinary or special U.S. cash dividends declared over the 1926-2001 period by NYSE, Amex and Nasdaq listed firms. It includes essentially all declared extraordinary and special cash dividends over the 1926-2001 period which are not preceded or followed by the same for a period of three years. Consistent with previous studies (e.g., Brickley, 1983; Howe, He and Kao, 1992; and Lie, 2000), we find that these announcements are associated with significant positive abnormal stock returns, on the magnitude of 3 percent, during the declaration-month.⁸ We estimate the post-declaration long-term abnormal returns by applying the Fama and French (1993) three-factor model, with equally- and value-weighted portfolio returns, and with the ordinary- and weighted-least-squares estimation procedures. We find no compelling evidence that firms which declare extraordinary or special cash dividends experience any post-declaration long-term abnormal returns. The declaration-month abnormal stock return is evidently an efficient stock price response, in general.

Lie (2000) suggests that small and large disbursements may be fundamentally different, *regardless of their label*, and he recommends that researchers control for the size of the cash disbursement as they explore their motivation and wealth consequences. For this reason, we split our sample into five sub-samples defined by the ratio of the dollar amount of extraordinary or

special cash dividend divided by the share price of the firm at the end of the month prior to the dividend declaration, and then we examine the short- and long-term stock price performance in each sub-sample. We find that the declaration-month abnormal stock return is increasing in the special dividend yield, which is consistent with intuition. For example, firms in the top quintile experience a declaration-month abnormal stock return of 8.29 percent, on average, whereas firms in the bottom quintile experience a declaration-month abnormal return of 1.06 percent, on average (both are significant at the 5 percent level or better). Yet again, we find no evidence of any robust post-declaration long-term stock price drift in any of the quintiles, even in the top quintile which has an average special yield of 16.41 percent and the bottom quintile which has an average special yield of 0.19 percent. Therefore, regardless of the size / motivation of the declared extraordinary or special cash dividend, there is no compelling evidence of post-declaration long-term abnormal return.

Our sample covers a very long period and includes firms of different sizes and from different industries. Shifts in catering incentives (Baker and Wurgler, 2004), different tax regimes (i.e., cost of signaling, John and Williams, 1985) over time, and different levels of information asymmetry at the sample firms may make the extraordinary or special cash dividend declarations have a varying (short- and / or long-term) impact across years and firms, even if the declared dividend amount or yield were the same. For this reason, we split our sample into sub-samples defined by: (1) the bang-for-the-buck (i.e., the share price response per dollar of declared special dividend); (2) the declaration-month abnormal return; and (3) the sub-sampling period; and then we examine the post-declaration price drift in each sub-sample. We find no robust evidence of any post-declaration long-term abnormal return in any of these sub-samples. Therefore, whether investors' initial stock price response is large or small, relative to, or

irrespective of the amount of declared extraordinary or special cash dividend, and whatever the catering incentives and the tax regime are during the declaration month, we find no robust evidence of either stock price momentum or reversal.

Veronesi (1999) proposes that stock prices under-react to good news during bad times (i.e., bear markets). In addition, one can argue that the probability of observing long-term positive abnormal returns following bear (bull) markets is more (less) than 50 percent because of a likely rebound (reversal). Therefore, it may be that we do not find above any robust evidence of post-declaration long-term abnormal returns because the abnormal returns following bull stock markets nullify the abnormal returns following bear stock markets. For this reason, we split our sample into two sub-samples based on the condition of the stock market in the declaration-month, and then we examine the short- and long-term stock price effects in each sub-sample. We find that while the declaration-month abnormal return is statistically significant in both sub-samples, there is no evidence of any significant post-declaration long-term abnormal return in either sub-sample. Therefore, the fact we do not find evidence of post-declaration long-term abnormal returns in our sample cannot be explained by the possibility that the abnormal returns following bull stock markets nullify the abnormal returns following bear stock markets.

Finally, for completeness, we examine whether there is any pricing inefficiency in sub-samples defined by the relative size of the event-firm. We find that, while the declaration-month average abnormal return is statistically significant in all the size quintiles, only firms in the smallest-size quintile exhibit statistically significant post-declaration first-year average abnormal monthly returns on the magnitude of 0.86 to 1.36 percent. However, Fama (1998) cautions researchers that small-size firms are more likely to have spurious long-term abnormal stock performance because of model misspecification. Also, we report that at the end of year 2001

stocks in the smallest-size quintile represent only 0.32 percent of the total market capitalization of all stocks trading on NYSE, Amex and Nasdaq. Therefore, even if the pricing inefficiency for these very small-size firms were robust to different model specifications, its macro-economic significance would be very small. Nevertheless, we examine the robustness of the post-declaration price drift for these firms across different sub-sampling periods, and we find that it is not robust.

The overall conclusion of our study is that there is no convincing evidence of any stock price drift following declarations of extraordinary or special U.S. cash dividends, even when the event is economically very significant, as measured by the size of the special dividend yield or by investors' initial (relative or absolute) response to the declaration. Moreover, the initial stock price response to the declaration of extraordinary or special cash dividends is evidently efficient in different sampling-periods, in different stock market conditions, and for at least firms in the top four CRSP market capitalization quintiles. Our results are, therefore, consistent with the findings of the study of Benartzi, Michaely and Thaler (1997) which examines dividend increases, the study of Boehme and Sorescu (2002) which examines dividend initiations and resumptions, and the study of Byun and Rozeff (2003) which examines stock splits. Hopefully, future research will uncover the reason the evidence on stock repurchases (Grullon and Michaely, 2004) is the only exception among all good dividend news.

We believe that our paper makes at least two important contributions. First, it contributes to the evidence and the ongoing debate on the efficiency of U.S. capital markets, in general, by examining announcements of extraordinary and special cash dividends, whose long-term price effects are not examined thoroughly in earlier studies. We find no evidence of under- or over-reaction. Second, our paper complements the evidence on good dividend news and can be

considered to contribute to the burgeoning evidence which suggests that investors react efficiently to good news but inefficiently to bad news, as the results of the studies of Liu, Szewczyk and Zantout (2003), Boehme and Sorescu (2002), Dichev and Piotroski (2001), and Chan (2003) indicate. If this latter evidence is confirmed with additional corporate events and in different sampling periods, it will imply the need for a new investor behavior model as neither the “rational expectations model” nor any of the behavioral models that propose some investor cognitive bias(es) (e.g., Barberis, Shleifer and Vishny, 1998; Daniel, Hirshleifer and Subrahmanyam, 1998; Odean, 1998; Hong and Stein, 1999; Grinblatt and Han, 2005) predict this latter asymmetric investor response.

The remainder of this paper proceeds as follows. Section I describes the sample and the methods used to compute the declaration-month and the post-declaration long-term abnormal stock returns. Section II presents the results for the entire sample and for the different subsamples. Section III concludes the paper.

I. Methodology

A. Sample selection

We search for extraordinary and special U.S. cash dividends (i.e., distribution codes 1272, 1273, 1274 and 1278) using the database of the Center for Research in Security Prices (CRSP). We find 15,133 events over the period January 1926 through December 2001. However, since we examine post-declaration long-term abnormal returns, we exclude all events that are preceded during a period of three years and / or followed during a similar period by another similar declaration. This screening procedure results in a sample of 2,282 events that are made in the

period from February 1926 through December 2001 by NYSE, Amex and Nasdaq listed firms with sufficient data on CRSP.

We provide the chronological distribution of our sample events in Panel A of Table 1. Our sample events are clearly widely-spaced over the seventy-six-year-long study-period. The maximum number of events in any year is 134 or 5.87 percent of the sample (year 1973). We tabulate the industry representation of our sample in Panel B of Table 1. Our sample represents 563 different four-digit Standard-Industry-Classification (SIC) industries from all eight major industry groups. The largest number from one four-digit SIC industry is 101 or 4.43 percent of the 2,282 events. We additionally present the size distribution of our event firms in Panel C of Table 1 by classifying each event firm into a market capitalization quintile based on its market value as of the end of the month before the announcement date relative to the distribution of the market values of all CRSP listed firms in that year. Clearly, firms that declare extraordinary or special cash dividends are somewhat larger than the average firm in the CRSP population since 12.5 percent of our sample firms are in the smallest-size quintile compared to 18.0 percent in the fifth quintile.

