

The cash-flow permanence and information content of dividend increases versus repurchases

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Abstract:

We hypothesize that firms choose dividend increases to distribute relatively permanent cash-flow shocks and repurchases to distribute more transient shocks. As predicted, we find that post-shock cash flows of dividend increasing firms exhibit less reversion to pre-shock levels compared with repurchasing firms. We also examine whether the stock market uses the announcement of the payout method to update its beliefs about the permanence of cash-flow shocks. Controlling for payout size and the market's expectation about the permanence of the cash-flow shock, the stock price reaction to dividend increases is more positive than the reaction to repurchases.

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1. Introduction

Corporations use dividends and share repurchases as the two main methods to distribute cash to shareholders. While each method has received considerable attention in the academic literature, fewer studies examine the choice between repurchases and dividends. In particular, we do not know what factors drive the choice between dividends and repurchases and what, if any, information investors infer from this managerial choice.

We hypothesize that firms choose between repurchases and dividends to distribute cash-flow shocks based, in part, on the permanence of the shocks. Because dividend increases are implicitly permanent commitments, we predict that repurchases disburse temporary cash-flow shocks while dividend changes disburse relatively more permanent shocks. Further, under the hypothesis that management's choice of payout method is driven by its expectations about cash-flow permanence, announcements of dividend increases and repurchases will convey different information to investors. Thus, we test a second, related hypothesis: When stock prices do not fully anticipate the permanence of the cash-flow shock, the market uses the firm's choice of payout method to update its estimate of that permanence. All else equal, a dividend increase will convey more favorable information about the permanence of the cash-flow shock than will a repurchase. Thus, our second hypothesis is a prediction about the information conveyed by the method used to make the distribution, as opposed to the information contained in the amount or occurrence of the distribution.

We find, on average, that cash-flow shocks preceding substantial dividend increases are significantly more permanent than cash-flow shocks preceding repurchases. We define permanence as cash flows in the period following the payout decision relative to cash flows preceding the decision. Compared with control firms that do not change their cash

distributions, dividend-increasing firms exhibit significantly more permanent cash-flow shocks. In contrast, repurchasing firms' cash-flow shocks are no more permanent than those of nondistributing firms. Further, we find that, on average, the market correctly assesses that the cash flows of firms that subsequently increase their dividends are more permanent than those of control firms that do not increase their payout. The market-adjusted stock return over the two-year period preceding dividend increases is significantly greater than the return for control firms matched on cash flows and industry. In contrast, the returns of firms that subsequently initiate repurchases are no different from the returns of control firms.

We find that the stock market assesses the permanence of an individual firm's cash flows with error and uses the method of payout to update its assessment of the permanence of previous cash-flow shocks. When the market has identified a cash-flow shock as transient and management chooses to increase dividends, we expect the stock price reaction to the announcement to include an upward reassessment of cash-flow permanence. Similarly, when a repurchase is used to distribute a shock that the market believed to be relatively permanent, a downward reassessment of cash-flow permanence is expected to be part of the stock price reaction. Consistent with these predictions, we find that, controlling for the size of the payout and the market's prior assessment of the permanence of the cash-flow shock, stock price reactions to announcements of dividend increases are greater than the reactions to repurchases and are increasing in our proxy for the degree of transience the market assigned to the cash-flow shocks.

In the next section, we review the relevant literature and develop our hypotheses. We describe the data and sample selection in Section 3. The cash-flow permanence of dividend increasers, repurchasers, and control firms is compared in Section 4. In Section 5, we explore

the information content of dividend-increase and repurchase announcements. We relate our results to prior literature in Section 6 and conclude in Section 7.

2. Motivation and hypothesis development

In the first part of this section, we review the extant literature and place our hypothesis in context. In the second part, we develop a simple expository model to explain our hypothesis and frame the discussion for the remainder of the paper.

2.1. Motivation

This study compares the two main methods of cash payouts: dividend increases and share repurchases. Extensive literatures have focused on each method in isolation. Researchers find clear evidence that the announcement of either method conveys positive information about the value of the firm. Pettit (1972) and Aharony and Swary (1980) document positive stock price reactions to dividend increase announcements. Dann (1981) concludes that the positive stock price reaction to repurchase announcements is the result of information signaling. Analysts react consistently with the market. Ofer and Siegel (1987), Denis, Denis, and Sarin (1994), and Carroll (1995) provide evidence that dividend changes cause analysts to change their earnings forecasts. Dann, Masulis, and Mayers (1991) show that analyst forecast revisions and earnings surprises follow repurchase tender offer announcements and that these surprises are related to the stock price reaction to repurchases. However, less success has been achieved in tying the information content of payout announcements to an observable improvement in future cash flows or earnings. An early study by Watts (1973) examines dividend announcements and finds that the information content in dividends about future earnings is trivial. Subsequent studies use larger samples and different techniques, but they produce similar results. Little consistent evidence exists that

dividends have incremental information relative to contemporaneous earnings in predicting future earnings (Leftwich and Zmijewski; 1994, DeAngelo, DeAngelo and Skinner, 1996; Benartzi, Michaely, and Thaler, 1997). Bartov (1991) finds only what he terms “weak” evidence that positive earnings surprises occur in the same year as an open-market repurchase.

Recent empirical evidence continues to question the roles of dividends and repurchases as signals of higher future cash flows. Benartzi, Michaely, and Thaler (1997) study a comprehensive sample of dividend changes and find that if dividend increases signal anything about future earnings, it is that earnings are less likely to fall than for similar firms without dividend increases. They conclude that dividends are a reaction to past and contemporaneous earnings changes instead of a signal of higher future earnings. Similarly, Lie and McConnell (1998) find little evidence that repurchase tender offers precede higher future performance. Rather, they show that the return on assets observed prior to the repurchase is less likely to fall in the future. One explanation of these findings, tested here, is that different payout choices signal varying degrees cash-flow shock permanence, not greater future performance.

The small body of research that jointly examines dividends and repurchases focuses either on their relative efficacy as signals of future performance or on their relative efficiency for distributing cash. Talmor and Titman (1986) and Bagwell and Shoven (1988) contrast the two methods on tax effects while Barclay and Smith (1988) highlight differing transaction costs. Ofer and Thakor (1987) demonstrate theoretically that repurchase tender offers should be used to correct large misvaluations while dividends are more efficient for smaller misvaluations. Choi and Chen (1997) find empirical support for the predictions of Ofer and

Thakor (1987) by documenting that the stock price reaction is larger for a repurchase tender offer announcement than for a dividend change, even after controlling for the size of the distribution. A recent paper by Bartov, Krinsky and Lee (1998) examines a sample of 260 firms, half of which repurchase shares and half of which pay dividends. The authors hypothesize that managers choose a repurchase over a dividend if management views its shares as greatly undervalued, management has stock options that are not dividend-protected, or a large fraction of equity ownership is held by institutions (which seem to show a preference for repurchases). Their evidence generally supports their predictions. Fenn and Liang (1998) also recognize that dividends reduce executive stock option values while repurchases do not. Denis (1990) and Bagwell (1992) identify takeover defense as an alternative motivation for repurchases. While we agree that these factors influence the distribution decision, we view our paper as complementary in that we focus on a fundamental determinant of the decision—the permanence of the underlying cash flows. Contemporaneous and independent work by Jagannathan, Stephens and Weisbach (1999) also focuses on cash-flow variation as a determinant of payout method. We relate our results to theirs in Section 6.

2.2. Hypothesis development

We hypothesize that firms use both dividend increases and share repurchases to distribute past and contemporaneous cash-flow shocks. This view is broadly consistent with the evidence in Bartov (1991) and Benartzi, Michaely, and Thaler (1997). We argue that the choice between these two payout methods depends partly upon the expected permanence of the realized cash-flow shock. Lintner (1956), Fama and Babiak (1968), and Asquith and Mullins (1983), among others, provide evidence that dividend increases are intended to be and are, on average, permanent. Share repurchases, by comparison, are generally stand-alone

actions that are taken each time shares are acquired (though they may be part of a pattern of planned repurchases).¹ Further, Stephens and Weisbach (1998) document that not all announced repurchase programs are completed and that the average completion rate is approximately 80% of announced shares. This suggests that if managers are unsure about the permanence or size of the contemporaneous cash-flow shock, they may choose a repurchase over a dividend increase to allow them flexibility in abandoning the planned distribution. Therefore, because a dividend increase is implicitly more permanent, we hypothesize that dividend increases follow cash-flow shocks that are more permanent than those followed by repurchases.