We believe that the large size of our sample, the length of our study-period, and the comprehensive industry and size representation of our sample firms prevent any year, any particular economic cycle, any one type of industry, or any firm-size category from dominating our inquiry.

B. Method for measuring the short-term abnormal stock returns

We measure the short-term stock price effects of extraordinary and special dividend declarations as the declaration-month abnormal returns, as opposed to the two-day event-window abnormal return, because there are no daily data on CRSP before 1962. We use the market

model, monthly return data, the value weighted CRSP index, the OLS procedure, and a parameter estimation period from month -42 through month -7 relative to the declaration-month to compute the declaration-month abnormal return for each sample firm. We obtain the results for 1,994 (instead of 2,282) observations because of insufficient return data during the estimation period for some cases.

Not surprisingly, we find that these good dividend news are associated with a significant (at the 1 percent level) positive declaration-month abnormal return on the magnitude of 3.04 percent, with 57.02 percent of the abnormal returns being positive. The studies of Brickley (1983), Howe, He and Kao (1992) and Lie (2000) report an announcement-period average abnormal return of 2.1 percent, 3.4 percent and 3.5 percent, respectively. Therefore, our results are in line with these latter findings.

C. Method for measuring the long-term abnormal stock returns

We estimate the post-declaration long-term abnormal stock returns using the rolling portfolio method, which Fama (1998) and Mitchell and Stafford (2000) recommend over the matching method (i.e., buy-and-hold abnormal returns).⁹ For each month, we compute the equally- and value-weighted returns for (six) portfolios which contain all firms which declared an extraordinary or a special U.S. cash dividend during the preceding 1 to 12, 13 to 24, and 25 to 36, and the preceding 12, 24, and 36 calendar months, respectively. Then, we use these calendar-month event-portfolio returns (one series at a time) in the following three-factor model of Fama and French (1993): $R_{p,t} - R_{f,t} = \alpha_p + \beta_p (R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t}$ where $R_{p,t}$ represents the return on the event portfolio in month t , $R_{f,t}$ is the one-month U.S. Treasury bill rate in month t , $R_{m,t}$ is the return on the value-weighted index of all NYSE, Amex and Nasdaq listed stocks in month t , SMB_t is the difference between the returns on portfolios of small and big

stocks (below or above the NYSE median value) with about the same weighted average book-to-market value of equity ratio in month t , and HML_t is the difference between the returns on portfolios of high and low book-to-market value of equity ratio (above and below the 0.7 and 0.3 fractiles) with about the same weighted average size in month t . The intercept α_p is then interpreted as the average abnormal monthly return of the event portfolio across the 1st, 2nd or 3rd year, or across all 12, 24, or 36 months after the declaration date, as corresponds to the rolling portfolio.

We compute the post-announcement average abnormal monthly returns for post-event years one, two, and three separately to determine the duration of the declarations' effect (if there is any effect). Also, since the number of firms included in the rolling event portfolio changes through time, we apply the ordinary-least-squares (OLS) and the weighted-least-squares (WLS) methods to estimate the parameters of the three-factor model. The weights we use in the WLS model are based on the number of event firms in the monthly portfolio. Moreover, we compute the value-weighted returns using the market values of the firms in the rolling portfolio as of the end of the month before the declaration date as the weighting vector. Since the extraordinary or special cash dividend declarations in our sample are made in the period from February 1926 through December 2001, we have 910 calendar months. We determine the statistical significance of each of the average abnormal monthly returns (α_p) using the parametric t -test. The null hypothesis we test is that the estimate of α_p is equal to zero.

II. The results

A. Results for the entire sample

We begin our analyses by examining the post-declaration long-term abnormal stock returns for the entire sample. Table 2 reports the results for the first, second and third post-declaration years and for the one-, two-, and three-year post-declaration periods. The equally-weighted average abnormal monthly returns during the first-year following the declaration date, using the OLS and the WLS methods, are positive and their magnitude is close 0.18 and 0.16 percent, respectively. These monthly abnormal returns translate to only 2.18 and 1.93 percent when compounded over the one year, which is an economically small abnormal performance. In any case, while the WLS estimate of 0.16 percent is statistically significant at the 5 percent level, the OLS estimate of 0.18 percent has an unimpressive t -statistic of 1.43. Also, when portfolios are value-weighted by market capitalization, the average abnormal monthly returns during the first-year following the declaration date are much smaller in magnitude (0.02 percent), and the WLS estimate has a negative sign. Clearly, neither the magnitude, nor the sign, nor the statistical significance of the first-year post-declaration abnormal return is robust to changing the weighting method or the estimation procedure. In addition, all the abnormal returns over the second and third post-declaration years and over the two- and three-year post-declaration periods are statistically insignificant. Therefore, there is no clear evidence that investors generally under- or over-react to declarations of extraordinary or special U.S. cash dividends. We examine next whether our aggregate / general results for the entire sample mask some pricing inefficiency(ies) in some sub-samples.

B. Results for sub-samples defined by the extraordinary or special cash dividend yield

Using samples of special dividends, regular dividend increases, and self-tender offers, Lie (2000) finds support for the notion that large disbursements of funds curb potential overinvestment by managers, but small disbursements do not appear to affect the overinvestment

problem. He suggests that small and large disbursements may be fundamentally different: “It is possible that small dividends, regardless of their label, are used for reasons unrelated to agency issues, for example, to call attention to the firm. Hence researchers should control for the size of the cash disbursement as they further explore the motivation for and the wealth consequences of such transactions.” (page 245) This argument forms the rationale for our examination of the post-declaration long-term abnormal returns in five sub-samples defined by the ratio of the dollar amount of extraordinary or special dividend divided by the share price at the end of the month prior to the declaration date (i.e., the special yield).

With reference to Table 3, we rank in ascending order all our sample events according to their special yield, and then we classify them into five quintiles of (almost) equal number of observations (i.e., $(2279 / 5) = 455$ or 456). The average special dividend yield turns out equal to 0.19 percent, 0.50 percent, 0.92 percent, 1.80 percent, and 16.41 percent in quintiles 1 through 5, respectively. We present in Panel A the declaration-month average abnormal returns (AAR) and in Panel B the post-declaration first-year average abnormal monthly returns (α_p) for each of the five sub-samples (quintiles). Insufficient return data during the estimation period of the parameters of the market model for some events and missing special dividend amount for three cases reduce the number of observations in Panel A to 1,991 and in Panel B to 2,279.

Similar to Lie (2000) and consistent with intuition, we find that the declaration-month abnormal stock return is positively correlated with the declared special yield ($\rho = +0.225$) in our entire sample. By special yield sub-samples, the declaration-month abnormal stock return ranges from 1.06 percent (in the sub-sample with an average special yield of 0.19 percent) to 8.29 percent (in the sub-sample with an average special yield of 16.41 percent), and it is statistically

significant at the 5 percent level or better in all five sub-samples. The percent of positive declaration-month abnormal returns in the fifth quintile is 69.6 percent.

With reference to Panel B, neither the equally- nor the value-weighted results achieve statistical significance in quintiles 1, 2 and 3, whether estimated with OLS or WLS regressions. In quintiles 4 and 5, the equally-weighted first-year average abnormal monthly returns (α_p) are statistically significant at the 5 percent level or better. These latter translate to an abnormal performance of 4.8 to 6.4 percent during the first year following the special dividend declaration. However, the value-weighted results do not achieve statistical significance, whether estimated with OLS or WLS regressions, and the sign of the intercept from the WLS regression in the fifth quintile is negative. Therefore, whether the special yield is large or small and, therefore, no matter what is the motivation for the special dividend declaration (*a la* Lie, 2000), we find no robust evidence of post-declaration long-term abnormal returns.