When the market does not perfectly anticipate the permanence of a cash-flow shock, the hypothesized relation between the method of payout and the permanence of future cash flows has implications for the information content of dividend increases relative to repurchases. If, as we predict, firms use dividend changes to adjust cash payouts when cash-flow changes are relatively more permanent, an increase in the dividend provides the market with favorable information about the extent to which past and contemporaneous cash flows are likely to continue. However, when a firm uses a share repurchase instead of a dividend increase, the market, on average, receives less favorable information about the permanence of a cash-flow shock. The magnitude of the price reaction depends upon the extent to which a payout announcement causes the market to change its expectations about the permanence of a firm's cash flows. As such, it is important to consider the information content of the payout choice *conditional* on the market's expectations about cash-flow permanence.

¹ In a comprehensive study of actual share acquisitions in open-market repurchase programs in the 1980s, Stephens and Weisbach (1998) find that only 10% of the sample firms have more than one repurchase in any three-year period.

A simple model aids the exposition of our predictions. Assume that a firm's cash-flow shocks either immediately dissipate or are completely permanent. The firm receives a positive cash-flow shock during period 1. Its cash flows in period 1 are its normal level of cash flows (CF) plus the shock (Shock): $CF+Shock$. In the future, the firm's cash flows will be $CF+pShock$, where p is the permanence parameter, taking the value of either zero or one. The firm exists for two periods and makes a distribution announcement at the beginning of period 2. Because this model is purely expository, and because our predictions are demonstrated most clearly in this simple setting, we will abstract from the possibility that the firm retains the cash-flow shock instead of distributing it. Later, we will consider how this restriction affects the predictions.

Assuming a discount rate of zero without loss of generality, the price of the firm in period 1 when the shock is observed will be P_1 , where $P_1 = (CF+Shock)+[CF+\Pr(p=1 | \gamma)Shock]$. The managers observe the permanence parameter, p , but the market does not. Therefore, the market must assess the probability that the permanence parameter equals one based on its information at the time of the shock, represented by γ . The managers then make a distribution announcement. If the shock is permanent, they choose a dividend; if the shock is temporary, they choose a repurchase.² The market observes the choice of distribution method and updates its belief about the permanence of the shock. Thus, the firm's price after the distribution announcement is P_2 , where $P_2 = 2(CF+Shock)$ if a dividend is announced, and $P_2 = (CF+Shock)+CF$ if a repurchase is announced.

² While our model is intended only to ease the exposition of the paper, the payout choice by managers can be made to be a separating equilibrium by continuing the life of the firm past two periods and making it prohibitively costly for managers of firms with temporary shocks to continue paying higher dividends past

The change in price resulting from the announcement of the distribution is decreasing in $\Pr(p = 1 | \gamma)$. If the managers announce a dividend increase, then $\Pr(p=1)$ goes to one, and the increase in price is a decreasing function of the probability the market placed on observing a dividend increase. If the managers announce a repurchase, then $\Pr(p=1)$ goes to zero. In this case, the price will fall, unless $\Pr(p = 1 | \gamma) = 0$, meaning the market completely anticipated the repurchase. As the market puts more weight on the possibility that the distribution will be a dividend increase, the price change upon announcement of a repurchase decreases. Thus, for both types of distribution announcements, the announcement return, conditional on the chosen method, is decreasing in the prior weight put on p being equal to one.

One aspect of the above model that requires clarification is the prediction that the market responds negatively to share repurchases. This prediction, which is not empirically descriptive, stems from the simplifying assumption that only two types of firms exist: dividend increasers and repurchasers. When the model is expanded to allow for firms that make no cash payout, this counterintuitive prediction is eliminated. To see this, reconsider the model with the following change: At the time of the payout decision, with some small probability, the manager receives a negative signal about period 2 cash flows (CF) and, instead of distributing the shock, can choose to retain it to cover the expected cash shortfall. In this case, both dividend increases and repurchases will produce positive stock price reactions, though the size of the reactions continues to be decreasing in the market's prior assessment of the permanence of the period 1 cash-flow shock.

period 2. For example, the separation can be achieved if we assume costly external financing and a penalty for omitting a dividend in period 3.

To summarize, the two predictions of the *permanence hypothesis* are: 1) the cash-flow shock preceding a dividend increase will have a larger permanent component than a cash-flow shock preceding a repurchase, and 2) the market will use management's choice of payout method to update its belief about the permanent component of the cash-flow shock.

3. Data

We identify a sample of firms that declare either regular, quarterly dividend increases or open-market repurchase authorizations.³ Working from the distribution decision date during a fiscal year t , we compute baseline cash flows over years $t-4$ through $t-2$, the cash-flow shock during years $t-1$ and t , and future cash flows from years $t+1$ through $t+3$. Using these cash-flow measures, we compare the permanence of cash flows between the two types of firms.⁴

We begin with a sample of open-market repurchase authorization announcements from 1981 to 1993. These data are gathered from the Securities Data Company database of repurchases. If a firm announces two repurchases within one fiscal year, we eliminate the second one. These second repurchases could be reauthorizations of the previously announced programs. To this repurchase sample, we add all regular, quarterly dividend increases made

³ We consider self-tender repurchases in our sensitivity analysis at the end of Section 5. We exclude self-tenders from the main sample because we believe that these repurchases reflect a substantially different event than open-market repurchases. Self-tenders normally involve at least twice the proportion of shares that open-market programs do and result in a significant change in the ownership concentration in the firm. Further, other studies find that many self-tender offers are initiated in anticipation of, or in competition with, an outside takeover offer (Dann and DeAngelo, 1988; Denis, 1990).

⁴ An alternative approach is to start with a sample of firms that experience large cash-flow shocks and then track payout decisions. We feel that this alternative approach is better suited to addressing a different question--why some firms distribute cash-flow shocks and others do not. Because we explore how firms choose between alternative payout methods, our approach offers two advantages: First, we do not force the sample firms to have a cash-flow shock of some arbitrary magnitude; second, our design identifies all firms that increase dividends or announce repurchases. This second point is important because it allows us to begin with a complete sample of firms making these distribution changes.

by firms in the Center for Research in Security Prices (CRSP) database over the same 13-year time period. A dividend increase is included only when other quarterly dividend changes within the fiscal year are either positive or zero; that is, when both negative and positive quarterly changes occur within the same fiscal period, the observation is excluded. The resulting data set contains 1,068 repurchases and 5,007 dividend changes.⁵ Table 1 presents the distribution of the events across time. While the use of repurchases increased over our sample period, the incidence of dividend increases has remained relatively stable. The robustness of our results to subperiod analysis is discussed in Section 5.

We divide the dividend increase sample into two subgroups termed substantial dividend increases and small/routine dividend increases. The substantial dividend group contains increases that are not preceded by a dividend increase in the previous year or are larger than the dividend increase in the previous year (dividend increases are measured as the dollar change in the quarterly dividends over the entire year scaled by total assets at the beginning of the year). The small/routine group has all remaining increases. We expect that small/routine dividend increases carry significantly less information about cash-flow permanence than a more substantial increase, because these changes are less likely to be viewed as the primary payout decision in the two-year shock window. This subdivision results in 2,961 substantial dividend increases and 2,046 small/routine increases.⁶

⁵ There are 111 firms that announce both a dividend increase and a repurchase within the same month. Our hypotheses suggest that the cash-flow shocks experienced by these firms are likely to be partially permanent and partially transitory. For parsimony, we do not treat these firms as a separate sample. Because our tests examine differences in cash-flow permanence between samples, the decision to include these firms should bias against finding the results we document. We also note that excluding these firms, or firms that use one payout method in year t and a different method in year $t+1$, from the sample does not affect our inferences.

⁶ Some firms announce substantial dividend increases two years in a row. Because our research design examines firms' cash-flow patterns over multiple years, these overlapping observations can bias our test statistics. To explore this possibility, we remove the second occurrence in each set of overlapping observations and repeat the tests. Our results are qualitatively unchanged.

4. The cash-flow permanence of dividend increasers versus repurchasers

In this section, we test our primary hypothesis that the distribution method is related to the permanence of previous and contemporaneous cash flows. Our findings support the hypothesis that the cash-flow shocks of firms that substantially increase dividends are significantly more permanent than the shocks of repurchasers or small/routine dividend increasers. The cash flows of substantial dividend increasers are also more permanent than the cash flows of control firms in the same industry with similar-sized shocks.

4.1. Summary statistics

Table 2 presents summary statistics for the samples of repurchasers and dividend increasers. While the repurchasers and substantial dividend increasers are similar in size, the small/routine dividend increasers are somewhat larger. The median market value of equity is \$470 million for repurchasers, \$440 million for substantial dividend increasers, and \$656 million for small/routine dividend increasers. The relatively bigger size of the routine dividend increasers is consistent with the notion that, on average, larger, more mature firms use dividends more regularly. Although the market-to-book ratios differ statistically between substantial dividend increasers and repurchasers, the mean and median values for the repurchasers are within 10% of the respective mean and median values for both samples of dividend increasers. The leverage ratios indicate that dividend increasers tend to be more levered than their repurchasing counterparts.

Table 2 also contains information on the size of the cash distributions. To compare the cash payouts across the dividend increase and repurchase samples, we produce a payout measure that characterizes dividend increases as perpetuities. We estimate the present value of the cash paid out via a dividend increase as the annualized increase in dividends divided by

a discount rate of 10%.⁷ We then scale this measure by the firm's share price five days prior to the dividend increase announcement. The mean present value of the expected dividend payout is 4.6% of market value for substantial dividend increasers and 2.8% for small/routine dividend increasers. As a percentage increase from the previous dividend level, the median dividend increase is 13.2% for substantial increasers and 8.6% for small/routine increasers (not tabulated). For the 676 repurchasing firms with available data, the mean percentage of outstanding shares sought is 7.7%. Thus, repurchases are larger than dividend increases, on average, even if the dividend increase is assumed to be permanent.

4.2. The size and permanence of the cash-flow shock

Consistent with previous studies (e.g., Dechow, 1994), cash flow from operations is computed as:

$$\text{CFO}_t = \text{Operating income before depreciation}_t - \text{Interest}_t - \text{Taxes}_t - \Delta \text{Working capital}_t$$

We scale cash flow from operations by beginning-of-period assets to reduce heteroskedasticity and spurious correlations stemming from firm size.

Table 3 indicates that the size and permanence of the cash-flow shocks experienced by the sample firms are broadly consistent with our predictions. The timing and definition of these measures are illustrated in Figure 1. Year 0 is the fiscal year in which the dividend is increased or the share repurchase is authorized. We measure the cash-flow shock by

⁷ Alternatively, we could estimate a separate required return on equity for each firm. However, the measurement error introduced by estimating a beta for each firm and a risk-free rate and expected return on the market for each date is potentially as large, if not larger, than the error introduced by using a constant discount rate. Following a similar logic, Jensen (1993) uniformly applies a discount rate of 10% to all firms in computing performance measures. The perpetuity assumption is based on managers' reluctance to reduce dividends. To the extent that this assumption is incorrect, we overestimate the size of the payout for dividend increasers, which biases against our later finding that dividend increases receive a larger stock price reaction than repurchases, controlling for payout size.

comparing the average cash flow in years -1 and 0 with the average cash flow in years -4, -3 and -2. The raw cash-flow shock is reported in Panel A and is defined as:

$$[\text{Avg (Cash flow/Total Assets) in years -1 and 0}] -$$

$$[\text{Avg (Cash flow/Total Assets) in years -4 to -2}]$$

Because firms differ in their normal cash flow-to-asset ratios, we also report the percentage change in the cash flow-to-assets ratios in Panel B as an alternative measure of the cash-flow shock. We compute the percentage change measure by scaling the raw change in cash flows defined above by the average cash flow-to-assets in years -4 to -2. We remove from the sample the most extreme 1% of the observations for each of our shock and permanence measures, as well as observations with negative denominators.⁸ We report only median values of our cash-flow measures for parsimony and because the distributions tend to be skewed.⁹

The median raw cash-flow shock experienced by repurchasers is 0.005 compared with a somewhat larger shock of 0.007 for substantial dividend increasers. The median shock as a percentage of average pre-shock cash flows is 4.2% for repurchasers and 6.4% for substantial dividend increasers. Small/routine dividend increasers have a median raw cash-flow shock of 0.000, considerably smaller than for either of the other two samples. Thus, the two dividend

⁸ Approximately three hundred observations are removed because of negative average cash flows in the denominator of the percentage change measures. The median cash-flow shock for the removed firms is negative compared with a significantly positive median cash-flow shock for the remaining sample firms. Further, these contrasting median shocks persist when the negative cash-flow firms are partitioned based on payout type. These differences suggest that negative cash-flow observations reflect a substantially different economic event than our treatment firms.

⁹ The analysis is robust to using the means of the raw changes. For the percentage changes, the distributions are substantially more skewed, and while the differences have the same sign, the significance levels are reduced.

subsamples appear to make their payout choices in response to substantially different cash-flow patterns.

Table 3 also includes two measures of the permanence of the cash-flow shock. The first is termed reversion and is defined as:

$$\begin{aligned} & [\text{Avg (Cash flow/Total Assets) in years +1 to +3}] - \\ & [\text{Avg (Cash flow/Total Assets) in years -1 and 0}] \end{aligned}$$

Reversion captures the extent to which future cash flows remain at the level of cash flows during the shock period. We argue that managers who react to a cash-flow shock by increasing dividends expect some portion of that shock to be permanent. Further, the proportion of the shock that is permanent for substantial dividend-increasing firms should be greater than the proportion for either repurchasing firms or small/routine dividend increasers. Consistent with our measurement of the cash-flow shock, we also provide results for a percentage change measure of reversion that scales the raw reversion measure above by average cash flows in years -1 and 0.

Our second measure of the permanence of the shock, termed permanence, differs from the first by its comparison period:

$$\begin{aligned} & [\text{Avg (Cash flow/Total Assets) in years +1 to +3}] - \\ & [\text{Avg (Cash flow/Total Assets) in years -4 to -2}] \end{aligned}$$

This measure is designed to capture the degree to which future cash flows settle above or below their pre-shock level. We predict that firms with substantial dividend increases expect their cash flows to settle above prior levels to a greater extent than repurchasing firms' cash

flows. We also report results for a percentage change measure of permanence, which scales the raw permanence measure by average cash flows in years -4 to -2.

The results in Panels A and B of Table 3 are consistent with our hypotheses. The reversion measures indicate that shocks followed by substantial dividend changes are more permanent than those followed by repurchases. The median raw reversion measures indicate that cash flows of substantial dividend increasers drop by 0.6 percent of assets after the change in payout, while those of repurchasers drop by 0.9 percent of assets.¹⁰ The permanence measures, which reflect persistence of cash flows above pre-shock levels, show that future cash flows of the median substantial dividend increaser are slightly above the pre-shock level. In contrast, repurchasing firms show a significant reduction in cash flows. The percentage change permanence measure in Panel B reveals that repurchaser cash flows are approximately 91% of pre-shock levels while dividend-increasing firms have cash-flow levels approximately 102% of pre-shock levels. Both percentages are significantly different from 100% of pre-shock levels.

While the reversion measures are similar for the substantial and small/routine dividend increasers, the permanence measures are markedly different between these samples because of the considerably larger cash-flow shocks experienced by the substantial increasers. In contrast to the marginally positive permanence measures of substantial dividend increasers, small/routine dividend increasers, like the repurchasers, experience a significant drop in future

¹⁰ The fact that the average reversion of the entire sample is negative is not surprising. Dechow, Kothari, and Watts (1998) model the time-series properties of operating cash flows and the accounting process that incorporates expected future cash flows in earnings. They show that when demand for a firm's products varies over time, differences in the timing of cash outlays and inflows leads to negative serial correlation in cash-flow changes. For example, a firm that experiences a positive shock in product demand is likely to make cash outlays in the current period for inventories and accounts payable but not fully receive the cash inflows until some future period when sales are made and accounts receivable are collected. They also provide empirical support for their predictions by finding a significant negative serial correlation of -0.28 between cash-flow changes.

cash flows to levels that are approximately 93% of pre-shock cash flows. This difference between the dividend groups is statistically significant at the 1% level. These results highlight the importance of the earlier supposition that not all dividend increases convey similar information about the permanence of the firm's cash flows.