C. Results for sub-samples defined by investors' initial response

Baker and Wurgler (2004) propose that investors' demand for dividends changes over time.¹⁰ In addition, since many of the dividend signaling models (e.g., John and Williams, 1985) imply that it is the taxation on dividends that is imposed on shareholders which makes them reliable signals, then an increase (decrease) in dividend taxation should increase (decrease) the bang-for-the-buck (i.e., the share price response per dollar of dividends).¹¹ Moreover, firms of different sizes, operating in different industries may have different levels of information asymmetry between their managers and investors. It follows, therefore, that our sample which covers a very long period and represents many different industries and firms of different sizes must exhibit considerable cross-sectional variation in terms of investors' initial response (i.e., the declaration-month abnormal return), even if the dividend yield were held constant. Would sub-

sample analyses based on investors' initial response (which is perhaps an outcome of the level of demand for dividends and/or the cost of signaling and/or level of information asymmetry) qualify our above general conclusion of no robust evidence of any pricing inefficiency?

We measure investors' initial response in two ways. First, with reference to Panel A in Table 4, we classify each event into one of five sub-samples defined by the bang-for-the-buck (i.e., the declaration-month abnormal stock return divided by the dollar amount of the special dividend). The bang-for-the-buck is a relative measure of investors' initial response since it measures investors' response per dollar of extraordinary or special dividend. The average bang-for-the-buck is -2.63 percent, -0.12 percent, 0.03 percent, 0.31 percent, and 2.81 percent in quintiles 1 through 5, respectively. Second, with reference to Panel B in Table 5, we classify each event into one of five sub-samples defined by the declaration-month abnormal stock return. This classification focuses on the magnitude of investors' initial response *irrespective* of the amount of extraordinary or special dividend. The average declaration-month abnormal return is -10.86 percent, -2.63 percent, 1.31 percent, 6.33 percent, and 20.85 percent in quintiles 1 through 5, respectively. Clearly, the quintiles in Panels A and B exhibit significant differences in terms of investors' initial response.

None of the results shown in Panels A or B for quintiles 1 and 2 is statistically significant. For the third quintile, although, the equally-weighted return OLS regression has a marginally significant (at the 10 percent level) intercept (α_p); neither the sign nor the magnitude of the intercept is robust across different regressions. For the fourth quintile, we observe that the WLS intercepts using equal-weighting are statistically significant at the 1 percent level. However, their statistical significance diminishes when we use value-weighting. Also, none of the OLS regression results achieves statistical significance.

For the fifth quintile, none of the results in Panel A is statistically significant, and the results for equal-weighting in Panel B are also not significant. The intercepts of the value-weighted regressions in Panel B are significant (at the 5 percent level), but they have a negative sign, which means that *if* we had robust results for quintiles 4 and 5, then we would have to conclude that investors under-react based on the results of quintile 4, but they over-react based on the results of quintile 5. Anyway, there is no robust evidence of post-declaration abnormal returns neither in the fourth nor in the fifth quintiles.

D. Results for sub-samples defined by the sub-sampling period

We continue exploring the existence of an irrational mispricing by examining the post-declaration long-term abnormal returns across various sub-periods of our seventy-six-year long study-period. In addition to the argument that catering incentives (Baker and Wurgler, 2004) and the tax regime (i.e., cost of signaling, John and Williams, 1985) changed many times during the 1926-2001 period, Fama (1998) argues that observing an equally-frequent occurrence of long-term under-reactions and over-reactions to a specific corporate event would be indicative of random chance and consistent with the ‘efficient capital markets’ hypothesis. Moreover, it may be possible that there was mispricing in earlier periods, it was recognized by investors, and has since disappeared. Furthermore, it may be that increased transparency, wider and faster diffusion of information, decreased transaction costs, and improved regulation and oversight have led to an increase in the efficiency of the capital markets, in which case, we might observe post-declaration abnormal returns that are diminishing over time.

We report in Panel A of Table 5 the declaration-month average abnormal return (AAR) for the dividend-event firms in seven sub-periods. For completeness, we also compute the average special dividend yield across these different sub-sampling periods. We find that this latter

exhibits considerable variation over time. It is equal to: 2.03 percent in the 1926-1939 period, 1.93 percent in the 1940-1949 period, 1.41 percent in the 1950-1959 period, 0.75 percent in the 1960-1969 period, 1.37 percent in the 1970-1979 period, 6.62 percent in the 1980-1989 period, and finally 7.88 percent in the 1990-2001 period. We also find a (somewhat corresponding) considerable variation in the special dividend yield over time. More specifically, it appears to be trending-up. The percent of positive abnormal returns and the magnitude and statistical significance of the average abnormal return are all increasing over time.

We report in Panel B the post-declaration first-year average abnormal monthly returns (α_p) for the dividend-event firms in the different sub-periods of our sample. In contrast to the results for the declaration-month abnormal return, we find no consistent or robust pattern or results in Panel B. While the declaration-month abnormal returns are statistically significant in all the post-1960 periods, we find statistically significant positive post-declaration abnormal returns during only the post-1980 periods. Moreover, these latter become insignificant when we use value-weighted portfolios in the three factor model. Again, these sub-sample analyses yield no compelling evidence of a pricing inefficiency.

E. Results for sub-samples defined by the condition of the stock market

We further explore the existence of some investor over- or under-reaction by examining the post-declaration long-term abnormal returns in two sub-samples defined by the condition of the stock market in the declaration month. The rationale for this sub-sample analysis is twofold. First, Veronesi (1999) presents a ‘rational expectations’ based equilibrium model of asset prices where the drift of economic fundamentals, such as dividends, shifts between two unobservable states at random times. Using their observation of past dividends, investors formulate posterior probabilities on the two states, and because they rationally anticipate that during periods of high

uncertainty their future cash flow expectations tend to react more swiftly to news, thereby increasing the asset price volatility, risk-averse investors hedge. As a consequence of this hedging behavior, prices over-react to bad news in good times *and under-react to good news in bad times*. Second, it is arguable that the probability of observing long-term under-performance following bull (bear) markets is more (less) than 50% because of a likely reversal (rebound).

We report in Panel A of Table 6 the declaration-month average abnormal returns (AAR) and in Panel B the post-declaration first-year average abnormal monthly returns (α_p) in two sub-samples defined by the stock market condition during the announcement-month. We consider a particular month a bear market month if the stock market return (measured using the value-weighted CRSP index) during that month is lower than the risk-free rate (measured by the rate on the one-month U.S. Treasury bill). We find that the declaration-month average abnormal return is positive and statistically significant in both sub-samples. However, we again find no convincing evidence of any post-declaration abnormal returns. The intercept estimate for the sub-sample of bull stock market changes its sign without ever achieving statistical significance; and while the intercept estimate for the sub-sample of bear stock market is consistently positive, it reaches marginal significance only once, using equal-weighting.

F. Results for sub-samples defined by the relative size of the event-firm

We find in Tables 2 through 6 that the equally-weighted results tend to be of greater magnitude (and sometimes closer to statistical significance) than the value-weighted results. We attempt in these final sub-sample analyses to uncover the reason for these latter results. In other words, could there be some pricing inefficiencies in sub-samples defined by firm size? Towards that end, we classify each event firm into a market capitalization quintile based on its market value as of the end of the month before the declaration date relative to the distribution of the

market values of all CRSP listed firms in that year, and then we examine the short- and long-term abnormal returns in each size quintile. Panel A in Table 7 presents the declaration-month average abnormal return (AAR) and Panel B presents the post-declaration first-year average abnormal monthly return (α_p) for the dividend-event firms in each size-quintile.

We find that firms in all five size-quintiles have a statistically significant (at the 1 percent level) positive declaration-month average abnormal return. This latter is decreasing in firm size as Panel A shows, and it ranges from a minimum of 2.03 percent for the largest-size quintile to a maximum of 5.17 percent for the smallest-size quintile. The percent of positive abnormal returns in a size-quintile varies between 54 and 62 percent. With respect to the post-declaration abnormal returns shown in Panel B, not even one of the results for size-quintiles 2, 3, 4 or 5 is close to statistical significance. However, firms in the smallest-size quintile have statistically significant (at the 1 percent level) results, whether these results are obtained from OLS or WLS regressions and whether we use equal- or value-weighting.¹² This finding explains the reason why the equally-weighted results in Tables 2 through 5 are often larger than the value-weighted results.

The monthly abnormal return for the smallest-size quintile ranges between 0.86 and 1.36 percent per month, which translates to 10.8 to 17.6 percent for the first-year. We estimate the realized equity market risk premium ($R_m - R_f$) over the 1926 to 2001 period at about 8.16 percent. Therefore, in comparison, the post-declaration first-year abnormal performance for firms in the first quintile is economically large. However, it is possible to explain this finding as a measurement error. Fama and French (1993) and Mitchell and Stafford (2000) show that even the three-factor model does not completely explain the cross-sectional variation of stock returns. In randomly chosen samples of firms with both: 1) low book-to-market ratios, and 2) small sizes,

the null hypothesis of zero abnormal return is over-rejected. For this reason, we scrutinize this finding, which is confined to firms in the smallest-size quintile, by examining its robustness across seven sub-periods of our seventy-six-year long study-period. We report the results in Table 8. Panel A reports the declaration-month average abnormal returns (AAR) and Panel B reports the post-declaration first-year average abnormal monthly returns (α_p).

We observe that the post-declaration average abnormal returns are not robust intertemporally. We also observe that while the declaration-month average abnormal returns are not significant in the 1950-1959 and the 1960-1969 periods, the post-declaration abnormal return is not significant in the 1950-1959 period, but it is statistically and economically significant in the 1960-1969 period. Moreover, while the declaration-month average abnormal returns are significant in the 1970-1979 and the 1990-2001 periods, the post-declaration abnormal return is not significant in the 1970-1979 period, but it is statistically and economically significant in the 1990-2001 period. These results show no clear pattern or robustness, and there is no convincing evidence of significant long-term post-declaration abnormal returns for firms in the smallest-size quintile. We should add further that *even if* the results for firms in the smallest-size quintile were truly robust evidence of pricing inefficiency and not a measurement problem or a mere sample-specific chance, its macro-economic significance would be very small. Using data from CRSP, we find that at the end of 2001, stocks in the smallest-size quintile represent only 0.32 percent of the total market capitalization of all stocks trading on NYSE, Amex and Nasdaq.¹³

III. Summary of findings and conclusion

We investigate whether investors react efficiently to declarations of extraordinary and special U.S. cash dividends using essentially all such events between 1926 and 2001 which are

not preceded or followed by the same for a period of three years. First, we examine the results for the entire sample (2,282 cases), and we find no robust evidence of significant post-declaration long-term abnormal stock returns. Second, we examine the results in different sub-samples to determine whether the general results mask some mispricing in some sub-sample(s). We split our sample into sub-samples defined by the additional yield resulting from the extraordinary or special dividend declaration. We find that the declaration-month abnormal return is statistically significant in all sub-samples, and there is no evidence of significant post-declaration long-term price drifts in any of these sub-samples. We examine the results in sub-samples defined by the bang-for-the-buck and by the declaration-month abnormal return. We find no robust evidence of any post-declaration long-term abnormal return in any of these sub-samples. We examine the results in seven sub-sampling periods. We find that, while the declaration-month abnormal return exhibits a positive trend over our 1926-2001 sampling period, there is no robust post-declaration long-term abnormal stock price drift in any sub-sampling period. We check the results for sub-samples defined by the condition of the stock market in the declaration-month. We find that while the declaration-month abnormal return is statistically significant in both sub-samples, there is no evidence of any significant post-declaration long-term abnormal return in either sub-sample. Finally, we examine the results for sub-samples defined by the relative size of the dividend declaring firm. We find that firms in all CRSP size quintiles have significant declaration-month abnormal returns, but only firms in the smallest-size quintile exhibit significant post-declaration long-term price drifts. However, the evidence on these latter is not robust across sub-sampling periods.

There are two major conclusions for our study. First, there is no robust or compelling evidence of any stock price drift following declarations of extraordinary or special U.S. cash

dividends. This conclusion is consistent with the empirical evidence on three other types of *good dividend news*: (1) dividend increases (Benartzi, Michaely and Thaler, 1997); (2) dividend initiations and resumptions (Boehme and Sorescu, 2002); and (3) and stock splits (Byun and Rozeff, 2003). The evidence on stock repurchases (Grullon and Michaely, 2004), therefore, stands alone among all the good dividend news. Second, our results are consistent with the growing evidence that investors react efficiently to good news but inefficiently to bad news. Consequently, if this evidence continues to grow, we will need a new investor behavior model since none of the existing models predict this “asymmetric investor response.”

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Table 1

Chronological Distribution, Industry Representation, and Firm Size Representation of the Sample of Extraordinary or Special U.S. Cash Dividend Declarations

The sample consists of 2,282 cases of extraordinary or special U.S. cash dividend declarations obtained from the database of the Center for Research in Security Prices (CRSP). The sample declarations are made in the period from February 1926 through December 2001 by NYSE, Amex or Nasdaq listed firms with sufficient data on CRSP. All the announcements in the sample are neither preceded for a period of three years nor followed for a period of three years by another similar declaration. The sample firms represent 563 different four-digit Standard Industry Classification (SIC) industries from all eight major industry groups. In Panel C, each event firm is classified into a market capitalization quintile based on its market value as of the end of the month before the announcement date relative to the distribution of the market values of all CRSP listed firms in that year.

| Panel A: Chronological distribution of the sample | | | | | | | | |
|--|-------------------------|--------------------------|-------------|-------------------------|--------------------------|-------------|-------------------------|--------------------------|
| Year | Number of events | Percent of sample | Year | Number of events | Percent of sample | Year | Number of events | Percent of sample |
| 1926 | 12 | 0.53 | 1951 | 20 | 0.88 | 1976 | 77 | 3.37 |
| 1927 | 7 | 0.31 | 1952 | 10 | 0.44 | 1977 | 48 | 2.10 |
| 1928 | 7 | 0.31 | 1953 | 22 | 0.96 | 1978 | 56 | 2.45 |
| 1929 | 24 | 1.05 | 1954 | 18 | 0.79 | 1979 | 51 | 2.23 |
| 1930 | 10 | 0.44 | 1955 | 30 | 1.31 | 1980 | 30 | 1.31 |
| 1931 | 4 | 0.18 | 1956 | 7 | 0.31 | 1981 | 29 | 1.27 |
| 1932 | 3 | 0.13 | 1957 | 14 | 0.61 | 1982 | 14 | 0.61 |
| 1933 | 2 | 0.09 | 1958 | 6 | 0.26 | 1983 | 23 | 1.01 |
| 1934 | 1 | 0.04 | 1959 | 29 | 1.27 | 1984 | 39 | 1.71 |
| 1935 | 3 | 0.13 | 1960 | 20 | 0.88 | 1985 | 38 | 1.67 |
| 1936 | 56 | 2.45 | 1961 | 9 | 0.39 | 1986 | 27 | 1.18 |
| 1937 | 27 | 1.18 | 1962 | 30 | 1.31 | 1987 | 60 | 2.63 |
| 1938 | 2 | 0.09 | 1963 | 35 | 1.53 | 1988 | 67 | 2.94 |
| 1939 | 7 | 0.31 | 1964 | 27 | 1.18 | 1989 | 80 | 3.51 |
| 1940 | 6 | 0.26 | 1965 | 28 | 1.23 | 1990 | 45 | 1.97 |
| 1941 | 16 | 0.70 | 1966 | 25 | 1.10 | 1991 | 39 | 1.71 |
| 1942 | 9 | 0.39 | 1967 | 16 | 0.70 | 1992 | 33 | 1.45 |
| 1943 | 6 | 0.26 | 1968 | 18 | 0.79 | 1993 | 67 | 2.94 |
| 1944 | 7 | 0.31 | 1969 | 13 | 0.57 | 1994 | 56 | 2.45 |
| 1945 | 2 | 0.09 | 1970 | 10 | 0.44 | 1995 | 61 | 2.67 |
| 1946 | 29 | 1.27 | 1971 | 11 | 0.48 | 1996 | 61 | 2.67 |
| 1947 | 23 | 1.01 | 1972 | 40 | 1.75 | 1997 | 59 | 2.59 |
| 1948 | 22 | 0.96 | 1973 | 134 | 5.87 | 1998 | 29 | 1.27 |
| 1949 | 8 | 0.35 | 1974 | 90 | 3.94 | 1999 | 51 | 2.23 |
| 1950 | 46 | 2.02 | 1975 | 68 | 2.98 | 2000 | 36 | 1.58 |
| | | | | | | 2001 | 37 | 1.62 |
| Total for all years | | | | | | | 2,282 | 100.0% |