As a robustness check, we constrain the repurchase sample to contain only the 697 firms that also pay dividends. One could argue that these firms legitimately had both methods of cash distribution available to them: an increase in their dividend or a repurchase. Firms without an established dividend would have to initiate a dividend as an alternative to a repurchase--an event that is likely to differ substantially from an increase in the regular dividend.¹¹ Using this restricted sample does not change the inferences from Table 3. We discuss the robustness of our results using the restricted sample throughout the remainder of the analysis and, where appropriate, present tabulated results based on that sample.

The evidence in this section is consistent with the hypothesis that, relative to substantial dividend increases, repurchases are used to distribute more transient shocks. However, these findings could be influenced by firm-specific or industry-specific characteristics of the sample firms. To explore this issue further, we report reversion and permanence measures for a sample of control firms that did not increase dividends or initiate repurchases. The initial pool of firms for the control sample consists of all firms with sufficient data available on CRSP and Compustat to compute our measures of cash-flow shock, reversion, and permanence. From this group, we remove all firm-year observations that overlap with our initial sample of repurchasers and dividend increasers. We create 20

¹¹ Though we do not explicitly explore the cash-flow permanence of dividend-initiating firms, we identify a sample of 97 firms that begin paying dividends between 1981 and 1993 and meet our data requirements for computing the reversion and permanence statistics. Consistent with firms initiating dividends only when cash-

equal-sized control portfolios based on the size of the cash-flow shock and match each of our repurchase/dividend change sample firms to a portfolio based on the ranking of their cash-flow shocks. To control for industry-specific differences in reversion and permanence, we also restrict each control portfolio to contain only firms with the same two-digit Standard Industrial Classification (SIC) code as the sample firm.¹²

Table 4 reports the median reversion and permanence measures for both the sample firms and the matching firms. It also presents the median difference between the sample and matching firms for these measures and tests for the significance of the differences. The matching firms exhibit substantially more negative reversion and less permanence than the substantial dividend-increasing firms. This finding holds for both the raw differences and percentage changes in cash flow-to-assets. In contrast, the repurchasers and small/routine dividend increasers have reversion and permanence measures that are similar to those of the matching firms.

Finally, Table 4 includes two-year market-adjusted buy-and-hold stock returns measured over the cash-flow shock period. Given that returns anticipate future cash flows, we expect that, controlling for industry and the size of the cash-flow shock, the stock returns contemporaneous with the cash-flow shock are higher for firms that subsequently increase their dividends than for control firms or firms that repurchase shares. The median return for the repurchasing firms is marginally positive, at 2%, but not significantly different from the returns of their matching firms. This is consistent with our finding that repurchasers' cash-flow shocks revert quickly and their cash flows are no more permanent than those of the

flow shocks are expected to be highly persistent, the median permanence measure for dividend-initiating firms is very large, with future cash flows remaining at 106% of pre-shock cash flows.

control firms. In contrast, the median market-adjusted return for firms in the substantial dividend-increase sample is a significantly positive 12% and substantially greater than the median return for the control firms. The returns of the small/routine dividend-increase sample are similar to those of the substantial dividend increasers, but less pronounced. Thus, our results indicate that for dividend-increasing firms, but not for repurchasers, the market anticipates future cash flows that are higher than those of their control sample counterparts.

To summarize, we establish that cash-flow shocks experienced by firms that make substantial dividend increases are more permanent and revert less than those experienced by firms making repurchases or small/routine dividend increases and an industry-and-cash-flow-shock-matched control sample. Further, consistent with the market accurately anticipating cash-flow permanence on average, dividend increasers' stock returns over the cash-flow shock period are greater than those of firms from the same industry with similar cash-flow shocks, but that do not increase their payouts.

5. The Information content of the method of payout

In this section, we examine the stock price reaction to announcements of dividend increases and repurchases to test our secondary hypothesis that the market uses the payout announcement to update its estimate of the permanence of the cash-flow shock. If management's choice of payout method is driven by its expectations about cash-flow permanence, announcements of dividend increases and repurchases are predicted to convey different information to investors. Figure 2 illustrates an information timeline useful in understanding our regression tests.

¹² We have repeated the matching procedure using size of cash-flow shock and firm size as the matching criteria. The results are qualitatively unchanged.

5.1. Development of the tests

To investigate whether the market updates its assessment of cash-flow permanence based on the type of payout announcement, we require an estimate, for each firm, of the market's expectation of the permanence of the cash-flow shock (analogous to γ in our stylized model of Section 2). To produce this estimate, we regress each firm's market-adjusted buy-and-hold return over the eight quarters leading-up to the payout announcement on its cash flows over the same period:

$$8\text{quarterReturn}_i = a + b(8\text{quarterCashFlows}_i) + e \quad (1)$$

The residuals from this regression represent adjusted returns. If a firm's residual is positive, then its return is higher than average after controlling for the level of cash flows, and we view the market as expecting the firm's cash-flow shock to be relatively permanent. Similarly, if the adjusted return is negative, we view the market as expecting the cash-flow shock to be relatively transient.

We can now specify, in terms of the adjusted returns, our empirical predictions about the relation between the payout method, market expectations about cash-flow permanence, and payout announcement returns. The market forecasts cash-flow permanence with error. Because our evidence indicates that the choice of payout method is associated with cash-flow permanence, we expect that the market will update its expectations about permanence based on the payout method that the firm announces. If the adjusted stock return in the period preceding the payout announcement is high, and the firm chooses a repurchase to distribute cash flows, we predict that the stock price reaction to the announcement will be smaller than average. This is because part of the market's reaction will reflect a downward adjustment of its expectation of cash-flow permanence. In terms of the model from Section 2, this is a case

where market participants assigned too high a probability to the greater permanence; that is, $\Pr(p = 1 | \gamma)$ is too high. Similarly, if the adjusted return is low, and the firm chooses a dividend increase to distribute cash flows, we predict that the market will react more positively than average as it adjusts upward its expectation of cash-flow permanence. This is a case where market participants assigned too low a probability to the greater permanence; that is, $\Pr(p = 1 | \gamma)$ is too low.

Thus, the *permanence hypothesis* predicts a negative relation between the adjusted return and the stock price reaction to the payout decision. Specifically, conditional on a firm choosing a dividend increase, thereby sending a strong signal about cash-flow permanence, the announcement return is predicted to be a decreasing function of the cash-flow permanence expected by the market. Similarly, conditional on a firm choosing a repurchase, thereby sending a weak signal about cash-flow permanence, the announcement return is predicted to be a decreasing function of the cash-flow permanence expected by the market.

This argument implies that the expected negative relation between adjusted returns and announcement returns is concentrated in the negative adjusted returns for dividend-increasing firms and in the positive adjusted returns for the repurchasing firms. If the market expects a cash-flow shock to be transitory (a negative adjusted return), and the firm announces a dividend increase, prices are predicted to react positively. However, if the market expects a cash-flow shock to be permanent (a positive adjusted return), and the firm announces a dividend increase, prices are not predicted to react as substantially because the market correctly assessed the permanence of the cash-flow shock prior to the distribution announcement. Thus, we predict that, for substantial dividend increasers, the coefficient on negative adjusted returns in announcement return regressions is negative and the coefficient

on positive adjusted returns is less negative or zero. Because small/routine dividend increases are not expected to convey as much information as substantial increases, a less pronounced difference is expected between the coefficients on their positive and negative adjusted returns.

In the repurchasing sample, if the market expects a cash-flow shock to be transitory (a negative adjusted return), and the firm announces a repurchase, prices are not predicted to react substantially given that prices already reflect the transitory nature of the cash-flow shock. However, if the market expects the cash-flow shock to be permanent (a positive adjusted return), and the firm announces a repurchase, the announcement return, while still positive, should incorporate a negative component reflecting the new negative information about the permanence of the cash-flow shock. Thus, for repurchasing firms, we predict that the coefficient on positive adjusted returns is negative and the coefficient on negative adjusted returns is less negative or zero.