Panel B: Frequency distribution of number of extraordinary or special dividends in a four-digit SIC industry

| Number of dividend events in a 4-digit SIC industry | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Number of 4-digit SIC industries having the above number of dividend events | 242 | 104 | 59 | 38 | 32 | 16 | 14 | 5 | 11 | 5 | 7 | 3 | 5 | 3 | 1 |
| The above number of 4-digit SIC industries as a percent of the 563 sample industries | 43.0 | 18.5 | 10.5 | 6.7 | 5.7 | 2.8 | 2.5 | 0.9 | 2.0 | 0.9 | 1.2 | 0.5 | 0.9 | 0.5 | 0.2 |
| Number of dividend events in a 4-digit SIC industry | 16 | 19 | 20 | 21 | 25 | 27 | 28 | 37 | 41 | 47 | 48 | 56 | 82 | 96 | 101 |
| Number of 4-digit SIC industries having the above number of dividend events | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| The above number of 4-digit SIC industries as a percent of the 563 sample industries | 0.2 | 0.4 | 0.2 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

Panel C: Firm Size Representation of the Sample

| Market capitalization quintile | Number of events | Percent of sample |
|---------------------------------------|-------------------------|--------------------------|
| Smallest-size quintile | 286 | 12.5 |
| Second quintile | 502 | 22.0 |
| Third quintile | 530 | 23.2 |
| Fourth quintile | 553 | 24.2 |
| Largest-size quintile | 411 | 18.0 |
| Total | 2,282 | 100.0% |

Table 2
Average Abnormal Monthly Returns Estimated Using the Rolling Portfolio Method Following
Extraordinary or Special U.S. Cash Dividend Declarations

This table reports the post-declaration average abnormal monthly returns (α_p), which are estimated using the rolling portfolio method. For every month, the equally- and value-weighted returns are estimated for portfolios which contain all firms which declared an extraordinary or a special cash dividend during the preceding 1 to 12, 13 to 24, and 25 to 36, and the preceding 12, 24, and 36 calendar months. Then, the calendar time event portfolio returns are used in the following three-factor model of Fama and French (1993) to estimate the portfolio's abnormal returns:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p (R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t}$$

where $R_{p,t}$ represents the return on the event portfolio in month t , $R_{f,t}$ is the one-month U.S. Treasury bill rate in month t , $R_{m,t}$ is the return on the value-weighted index of all NYSE, Amex and Nasdaq listed stocks in month t , SMB_t is the difference between the returns on portfolios of small and big stocks (below or above the NYSE median value) with about the same weighted average book-to-market value of equity ratio in month t , and HML_t is the difference between the returns on portfolios of high and low book-to-market value of equity ratio (above and below the 0.7 and 0.3 fractiles) with about the same weighted average size in month t . The intercept α_p is then interpreted as the average abnormal monthly return of the event portfolio across the 1st, 2nd or 3rd year, or across all 12, 24, or 36 months after the declaration date, as corresponds to the rolling portfolio. Since the number of firms included in the rolling event portfolio changes through time, both ordinary-least-squares (OLS) and weighted-least-squares (WLS) estimates of the intercept α_p are provided below. The weights used in the WLS model are based on the number of event firms in the monthly portfolio. Also, the value-weighted returns are computed using the market values of the firms in the rolling portfolio as of the end of the month before the announcement date as the weighting vector. The sample consists of 2,282 extraordinary or special U.S. cash dividend declarations made in the period from February 1926 through December 2001 (i.e., 910 calendar months). The statistical significance of each of the average abnormal monthly returns (α_p) is tested using the parametric t -test. The null hypothesis tested is that the estimate of α_p is equal to zero. Using the market model, monthly return data, the value weighted CRSP index, the OLS procedure, and an estimation period from month -42 through month -7 relative to the declaration-month, we find that the declaration-month average abnormal return for 1,994 of the sample firms is 3.04 percent, significant at the 1 percent level with 57.02 percent of the abnormal returns being positive. Insufficient return data during the estimation period for some cases is the reason for having 1,994 (instead of 2,282) observations. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed t -test.

| Event portfolio return | Parameter estimation method | Statistic | Post-declaration year | | | Post-declaration period | | |
|---------------------------------|-----------------------------|----------------------------|-----------------------|----------------------|----------------------|-------------------------|---------|---------|
| | | | 1 st year | 2 nd year | 3 rd year | 1 year | 2 years | 3 years |
| Equally weighted | OLS | Estimate of α_p (%) | 0.18 | -0.06 | 0.00 | 0.18 | 0.02 | 0.01 |
| | | t -statistic | 1.43 | -0.55 | 0.01 | 1.43 | 0.29 | 0.08 |
| | WLS | Estimate of α_p (%) | 0.16 | -0.05 | -0.01 | 0.16 | 0.06 | 0.03 |
| | | t -statistic | 2.15** | -0.60 | -0.18 | 2.15** | 0.96 | 0.61 |
| Value weighted | OLS | Estimate of α_p (%) | 0.02 | -0.10 | 0.13 | 0.02 | -0.07 | -0.04 |
| | | t -statistic | 0.13 | -0.72 | 0.85 | 0.13 | -0.64 | -0.40 |
| | WLS | Estimate of α_p (%) | -0.02 | -0.16 | 0.10 | -0.02 | -0.07 | -0.04 |
| | | t -statistic | -0.20 | -1.30 | 0.81 | -0.20 | -0.68 | -0.40 |
| Number of observations (months) | | | 910 | 898 | 886 | 910 | 910 | 910 |

Table 3
Declaration-Month Average Abnormal Returns and Post-Declaration First-Year Average Abnormal Monthly Returns in Sub-Samples Defined by the Special Dividend Yield

Panel A examines the declaration-month average abnormal returns (AAR) and Panel B examines the post-declaration first-year average abnormal monthly returns (α_p) for five sub-samples defined by the additional dividend yield resulting from the declaration of the extraordinary or special cash dividend. This examination is motivated by the argument of Lie (2000) that small and large disbursements may be fundamentally different, regardless of their label, and that researchers control for the size of the cash disbursement as they explore their motivation and wealth consequences. The special dividend yield is the dollar amount of extraordinary or special dividend divided by the share price at the end of the month prior to declaration date. The average special dividend yield is 0.19 percent, 0.50 percent, 0.92 percent, 1.80 percent, and 16.41 percent in quintiles 1 through 5, respectively. The announcement-month abnormal return for a firm is obtained from the market model using monthly return data, the value weighted CRSP index, and the OLS procedure. The estimation period is from month -42 through month -7 relative to the declaration-month. The sample consists of 2,282 announcements made in the period from February 1926 through December 2001. Insufficient return data during the estimation period for some events and missing dividend amount for three cases reduce the number of observations in Panel A to 1,991 events and in Panel B to 2,279. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed t -test.