Figure 3 provides an illustration of our predictions and basic findings with respect to payout announcement returns. For both substantial dividend increasers and repurchasers, we report the payout announcement returns for both high and low expectations about future permanence (i.e., for adjusted returns $>$ and $<$ 0). As a control for the cash distribution size, we partition the announcement returns in each of these groups into “above the median” and “below the median” payout size subgroups using the measures described in Table 2. Consistent with the *permanence hypothesis*, the announcement return to dividend increases is greater than for share repurchases in each two-way comparison. Further, the announcement response to a dividend increase is greater when the market’s prior assessment of cash-flow permanence is low, and, when the payout is large, the announcement response to repurchases

is lower when the market's prior assessment of cash-flow permanence is high. However, these differences, based on such a coarse separation, are not all statistically significant.

A more powerful test of the *permanence hypothesis* is presented in Table 5, where we report announcement return regressions. In addition to our estimate of the market's cash-flow permanence forecast [the adjusted return from Eq. (1)], the regressions include indicator variables for repurchasers and substantial dividend increasers. We control for payout size using the measures defined in Table 2. We also control for other economic determinants of the stock price reaction to dividend and repurchase announcements using variables suggested by previous studies. Specifically, we include total assets, market value-to-book value of assets, the leverage ratio, and the ratio of cash to total assets. Because larger firms are expected to have less information asymmetry (e.g., Collins, Kothari, and Rayburn, 1987; Brennan and Hughes, 1991), the surprise component of their distribution announcement should be lower, leading to a smaller stock price reaction. We use the market-to-book ratio to control for the finding that the stock market reacts favorably to distributions of cash by firms with low growth opportunities (see Lang and Litzenberger, 1989; and Nohel and Tarhan, 1998). Jensen (1986) argues that agency theory predicts a positive reaction to decisions that increase previously low leverage. Finally, we include firms' cash reserves to control for the agency theoretic prediction that the stock price reaction to distributions by firms with large cash holdings will be positive, a finding supported by Lie (1998). In all regressions, the control variables obtain coefficients of the predicted sign and, with the exception of leverage, are significant in most of the specifications.

5.2. *Multivariate results*

Our findings are consistent with the hypothesis that part of the information in the payout announcement is the payout method, repurchase or dividend increase, and that investors use this information to update their beliefs about the permanence of past and current cash-flow shocks. Columns 1 and 2 present results for the full and restricted samples of dividend increasers and repurchasers. The restricted sample contains all dividend increasers, but only repurchasers that also pay dividends (see Section 4.2). In the full sample, the coefficient on the substantial dividend dummy is 1.04 and significantly positive, compared with an insignificantly negative coefficient of -0.75 for repurchasers. The univariate results reported in Table 2 confirm the finding in extant literature that the announcement return to repurchases is, on average, greater than that to a dividend increase. However, the multivariate results in Table 5 show that, controlling for the size of the payout and the market's expectation of the permanence of the cash-flow shock, the announcement return associated with a substantial dividend increase is greater than the response to a repurchase.

The coefficients on the adjusted returns variables indicate that the announcement returns to both dividend increases and repurchases depend upon the market's prior assessment of cash-flow shock permanence. In the full sample and restricted sample regressions, the coefficients on negative adjusted returns are significantly negative for substantial dividend increasers, indicating that the stock price reaction to a substantial dividend increase is larger if the market had assigned low permanence to the cash-flow shock. Similarly, the negative coefficient on the positive adjusted returns for repurchasing firms indicates that the stock price reaction to a repurchase is lower if the market assigned substantial permanence to the cash-flow shock. The generally smaller and insignificant coefficients on both positive adjusted returns for substantial dividend increasers and on negative adjusted returns for

repurchasers support the prediction that the announcement return is less pronounced when the market more accurately assesses the permanence of cash-flow shocks. The findings for small/routine dividend increases are similar to those for the substantial dividend increasers.

In Columns 3 and 4 of Table 5, we present announcement return specifications separately for dividend increasers and repurchasers. These specifications allow the coefficients on the control variables to vary across payout types. The inferences in these regressions are very similar to those for the full sample and restricted sample. Specifically, we find significantly negative coefficients only on negative adjusted returns for dividend increasers and on positive adjusted returns for repurchasers.

The announcement return regressions in Columns 1 to 4 of Table 5 are potentially influenced by a systematic mismeasurement of the payout size for repurchasers. Stephens and Weisbach (1998) show that firms repurchase, on average, only about 80% of the announced amount. If the market incorporates this fact into its reaction to the repurchase announcement, then *ceteris paribus*, the return response to a repurchase will be lower than to a dividend increase, after controlling for the *announced* size of the payout. To address this issue, we reestimate the announcement return specifications after redefining the size of the repurchase to be: (1) a flat 80% of the announced size; and (2) the actual percentage of shares repurchased in the two years following the announcement. To measure the actual shares repurchased, we follow the first method outlined in Stephens and Weisbach (1998), which uses changes in CRSP shares outstanding. Our results are unaffected by these adjustments to the announced size of the repurchase. Column 5 of Table 5 reports the results of the estimation using the actual shares repurchased. For parsimony, we do not tabulate the results using the flat 80% estimate, though the inferences are similar.

Overall, our evidence is consistent with the permanence hypothesis' prediction that the market updates its assessment of cash-flow permanence based on the announcement of the payout method. Because dividend increases are associated with more permanent cash flows than repurchases, dividends are a more favorable signal about future cash flows than repurchases. Table 5 shows that, controlling for the market's ex-ante assessment of cash-flow permanence, the size of the payout, and firm characteristics, the stock price reaction to a repurchase is smaller than to a dividend increase. Further, the reaction to a dividend increase is stronger, the lower the market's expectation of permanence prior to the announcement, and the reaction to a repurchase is lower, the higher the market's expectation of permanence prior to the announcement.

5.3. Robustness checks

We have noted throughout that our results are robust to the choices we have made in each test. We discuss further robustness checks here.

5.3.1. Characteristic differences between the payout samples

To this point, our inferences implicitly assume that the partitioning of firms based on payout choice is the primary driver of the observed differences in the reversion and permanence of the sample firms' cash flows. However, the summary statistics in Table 2 indicate that the repurchasing and dividend-increasing samples differ somewhat with respect to size, leverage, and the market-to-book ratio. While we have mitigated these differences when forming control samples in Table 4 and in the announcement return regressions in Table 5, these differences are not incorporated into our estimates of the market's assessment of cash-flow permanence prior to the payout announcement (the adjusted returns). Further,

several studies document variation in the return-earnings relation as a function of firm size, growth, and risk (e.g., Collins and Kothari, 1989; Freeman, 1987).

To address this issue, we allow the coefficient on cash flows in the regressions used to produce the adjusted returns [Equation (1)] to vary with size, leverage, and the market-to-book ratio. Although the coefficients on each of these additional interactive variables are significant, when the residuals from this augmented model are used in the announcement return regressions, the results are unchanged.

5.3.2. Subperiod analysis

Given the clear secular increase in repurchase use over our sample period, we conduct separate analyses for the subperiods 1981-87 and 1988-93. While the results for both subperiods are similar to those documented in the full sample, they are somewhat stronger in the 1988-93 subperiod. These findings are consistent with the payout method choice conveying stronger information once both methods are firmly established as accepted alternatives. We also examine the peak merger years (1987-89) separately. Because repurchases have been argued by Denis (1990) and Bagwell (1991) to be effective takeover defenses, the information conveyed by their announcement may have been different during these years. However, this possibility is mitigated somewhat by our concentration on open-market repurchases, which are expected to be a less effective takeover defense than repurchase tender offers. Our findings are robust to the merger-wave analysis.

5.3.3. Other distribution methods

While open-market repurchases and regular quarterly dividend increases are by far the most common methods used to distribute cash to shareholders, managers do have other

options available. In particular, we separately examine repurchase tender offers and specially designated dividends. Repurchase tender offers are similar to open-market repurchase programs in that they involve repurchasing shares and consist of a one-time commitment to distribute cash. However, repurchase tender offers are executed in the same way as interfirm tender offers. They remain open for a specified period of time (usually 20 trading days), offer a premium for the firm's stock, and handle oversubscription on a pro-rata basis. Further, they usually involve a much larger proportion of the shares and, at least for fixed-price offers, tend to be used by smaller, more closely held companies (see Comment and Jarrell, 1991).