| Panel A: Declaration-Month Average Abnormal Returns (AAR) | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--|
| Statistic | Sub-samples defined by special yield (from small to large) | | | | | |
| | 1 st quintile | 2 nd quintile | 3 rd quintile | 4 th quintile | 5 th quintile | |
| Declaration-month AAR (%) | 1.06 | 1.43 | 1.27 | 2.69 | 8.29 | |
| t -statistic | 2.34** | 3.06*** | 2.47** | 4.40*** | 9.20*** | |
| Percent positive | 52.0 | 52.6 | 53.3 | 56.6 | 69.6 | |
| Number of observations | 385 | 388 | 383 | 408 | 427 | |

| Panel B: Post-Declaration First-Year Average Abnormal Monthly Returns (α_p) | | | | | | | |
|--|-----------------------------|----------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Event portfolio return | Parameter estimation method | Statistic | Sub-samples defined by special yield (from small to large) | | | | |
| | | | 1 st quintile | 2 nd quintile | 3 rd quintile | 4 th quintile | 5 th quintile |
| Equally weighted | OLS | Estimate of α_p (%) | -0.27 | -0.20 | 0.26 | 0.39 | 0.52 |
| | | t -statistic | -1.47 | -1.20 | 1.33 | 2.01** | 2.03** |
| | WLS | Estimate of α_p (%) | -0.17 | 0.06 | 0.15 | 0.43 | 0.40 |
| | | t -statistic | -1.17 | 0.44 | 1.07 | 3.08*** | 2.25** |
| Value weighted | OLS | Estimate of α_p (%) | -0.17 | -0.25 | 0.27 | 0.24 | 0.25 |
| | | t -statistic | -0.76 | -1.31 | 1.18 | 1.05 | 0.93 |
| | WLS | Estimate of α_p (%) | 0.03 | -0.15 | 0.23 | 0.28 | -0.20 |
| | | t -statistic | 0.15 | -0.91 | 1.31 | 1.6 | -0.99 |
| Number of observations (months) | | | 678 | 821 | 837 | 850 | 771 |

Table 4
Post-Declaration First-Year Average Abnormal Monthly Returns in Sub-Samples Defined by the Bang for the Buck and by the Declaration-Month Abnormal Return

Panels A and B examine the post-declaration first-year abnormal returns of the dividend-event firms in sub-samples, defined by the bang-for-the-buck and the declaration-month abnormal return, respectively. The bang-for-the-buck is the declaration-month abnormal stock return divided by the dollar amount of the special dividend. This examination is motivated by the argument that changes in catering incentives (Baker and Wurgler, 2004), different tax regimes (i.e., cost of signaling, John and Williams, 1985) and different levels of information asymmetry at different firms may make the extraordinary or special cash dividend declaration have a varying investor response across years and / or firms. The average bang-for-the-buck is -2.63 percent, -0.12 percent, 0.03 percent, 0.31 percent, and 2.81 percent in quintiles 1 through 5, respectively. The average declaration-month abnormal return is -10.86 percent, -2.63 percent, 1.31 percent, 6.33 percent, and 20.85 percent in quintiles 1 through 5, respectively. The sample size is 1,991 and 1,994 for Panels A and B, respectively, because of insufficient return data during the estimation period to compute the declaration-month abnormal return for some events and missing dividend amount for three cases. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test.

| Panel A: Sub-samples defined by the bang-for-the-buck (from small to large) | | | | | | | |
|--|------------------------------------|----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Event portfolio return | Parameter estimation method | Statistic | 1st quintile | 2nd quintile | 3rd quintile | 4th quintile | 5th quintile |
| Equally weighted | OLS | Estimate of α_p (%) | 0.22 | 0.06 | 0.39 | 0.13 | 0.07 |
| | | <i>t</i> -statistic | 0.91 | 0.30 | 1.85* | 0.64 | 0.31 |
| | WLS | Estimate of α_p (%) | 0.23 | 0.05 | -0.07 | 0.50 | 0.02 |
| | | <i>t</i> -statistic | 1.30 | 0.33 | -0.50 | 2.86*** | 0.15 |
| Value weighted | OLS | Estimate of α_p (%) | 0.09 | 0.01 | 0.34 | -0.13 | 0.01 |
| | | <i>t</i> -statistic | 0.32 | 0.04 | 1.49 | -0.59 | 0.05 |
| | WLS | Estimate of α_p (%) | 0.20 | -0.04 | -0.26 | 0.21 | -0.29 |
| | | <i>t</i> -statistic | 0.94 | -0.22 | -1.46 | 1.18 | -1.33 |
| Number of observations (months) | | | 747 | 846 | 839 | 790 | 653 |
| Panel B: Sub-samples defined by the declaration-month abnormal return (from small to large) | | | | | | | |
| Event portfolio return | Parameter estimation method | Statistic | 1st quintile | 2nd quintile | 3rd quintile | 4th quintile | 5th quintile |
| Equally weighted | OLS | Estimate of α_p (%) | 0.07 | 0.27 | 0.30 | 0.31 | -0.28 |
| | | <i>t</i> -statistic | 0.29 | 1.48 | 1.85* | 1.55 | -1.32 |
| | WLS | Estimate of α_p (%) | 0.13 | 0.19 | 0.19 | 0.39 | -0.09 |
| | | <i>t</i> -statistic | 0.74 | 1.31 | 1.40 | 2.59*** | -0.52 |
| Value weighted | OLS | Estimate of α_p (%) | 0.08 | 0.06 | 0.10 | 0.30 | -0.54 |
| | | <i>t</i> -statistic | 0.31 | 0.25 | 0.53 | 1.41 | -2.26** |
| | WLS | Estimate of α_p (%) | 0.15 | -0.03 | -0.17 | 0.33 | -0.52 |
| | | <i>t</i> -statistic | 0.67 | -0.15 | -1.10 | 1.81* | -2.56** |
| Number of observations (months) | | | 803 | 822 | 831 | 767 | 768 |

Table 5
Declaration-Month Average Abnormal Returns and Post-Declaration First-Year Average Abnormal Monthly Returns in Sub-Samples Defined by Sampling Period

Panel A examines the declaration-month average abnormal returns (AAR) and Panel B examines the post-declaration first-year average abnormal monthly returns (α_p) for the dividend-event firms in seven sub-periods of our seventy-six-year long study-period. The motivation for this examination is fourfold. First, catering incentives (Baker and Wurgler, 2004) and the tax regime (i.e., cost of signaling, John and Williams, 1985) changed many times during the 1926-2001 period. Second, Fama (1998) argues that observing an equally-frequent occurrence of long-term under-reactions and over-reactions to a specific corporate event would be indicative of random chance and consistent with the ‘efficient capital markets’ hypothesis. Third, it may be possible that there was mispricing in earlier periods, it was recognized by investors, and has since disappeared. Fourth, it may be that increased transparency, wider and faster diffusion of information, decreased transaction costs, and improved regulation and oversight have led to an increase in the efficiency of the capital markets, in which case, we might observe post-declaration abnormal returns that are diminishing over time. The average special dividend yield varies across the different sampling periods, and it is respectively: 2.03 percent, 1.93 percent, 1.41 percent, 0.75 percent, 1.37 percent, 6.62 percent, and 7.88 percent. The sample consists of 2,282 announcements made in the period from February 1926 through December 2001. Insufficient return data during the estimation period for some events reduce the number of observations for Panel A to a total of 1,994 events. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test.

| Panel A: Declaration-Month Average Abnormal Returns (AAR) | | | | | | | | |
|--|--|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Statistic | | Period of extraordinary or special cash dividend declaration | | | | | | |
| | | 26-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-01 |
| Declaration-month AAR (%) | | -1.16 | 0.27 | 0.29 | 1.42 | 3.94 | 3.96 | 4.90 |
| <i>t</i> -statistic | | -1.49 | 0.36 | 0.56 | 2.35** | 6.33*** | 5.50*** | 7.25*** |
| Percent positive | | 38 | 47 | 44 | 58 | 59 | 62 | 64 |
| Number of observations | | 136 | 123 | 190 | 183 | 497 | 358 | 507 |

| Panel B: Post-Declaration First-Year Average Abnormal Monthly Returns (α_p) | | | | | | | | | |
|--|------------------------------------|----------------------------|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Event portfolio return | Parameter estimation method | Statistic | Period of extraordinary or special cash dividend declaration | | | | | | |
| | | | 26-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-01 |
| Equally weighted | OLS | Estimate of α_p (%) | 0.32 | -0.08 | -0.15 | 0.24 | 0.03 | 0.84 | 0.47 |
| | | <i>t</i> -statistic | 0.58 | -0.32 | -0.89 | 1.05 | 0.10 | 3.13*** | 2.89*** |
| | WLS | Estimate of α_p (%) | -0.17 | -0.06 | -0.19 | 0.19 | 0.14 | 0.55 | 0.39 |
| | | <i>t</i> -statistic | -0.65 | -0.30 | -1.32 | 1.01 | 0.83 | 2.46** | 2.50** |
| Value weighted | OLS | Estimate of α_p (%) | 0.23 | -0.20 | -0.03 | 0.06 | -0.28 | -0.03 | 0.44 |
| | | <i>t</i> -statistic | 0.38 | -0.63 | -0.12 | 0.20 | -0.75 | -0.08 | 1.17 |
| | WLS | Estimate of α_p (%) | -0.13 | -0.35 | -0.21 | -0.07 | 0.03 | -0.23 | 0.27 |
| | | <i>t</i> -statistic | -0.39 | -1.32 | -0.91 | -0.26 | 0.10 | -0.78 | 0.77 |
| Number of observations (months) | | | 166 | 119 | 119 | 119 | 117 | 119 | 143 |