In contrast to the implicit recurring commitment found in a regular quarterly dividend, specially designated dividends are similar to repurchase tender offers in that they involve a one-time commitment of cash. Brickley (1983) examines specially designated dividends and compares them with regular increases in dividends. His conclusions from the comparison of one-time and recurring dividends are consistent with our comparison of repurchases and dividend increases. Specifically, while he finds that both types of dividend changes are declared following good performance, earnings performance following regular dividend increases is significantly stronger than that following specially designated dividends.

We examine 102 repurchase tender offers and 90 specially designated dividends that match our sample period and meet our data requirements. We find that both types of payout exhibit much larger cash-flow shocks than our main sample of firms. However, the reversion of those shocks is very negative and the permanence is insignificantly different from zero. Thus, these firms appear to be characterized by large, dissipating shocks that have no discernible long-term effect on the magnitude of the underlying cash flows. The use of a one-time distribution instead of a recurring one is sensible for these firms given that their

permanence measure is roughly zero, on average. In comparison with our main samples, the permanence measure of zero puts them in between the -0.009 raw permanence measure for open-market repurchasers and the $+0.002$ raw permanence measure for substantial dividend increasers. We consider this to be consistent not only with the *permanence hypothesis*, but also with the extant empirical evidence indicating that repurchase tender offers are stronger signals than open-market repurchases (see Comment and Jarrell, 1991).

6. Discussion and relation to prior literature

It is useful to consider how our results complement previous research, because much of the extant work on the stock price reaction and information content of dividend announcements was performed before open-market repurchases became an accepted viable alternative payout method. Further, much of the work on repurchases explores their characteristics and meaning without directly comparing them with alternative payout methods such as dividends.

Previous studies of dividend announcements find that dividend increases produce upward revisions in analyst forecasts and yet do not precede either higher earnings or cash-flows. We describe a setting where these two empirical results can be observed simultaneously. We suggest that, prior to the payout announcement, analysts incorporate an expected degree of reversion and permanence into their forecasts of future cash-flows. The significantly greater returns during the cash-flow shock period for dividend increasing firms relative to control firms in Table 4 suggest that analysts' expectations of permanence are likely to be somewhat greater than that observed for the control firms. With the announcement of the dividend increase, analysts are expected to revise their forecasts upward, to account for the new information conveyed by the announcement about lower reversion and

greater permanence. In this setting, future cash flows are not expected to be higher than current cash flows, but they are expected to be higher than the forecast prior to the announcement.

The extant evidence on analyst revisions following open-market repurchases is not as strong as the evidence for dividend increases and is consistent with our finding that the cash flows of repurchasing firms behave similarly to the cash flows of control firms. Finally, our brief examination of repurchase tender offers in Section 5.3 provides a consistent interpretation of the evidence in both Dann, Masulis, and Mayers (1991) and Lie and McConnell (1998). Dann, Masulis, and Mayers find evidence of positive analyst revisions following repurchase tender offers, while Lie and McConnell find that slower mean reversion in return on assets is the only evidence of performance improvement following repurchase tender offers. Consistent with Lie and McConnell, we find that, compared with open-market repurchases, the cash-flow reversion for repurchase tender offers is less pronounced. Thus, our explanation for simultaneously observing positive analyst revisions and lower, but more slowly reverting, future performance following dividend increases also lends itself to our evidence on repurchase tender offers.

By tying payout choice to the permanence of cash-flow shocks, our study is related to, and consistent with, a growing stream of recent studies that suggest a relation between dividends and cash-flow variance as opposed to cash-flow levels. Decreases in earnings risk have been found in studies of dividend initiations such as Dyl and Weigand (1998), and increases in earnings risk have been found for omissions by Sant and Cowan (1994). Further, Bradley, Capozza, and Seguin (1998) present evidence consistent with the hypothesis that managers pay lower dividends when future cash flows are uncertain. Finally, Jagannathan,

Stephens, and Weisbach (1999) show that repurchasing firms have higher three-year cash-flow volatility prior to the distribution year. Their work provides further support for the permanence hypothesis given that, based on a different empirical approach, they conclude, as we do, that cash-flow variation and cash-flow stability are determinants of payout policy.

In a recent literature review, Allen and Michaely (1995) emphasize that one major criticism of many signaling models of dividend policy, such as Bhattacharya (1979) and Miller and Rock (1985), is that repurchases would be a more efficient signaling mechanism. This criticism is valid if the two methods are assumed to signal the same information, such as a high level of future earnings. In this study, we view the choice of dividend versus repurchase as primarily an operational one made to match the characteristics of the expected future cash flows. This relation between the permanence of the cash flows and the method of payout is the basis for part of the information content of payout announcements. We suggest that repurchases do not dominate dividends as signals because the two methods send fundamentally different signals. That is, because repurchases are not a more efficient method for signaling reversion or permanence of cash flows, both payout methods are observed.

7. Concluding discussion

We hypothesize that the method used to distribute cash flows reflects the nature of the underlying cash-flow process and shapes investors' expectations about the permanence of cash-flow shocks. The hypothesis has two parts. First, firms use repurchases to distribute cash-flow shocks that are primarily transient, and they use dividends for cash-flow shocks containing a larger permanent component. Second, the market recognizes this association and uses the announcement of a particular distribution method to update its belief about the permanence of past and contemporary cash-flow shocks.

We find that cash-flow shocks followed by substantial dividend increases have a larger permanent component than those followed either by repurchases or small/routine dividend increases or by no payout at all. This means that the cash flows of substantial dividend-increasing firms are less likely to revert back to levels prior to the cash-flow shock and, hence, are less transitory. Thus, the permanence of contemporaneous cash-flow shocks is related to the type of payout method chosen. Our announcement return analysis demonstrates that an important component to the information released by a distribution announcement is the *method* used to distribute the cash flows. We find that when the payout method does not match the market's expectations, the market updates its previous assessment of the permanence of the cash-flow shock. These findings indicate that the distribution method used by managers signals information about the permanence of the cash-flow shock.

While many factors contribute to a manager's decision regarding the appropriate method of payout to use for a given cash-flow shock, we argue that the shocks' permanence plays an important role in this choice. By focusing on the permanence of changes in cash flows instead of on their levels, our explanation can potentially reconcile evidence on favorable analyst reaction and little change in cash-flow levels following a payout announcement. Further, both payout methods are observed because repurchases provide valuable flexibility allowing managers to distribute transient cash flows without committing to an increase in a recurring dividend.

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Table 1

The distribution over the sample period (1981-93) of the sample firms increasing dividends or initiating an open-market repurchase. The repurchases come from all open-market repurchase announcements recorded in the Securities Data Company database. We eliminate all repurchases that are preceded by another one in the prior four quarters. These repurchases could be reauthorizations of the previously announced program. We use the Center for Research in Securities Prices database to identify all firms increasing their dividends over the sample period. A dividend increase is defined to occur when the current year's total quarterly dividend payout is greater than the previous year's quarterly dividend payout. Annual dividend increases are included only when each quarterly dividend change within a fiscal year is either positive or zero; that is, when both negative and positive quarterly changes occur within the same fiscal period, the observation is excluded.

Year	Repurchases	Dividend Increases
1981	4	446
1982	6	296
1983	30	291
1984	126	406
1985	41	389
1986	62	367
1987	158	398
1988	53	478
1989	156	469
1990	160	416
1991	65	357
1992	106	378
1993	101	316
Total	1,068	5,007

Table 2

Summary statistics on general characteristics of the sample firms, along with tests for differences between the subsamples. Repurchasers are compared with the two groups of dividend increasers: small/routine increases and substantial increases. A firm that has not had a dividend increase in the prior year or whose increase is larger than that from the previous year is included in the substantial increases group. All financial characteristics are computed at the end of the fiscal year prior to the payout change. The market value of equity (MV) is computed as the ending share price multiplied by the number of shares outstanding. Market-to-book (assets) is computed as (book assets – book equity + market value of equity) / book assets. Leverage ratio is book liabilities / market value of equity. The expected increase in dividend payout is the annualized change in quarterly dividends divided by a 10% discount rate and scaled by the stock price five days prior to the dividend change announcement. Percentage of shares sought is based on statements made by the company as recorded by Securities Data Company. Cumulative abnormal returns (CAR) for the announcement period are computed based on market model regressions for days –252 to –20 relative to the announcement. Tests for difference for the means are t-tests and the t-statistics are presented. Tests for difference for the medians are signed-rank tests and the Z-statistics are presented.

Characteristic of sample firms	Mean and Median	Repurchasers	Substantial dividend increasers	Test for difference with repurchasers	Small/routine dividend increasers	Test for difference with repurchasers
Market value of equity	Mean	2,111.54	1,924.07	0.97	2,168.60	-0.78
	Median	469.54	439.90	0.52	655.51	-4.57 ^c
Book assets	Mean	2,184.19	2,276.51	-0.43	2,235.01	-0.24
	Median	447.60	495.52	-2.09 ^c	622.49	-5.23 ^c
Market-to-book (assets)	Mean	1.67	1.54	3.94 ^c	1.66	-0.93
	Median	1.37	1.28	4.47 ^c	1.39	-1.57
Leverage ratio	Mean	0.73	0.94	-6.62 ^c	0.80	-2.40 ^b
	Median	0.49	0.64	-7.05 ^c	0.55	-3.31 ^c
Expected increase in dividend payout (% of MV)	Mean		4.56		2.77	
	Median		3.16		2.21	
% shares sought ^a	Mean	7.69				
	Median	5.85				
Announcement CAR (%)	Mean	2.06	1.19	2.94 ^c	0.26	6.04 ^c
	Median	1.81	0.88	3.47 ^c	0.16	7.37 ^c
Number of observations		1,062	2,943		2,045	

^a The number of observations with data available for shares sought is 676.

^b Significant at the 5% level.

^c Significant at the 1% level.

Table 3

Medians of the cash-flow shock, reversion of the shock, and permanence of the shock for 1,068 repurchasers, 2,961 substantial dividend increasers, and 2,046 small/routine dividend increasers. Cash-flow shock, reversion, and permanence are measured as raw differences in the ratio of cash flow-to-assets in Panel A and percentage changes in the ratio of cash flow-to-assets in Panel B.¹ The table also contains test statistics for the hypotheses that the medians are not different between the repurchasing sample and the dividend increasing samples. Dividend increases are subdivided into two groups: small/routine increases and substantial increases. A firm that has not had a dividend increase in the prior year or whose increase is larger than that from the previous year is included in the substantial increases group.

Firms	Cash-flow shock (median)	Reversion (median)	Permanence (median)
Panel A: Raw difference in cash flow-to-assets			
Repurchasers	0.005 ^c	-0.009 ^c	-0.009 ^c
Substantial dividend increases	0.007 ^c	-0.006 ^c	0.002
Z-test for substantial dividend increasers versus repurchasers	-1.587	-2.160 ^b	-4.425 ^c
Small/routine dividend increases	0.000	-0.005 ^c	-0.008 ^c
Z-test for small dividend increasers versus repurchasers	3.086 ^c	-2.303 ^b	-0.262
Z-test for small versus substantial dividend increasers.	-6.878 ^c	0.329	-6.565 ^c
<hr/>			
Panel B: Percentage change in cash flow-to-assets			
Repurchasers	4.218% ^c	-7.068% ^c	-8.578% ^b
Substantial dividend increases	6.427% ^c	-4.879% ^c	1.709% ^c
Z-test for substantial dividend increasers versus repurchasers	-1.785 ^a	-2.292 ^b	-4.660 ^c
Small/routine dividend increases	-0.204%	-4.844% ^c	-7.089% ^c
Z-test for small dividend increasers versus repurchasers	3.279 ^c	-2.540 ^b	-0.405
Z-test for small versus substantial dividend increasers	7.413 ^c	-0.315	6.714 ^c

^a Significantly different from zero at the 10% level.

^b Significantly different from zero at the 5% level.

^c Significantly different from zero at the 1% level.

¹ Cash-flow shock is: [Average (Cash Flow/TA) in years -1 and 0] - [Average (Cash flow/TA) in years -4 to -2] (TA is Total Assets). Reversion is: [Average (Cash flow/TA) in years +1 to +3] - [Average (Cash flow/TA) in years -1 and 0]. Permanence is: [Average (Cash flow/TA) in years +1 to +3] - [Average (Cash flow/TA) in years -4 to -2]. Percentage changes are computed by scaling the above raw difference by the second term in each expression.

Table 4

Sample repurchasing and dividend-increasing firms matched with firms that have not changed their payout policy. The control sample is generated by creating 20 portfolios of cash-flow shocks and matching each sample firm to a portfolio with a similar-sized cash-flow shock. Each control portfolio is restricted to contain only firms with the same two-digit Standard Industrial Classification (SIC) code as the sample firm. The raw and percentage-change reversion and permanence measures (as defined above in the footnotes to Table 3) are computed for the repurchasing subsample, the dividend-increasing subsamples, and the matching firms for each sample. The median difference between the sample firms and the matching firms are also reported for each case. Market-adjusted buy-and-hold returns for the cash-flow shock period are also computed for sample and control firms. The medians for each subsample along with the median paired difference between the sample firms and their control firms are presented.

The sample sizes are slightly smaller than in Table 3 because adequate matching firms could not be identified. Repurchasers numbered 1,051 firms; substantial dividend increasers, 2,900 firms; and small/routine dividend increasers, 2,010 firms. Because observations accounting for the extreme 1% of shock, reversion, or permanence are excluded, the sample firms differ slightly from Panel A to Panel B (accounting for the difference in sample firm returns between the two panels).

	Reversion (median)			Permanence (median)			Contemporaneous two-yr returns (median %)		
	Sample firms	Matching firms	Difference	Sample firms	Matching firms	difference	Sample firms	Matching firms	Difference
Panel A: Raw difference in cash flow-to-assets									
Repurchasers	-0.009 ^c	-0.012 ^c	0.003	-0.009 ^c	-0.008	0.003	2.029	2.225	-1.734
Substantial dividend increases	-0.006 ^c	-0.010 ^c	0.007 ^c	0.002	-0.005	0.007 ^c	12.033 ^c	6.201 ^c	6.668 ^c
Small/routine dividend increases	-0.005 ^c	-0.006 ^c	0.002 ^c	-0.008 ^c	-0.007 ^c	0.002 ^c	8.624 ^c	5.692 ^c	4.380 ^c
Panel B: Percentage change in cash flow-to-assets									
Repurchasers (%)	-6.900 ^c	-10.791 ^c	-1.889	-8.680 ^b	-7.102 ^a	-1.341	2.386 ^a	2.681 ^b	-3.103
Substantial dividend increasers (%)	-4.807 ^c	-8.528 ^c	2.683 ^c	1.728 ^c	-5.426	2.738 ^c	12.007 ^c	8.563 ^c	5.112 ^c
Small/routine dividend increasers (%)	-4.844 ^c	-4.969 ^c	-0.200	-7.047 ^c	-8.204 ^c	-0.339	8.737 ^c	6.100 ^c	4.129 ^c

^a Significantly different from zero at the 10% level.

^b Significantly different from zero at the 5% level.

^c Significantly different from zero at the 1% level.

Table 5

Announcement return regressions for dividend increases and repurchases. The announcement period is day -5 to day +5 relative to the dividend declaration date or the repurchase program announcement date. Cumulative abnormal returns are computed based on market model regressions for days -252 to -20. The adjusted returns are the residuals from the regression of stock returns over the two-year shock period on the cash flows from the same period [see Eq. (1)]. The adjusted returns are our proxies for the weight the market places on the permanence of the cash-flow shock. This return is also interacted with indicator variables for each of the dividend subsamples. Finally, because the predictions of the *permanence hypothesis* are strongest for dividend increasers with negative adjusted returns and for repurchasers with positive adjusted returns, the adjusted return variables are split into their positive and negative components. The size of payout variable is defined as the expected increase in dividends / market value (MV) for dividend-increasing firms and as the percentage of shares sought for repurchasing firms. In Column 5, size of payout is redefined for repurchasers to be the actual percent of shares repurchased during the 2 years following the announcement. Expected Increase in dividends / MV, percent of shares sought, total assets, market-to-book of assets, and leverage ratio are defined in Table 2. Cash / total assets is the ratio of cash and short-term investments (Compustat item 1) to total assets at the beginning of the fiscal year containing the distribution announcement. In Columns 1, 2, and 5, the regressions include a dummy variable set equal to one in the case of substantial dividend increases and zero otherwise, and a similar dummy variable for repurchases. Small/routine dividend increases are subsumed in the intercept. The specification in Column 2 uses only repurchasing firms from the restricted sample of firms that also had a dividend program in place. The t-statistics are in parentheses.