Table 6

Declaration-Month Average Abnormal Returns and Post-Declaration First-Year Average Abnormal Monthly Returns in Sub-Samples Defined by the Condition of the Stock Market: Bear versus Bull

Panel A examines the declaration-month average abnormal returns (AAR) and Panel B examines the post-declaration first-year average abnormal monthly returns (α_p) for the dividend-event firms in two sub-samples defined by the stock market condition during the declaration-month. This examination is motivated by the prediction of the model of Veronesi (1999) that stock prices under-react to good news during bad times. It is also motivated by the argument that the probability of observing long-term under-performance following bull (bear) markets is more (less) than 50% because of a likely reversal (rebound). A month is considered a bear market month if the stock market return (measured using the value-weighted CRSP index) during that month is lower than the risk-free rate (measured by the rate on the one-month U.S. Treasury bill). The sample consists of 2,282 announcements made in the period from February 1926 through December 2001. Insufficient return data during the estimation period for some events reduce the number of observations for Panel A to a total of 1,994 events. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test.

| Panel A: Declaration-Month Average Abnormal Returns (AAR) | | | | |
|--|------------------------------------|---------------------------------|--------------------------|--------------------------|
| | | Statistic | Bear stock market | Bull stock market |
| | | Declaration-month AAR (%) | 3.71 | 2.62 |
| | | <i>t</i> -statistic | 7.08*** | 7.84*** |
| | | Percent positive | 58.6 | 56.0 |
| | | Number of observations | 754 | 1,240 |
| Panel B: Post-Declaration First-Year Average Abnormal Monthly Returns (α_p) | | | | |
| Event portfolio return | Parameter estimation method | Statistic | Bear stock market | Bull stock market |
| Equally weighted | OLS | Estimate of α_p (%) | 0.23 | 0.16 |
| | | <i>t</i> -statistic | 1.47 | 0.86 |
| | WLS | Estimate of α_p (%) | 0.16 | 0.17 |
| | | <i>t</i> -statistic | 1.77* | 1.38 |
| Value weighted | OLS | Estimate of α_p (%) | 0.14 | -0.27 |
| | | <i>t</i> -statistic | 0.80 | -1.29 |
| | WLS | Estimate of α_p (%) | 0.17 | -0.24 |
| | | <i>t</i> -statistic | 1.33 | -1.54 |
| | | Number of observations (months) | 817 | 885 |

Table 7
Declaration-Month Average Abnormal Returns and Post-Declaration First-Year Average Abnormal Monthly Returns in Sub-Samples Defined by Relative Firm Size

Panel A examines the declaration-month average abnormal returns (AAR) and Panel B examines the post-declaration first-year average abnormal monthly returns (α_p) for the dividend-event firms in five sub-samples or quintiles, defined by the market value of the event firm as of the end of the month before the declaration date relative to the size distribution of all CRSP listed firms in that year. The motivation for this examination is twofold. First, we find that at the end of 2001, stocks in the smallest-size decile represent only 0.32 percent of the total market capitalization of all stocks trading on the NYSE, Amex and Nasdaq. Second, Fama (1998) argues correctly that small- compared to large-size firms are more likely to have spurious long-term abnormal stock price performance because of model misspecification. The sample consists of 2,282 announcements made in the period from February 1926 through December 2001. Insufficient return data during the estimation period for some events reduce the number of observations for Panel A to a total of 1,994 events. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test.

| Panel A: Declaration-Month Average Abnormal Returns (AAR) | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Statistic | Sub-samples defined by firm size (from small to large) | | | | |
| | 1 st quintile | 2 nd quintile | 3 rd quintile | 4 th quintile | 5 th quintile |
| Declaration-month AAR (%) | 5.17 | 4.08 | 2.74 | 2.12 | 2.03 |
| <i>t</i> -statistic | 4.03*** | 6.52*** | 4.95*** | 4.09*** | 4.37*** |
| Percent positive | 54 | 62 | 57 | 55 | 56 |
| Number of observations | 244 | 429 | 450 | 486 | 385 |

| Panel B: Post-Declaration First-Year Average Abnormal Monthly Returns (α_p) | | | | | | | |
|--|-----------------------------|----------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Event portfolio return | Parameter estimation method | Statistic | Sub-samples defined by firm size (from small to large) | | | | |
| | | | 1 st quintile | 2 nd quintile | 3 rd quintile | 4 th quintile | 5 th quintile |
| Equally weighted | OLS | Estimate of α_p (%) | 1.24 | 0.15 | 0.05 | 0.07 | -0.02 |
| | | <i>t</i> -statistic | 4.58*** | 0.71 | 0.26 | 0.43 | -0.10 |
| | WLS | Estimate of α_p (%) | 1.36 | 0.18 | -0.07 | -0.05 | -0.16 |
| | | <i>t</i> -statistic | 5.49*** | 0.99 | -0.54 | -0.42 | -1.26 |
| Value weighted | OLS | Estimate of α_p (%) | 0.97 | 0.06 | 0.10 | 0.06 | -0.06 |
| | | <i>t</i> -statistic | 3.51*** | 0.29 | 0.50 | 0.40 | -0.30 |
| | WLS | Estimate of α_p (%) | 0.86 | 0.10 | -0.03 | -0.07 | -0.17 |
| | | <i>t</i> -statistic | 3.42*** | 0.5 | -0.21 | -0.54 | -1.21 |
| Number of observations (months) | | | 710 | 828 | 847 | 829 | 847 |

Table 8
Declaration-Month Average Abnormal Returns and Post-Declaration First-Year Average Abnormal Monthly Returns for Very Small Firms in Sub-Samples Defined by Sampling Period

Panel A examines the declaration-month average abnormal returns (AAR) and Panel B examines the post-declaration first-year average abnormal monthly returns (α_p) for the dividend-event firms classified to the smallest-size CRSP quintile, in seven sub-periods of our seventy-six-year long study period. The motivation for this examination is to test whether the post-declaration first-year abnormal return to the dividend-event firms in the smallest-size quintile is robust across the seven consecutive sub-periods of our sample. The smallest-size CRSP quintile includes 244 announcements made in the period from August 1929 through December 2001. ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed t -test.