Regressor	Predicted sign	Full sample (1)	Restricted sample (2)	Dividend only (3)	Repurchase only (4)	Using actual repurchase amounts (5)
Intercept		2.28 ^c (3.24)	3.12 ^c (4.19)	1.90 ^c (3.90)	3.20 ^a (1.66)	2.93 ^c (4.22)
Substantial dividend dummy interacted with positive adjusted returns	-/0	-0.56 (-1.55)	-0.56 (-1.62)	-0.17 (-0.55)		-0.55 (-1.52)
with negative adjusted returns	-	-1.68 ^b (-2.38)	-1.41 ^b (-2.08)	-2.63 ^c (-4.45)		-1.71 ^b (-2.42)
Small/routine dividend dummy interacted with positive adjusted returns	-/0	0.63 (1.27)	0.53 (1.12)	-0.14 (-0.33)		0.65 (1.31)
with negative adjusted returns	-/0	-1.44 ^a (-1.83)	1.54 ^b (-2.06)	-0.07 (-0.12)		-1.42 ^a (-1.82)
Repurchase dummy interacted with positive adjusted returns	-	-1.36 ^a (-1.67)	-4.24 ^c (-3.37)		-2.12 ^b (-2.01)	-1.42 ^a (-1.75)
with negative adjusted returns	-/0	0.66 (0.51)	3.10 ^a (1.95)		-0.44 (-0.27)	0.65 (0.50)
Repurchase dummy	-	-0.75 (-1.37)	-1.66 ^c (-2.77)			-1.29 ^b (-2.41)
Substantial dividend dummy	+	1.04 ^c (3.42)	1.08 ^c (3.75)			1.07 ^c (3.50)
Controls						
Size of payout	+	0.10 ^c (3.17)	0.084 ^b (2.55)	0.32 ^c (4.50)	0.04 (0.79)	0.03 (0.99)
Cash-flow shock	-	5.51 ^c (3.02)	4.53 ^b (2.49)	4.26 ^b (2.23)	8.69 (1.58)	5.48 ^c (3.00)
Total assets	-	-0.17 ^c (-3.00)	-0.17 ^c (-3.01)	-0.19 ^c (-3.36)	-0.06 (-0.26)	-0.18 ^c (-3.08)
Market-to-book of assets	-	-0.64 ^c (-5.09)	-0.53 ^c (-4.26)	-0.45 ^c (-3.53)	-1.77 ^c (-3.78)	-0.67 ^c (-5.28)
Leverage ratio	+	0.17 (1.40)	0.16 (1.30)	0.17 (1.36)	0.16 (0.34)	0.18 (1.44)
Cash / total assets	+	2.46 ^c (2.80)	0.92 (1.05)	0.85 (0.94)	10.69 ^c (3.57)	2.50 ^c (2.83)
Adjusted R ²		0.037	0.032	0.031	0.059	0.034
Number of observations		3,612	3,429	3,147	473	3,612

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- ^a Significantly different from zero at the 10% level.
^b Significantly different from zero at the 5% level.
^c Significantly different from zero at the 1% level.

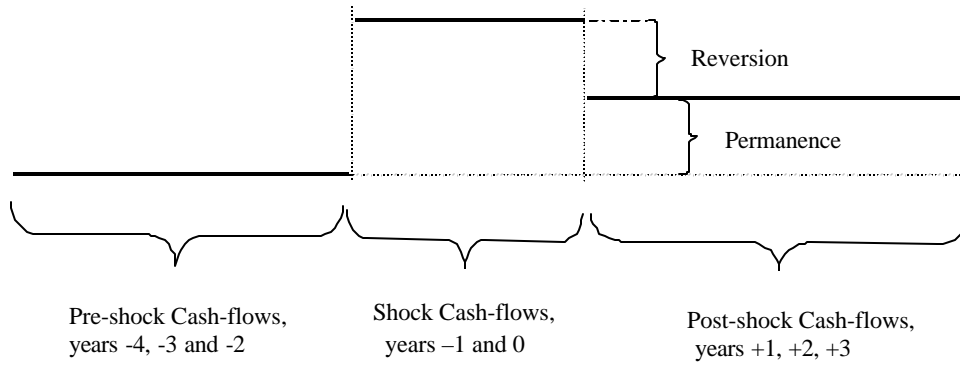


Fig. 1: Cash flow Time Series. The Cash-flow shock is (Shock Cash-flows – Pre-shock Cash-flows). Reversion is (Post-shock Cash-flows – Shock Cash-flows). Permanence is (Post-shock Cash-flows – Pre-shock Cash-flows). All cash flows are scaled by contemporaneous total assets.

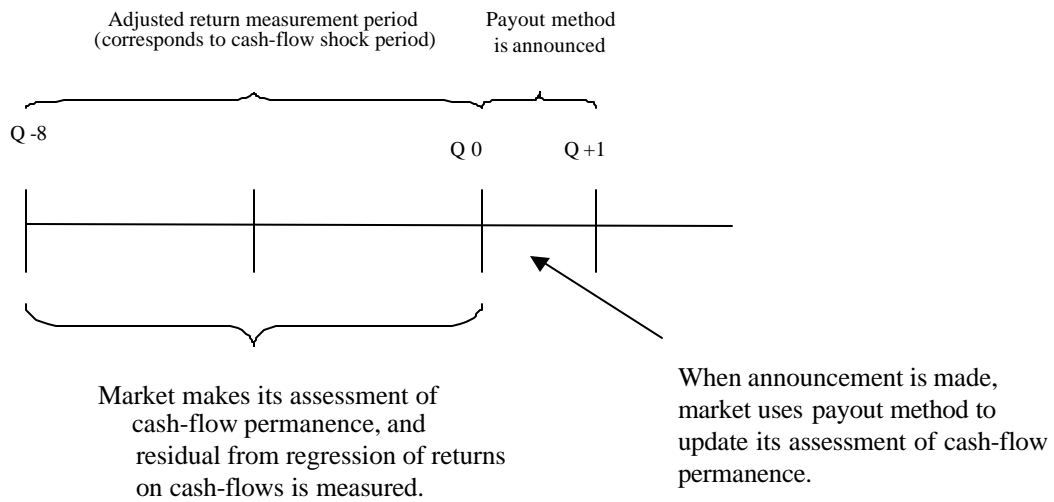


Fig. 2. Regression tests timeline

	Stock price reaction to cash flows	Dividend is announced	Repurchase is announced
Market believes cash-flow shock to be permanent	High [Residual from Eq. (1) is positive]	Effect of occurrence of payout on stock price: positive Effect of method of payout on stock price: 0 / small positive [0.23% / 1.19%]	Effect of occurrence of payout on stock price: positive Effect of method of payout on stock price: negative and more negative the stronger the belief that the shock was permanent [i.e., the greater the Eq. (1) residual] [0.20% / 0.87%]
Market believes cash-flow shock to be transitory	Low [Residual from Eq. (1) is negative]	Effect of occurrence of payout on stock price: positive Effect of method of payout on stock price: positive and more positive the stronger the belief that the shock was transitory [i.e., the more negative the Eq. (1) residual] [1.07% / 1.86%]	Effect of occurrence of payout on stock price: positive Effect of method of payout on stock price: 0 / small negative [-0.06% / 1.46%]

Fig. 3. Interaction between stock price reaction to cash-flow shock, the payout method choice, and the stock price reaction to the announcement. In each cell, two mean returns are also presented. The first is for payouts below the median payout level, and the second is for payouts above the median payout level. For example, dividend increasers with positive return residuals and an above-median payout had an average announcement return of 1.19%, compared with 0.87% for the comparable group of repurchasers. For the dividend column, only substantial dividend increasers are included.