| Panel A: Declaration-Month Average Abnormal Returns (AAR) | | | | | | | | |
|--|--|--|-------|-------|-------|--------|-------|---------|
| Statistic | | Period of extraordinary or special cash dividend declaration | | | | | | |
| | | 26-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-01 |
| Declaration-month AAR (%) | | -1.58 | -0.93 | 0.47 | -1.15 | 4.41 | 4.63 | 11.71 |
| t -statistic | | -0.41 | -0.32 | 0.34 | -0.66 | 1.97** | 1.60 | 3.64*** |
| Percent positive | | 25 | 38 | 39 | 32 | 58 | 59 | 68 |
| Number of observations | | 4 | 16 | 38 | 25 | 55 | 27 | 79 |

| Panel B: Post-Declaration First-Year Average Abnormal Monthly Returns (α_p) | | | | | | | | | |
|--|-----------------------------|----------------------------|--|--------|-------|---------|-------|---------|---------|
| Event portfolio return | Parameter estimation method | Statistic | Period of extraordinary or special cash dividend declaration | | | | | | |
| | | | 26-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-01 |
| Equally weighted | OLS | Estimate of α_p (%) | 0.99 | 1.51 | 0.30 | 1.80 | 0.32 | 2.65 | 1.71 |
| | | t -statistic | 0.45 | 2.25** | 0.66 | 2.83*** | 0.54 | 2.95*** | 2.89*** |
| | WLS | Estimate of α_p (%) | 0.24 | 1.49 | 0.29 | 1.45 | 0.78 | 2.77 | 1.88 |
| | | t -statistic | 0.13 | 2.41** | 0.79 | 2.30** | 1.46 | 3.21*** | 3.16*** |
| Value weighted | OLS | Estimate of α_p (%) | 0.63 | 1.52 | 0.19 | 1.59 | -0.23 | 2.87 | 1.14 |
| | | t -statistic | 0.29 | 2.17** | 0.42 | 2.59*** | -0.33 | 3.02*** | 2.40** |
| | WLS | Estimate of α_p (%) | -0.12 | 1.46 | 0.26 | 1.23 | -0.31 | 2.80 | 1.16 |
| | | t -statistic | -0.07 | 2.26** | 0.71 | 2.02** | -0.48 | 3.03*** | 2.62*** |
| Number of observations (months) | | | 15 | 79 | 118 | 101 | 99 | 112 | 142 |

¹ Michaely, Thaler and Womack (1995) are the first to note this asymmetric investor response. Using samples of 561 dividend initiations and 887 dividend omissions made during the 1964-1988 period, they report post-announcement long-term abnormal stock returns for omitting firms which are greater in absolute terms than those for initiating firms. They state that they cannot find any explanation for the asymmetry in investors' response. Liu, Szewczyk and Zantout (2003) use a sample of 2,337 dividend reductions or omissions from the 1927-1999 period and report significant negative post-announcement abnormal returns, which: (1) are robust to changing the specifications of computing the long-term abnormal return; (2) persist in every decade of their study-period, and (3) do not appear confined to small firms. Their overall conclusion is that investors do in fact under-react to dividend reductions and omissions. On the other hand, Boehme and Sorescu (2002) use a sample of 2,886 dividend initiations or resumptions from the 1927-1998 period and report that: (1) there is no evidence of any post-announcement abnormal price drift for the period prior to 1964; (2) when portfolios are value-weighted by market capitalization, the post-announcement abnormal returns of the post-1964 period disappear; and (3) the equally-weighted results are not robust across subsamples. Their overall conclusion is that there is no clear evidence that investors react inefficiently to dividend initiations or resumptions.

² The model of Barberis, Shleifer and Vishny (1998), which relies on the conservatism (Edwards, 1968) and representativeness (Kahneman and Tversky, 1982) biases, predicts under- or over-reaction to news depending on the stream of past news. The model of Daniel, Hirshleifer and Subrahmanyam (1998), which relies on the biases of overconfidence and biased self-attribution, predicts over-reaction to private information and under-reaction to public information. The model of Hong and Stein (1999), which classifies traders into two classes, one of which ignores the news but reacts to price movements, predicts an under-reaction to news and an over-reaction to non-information-based price movements. The model of Grinblatt and Han (2005), which relies on the disposition to sell winners too early and ride losses too long (Shefrin and Statman, 1985; Kahneman and Tversky, 1979, 1982; Thaler, 1985, 1999), predicts under-reaction to information.

³ Benartzi, Michaely and Thaler (1997) find that firms that increase their dividend payment experience a significant three-year (buy-and-hold) positive excess return of 8.01 percent (computed using size matched portfolios) in a sample of 4,249 cases from the 1979-1991 period. However, they note that the sample quintile announcing the largest dividend increases (774 observations) earns only 5.1 percent excess return (cumulative) over the three years, which is not significant statistically. Also, they do not examine the robustness of their results across sampling

periods, firm sizes, and different methods for measuring the abnormal stock return. Therefore, they have no robust evidence of under-reaction.

⁴ Grullon and Michaely (2004) find a significant under-reaction in a sample of 4,443 open-market share repurchase announcements from the 1980 to 1997 period.

⁵ The only study we found is the one of Lie (2000) which looks at this issue very briefly. Using a sample of 570 special dividends from the 1978-1993 period, Lie (2000) reports that the three-year (buy-and-hold) post-announcement abnormal stock return (computed using size and book-to-market ratio matched firms) is 6.5 percent, which is statistically insignificant. He does not use any other matching criteria or procedure for computing the long-term abnormal return.

⁶ The studies of Healy and Palepu (1988), DeAngelo, DeAngelo, and Skinner (1992), Jensen and Johnson (1995), and Benartzi, Michaely, and Thaler (1997) indicate a consensus about a very strong correlation between dividend changes and changes in earnings performance in the year preceding and the year of the dividend change. However, the evidence on the relation between dividend changes and future earnings changes is not conclusive. DeAngelo, DeAngelo, and Skinner (1992) examine a sample of firms that had an annual loss following an established track record of positive earnings and dividend payments and report that dividend-reducers typically experience greater future earnings problems than do non-reducers. However, DeAngelo, DeAngelo, and Skinner (1996) find that firms that increase their dividends despite suffering a decline in their annual earnings following a consistent earnings growth over at least 10 years show neither signs of systematically positive future earnings surprises nor greater abnormal future earnings performance relative to a comparable group of no-dividend-increase firms. Similarly, Benartzi, Michaely, and Thaler (1997) report that there is not much evidence of a positive relation between dividend changes and future earnings changes in samples of dividend increases, no-changes, and decreases. Therefore, the evidence on the relation between dividend changes and future earnings changes is inconclusive.

⁷ Interestingly, Lie (2000) provides evidence that “special dividends generally constitute much larger incremental disbursements than do increases in dividends, not considering the effect of special dividends and regular dividend increases on future dividends.” (page 225)

⁸ Brickley (1983), Howe, He and Kao (1992) and Lie (2000) report an announcement-period average abnormal return of 2.1 percent, 3.4 percent and 3.5 percent, respectively.

⁹ Mitchell and Stafford (2000) point out three major weaknesses to using buy-and-hold abnormal returns: 1) they are particularly vulnerable to the problem of cross-sectional dependence among event firms (because of calendar time clustering for example, i.e., cross-sectional dependence of event-firms' abnormal returns that are overlapping in calendar time), which results in *t*-statistics that are overstated; 2) their distribution is skewed, which results in misspecified test statistics (but can be corrected by a bootstrapping method); and 3) they exacerbate the misspecified model problem, specifically since the true asset pricing model is not known, any potential spurious abnormal return occurring at the beginning of the post-event period would be compounded by the buy-and-hold measure, leading to significant biases over longer horizons. On this last point, Fama (1998) argues that bad-model problems are most acute with long-term buy-and-hold abnormal returns. Mitchell and Stafford (2000) explain that many of the poor statistical properties of individual-firm buy-and-hold abnormal returns can be mitigated with large sample sizes and careful construction of benchmark portfolios. However, the statistical problems arising from the cross-sectional dependence problem of the BHAR cannot easily be corrected and are increasing in sample size. The rolling portfolio method controls for the problem of cross-sectional dependence among event firms.

¹⁰ Baker and Wurgler (2004) find support for their “catering theory.” They report that the propensity to pay dividends increases when a proxy for the stock market dividend premium is positive and decreases when it is negative.

¹¹ Bernheim and Wantz (1995) compare the dividend increase announcement effects under different tax regimes and find that there is a strong positive relation between dividend tax rates and the bang-for-the-buck.

¹² Clearly, since the sample firms are already split into size quintiles, one would not expect a real difference between the results of equal- and value-weighting.

¹³ We compute the market capitalization of each firm on CRSP as of the end of 2001, then we classify all these firms into size quintiles in descending order, and we find that the five quintiles represent, respectively, 77.95 percent, 13.8 percent, 6.14 percent, 1.78 percent and 0.32 percent of the total market capitalization of all firms on CRSP as of end of 2001.