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Preference for Dividends and Return Comovement

Allaudeen Hameed* and Jing Xie

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Abstract

Stocks that initiate dividends tend to comove more with other dividend-paying stocks and comove less with non-dividend payers. This is also true for: (a) dividend initiations that are motivated by the exogenous 2003 dividend tax cut; and (b) the cash dividend share class of Citizens Utilities (relative to its stock dividend class). We find that flows to dividend prone (averse) mutual funds increase the comovement among dividend-paying (non-dividend paying) stocks. Overall, the evidence supports the proposition that the trading of pro-dividend (dividend-averse) clienteles induces an extra factor in dividend payers (non-payers), beyond those associated with changes in common factors.

Keywords: Dividend; Dividend clientele; Comovement; Style investing

JEL classification: G12, G35, H20

*Corresponding Author.

Allaudeen Hameed is from the Department of Finance, NUS Business School, National University of Singapore, Address: 15 Kent Ridge Drive, Singapore, 119245, E-mail: allaudeen@nus.edu.sg; Jing Xie is from the School of Accounting and Finance, Hong Kong Polytechnic University; Address: Li Ka Shing Tower, Hung Hom, Hong Kong, Email: jingxie@polyu.edu.hk. We would like to thank Willian Schwert (the editor), an anonymous referee, Sudipto Dasgupta, Qianqian Du, Cesare Fracassi, Mark Grinblatt, Jia Hao, David Hirshleifer, Christian Lundblad, Harold Mulherin, Andy Puckett, Danjue Shang, Jay Shanken, Laura Starks, Matti Suominen, Avanidhar Subrahmanyam, Sheridan Titman, Di Wu, Dong Yan, Jianfeng Yu, seminar participants at Aalto University, Chinese University of Hong Kong, ESADE, Lancaster University, National University of Singapore, University of Adelaide, University of Hawaii, University of Hong Kong, University of Queensland, University of Texas at Austin, participants at China International Conference in Finance, Asian Financial Association conference, Hong Kong Joint Finance Research Workshop, Conference on Asia-Pacific Financial Markets, and 2018 Financial Management Association conferences for helpful comments. Hameed is grateful to NUS Academic Research Grants for financial support. Xie is grateful to Hong Kong Polytechnic University Start-up Research Grant for financial support. All errors are our own.

1. Introduction

The pioneering works by Barberis and Shleifer (2003) and Barberis, Shleifer, and Wurgler (2005) present models where investors allocate capital at the level of asset categories rather than individual stocks. Their studies show that category investing and trading habitats of shareholder clienteles generate comovement in stock returns as investor capital flows in and out of specific categories, or styles create demand pressure for stocks. Consistent with this argument, follow-on empirical studies show, for example, that stocks added to the index covary more with other stocks already in the index, and the increased comovement cannot be explained by changes in fundamental correlations (Barberis, Shleifer, and Wurgler, 2005; Greenwood, 2008; Green and Hwang, 2009; Boyer, 2011). However, recent work in Chen, Singal, and Whitelaw (2016) casts doubt on excess comovement stemming from index additions (Barberis, Shleifer, and Wurgler, 2005) or stock splits (Green and Hwang, 2009), arguing that the changes in these comovement patterns are driven by prior stock return performance.

In this paper, we provide fresh evidence of return comovement driven by investor preference for dividends. We find that investors view a stock's dividend characteristics as a salient category and move their funds in and out of the category, causing stocks within the category to move together. There is ample theoretical work and empirical evidence establishing retail and institutional dividend clienteles based on investor tax status, income and risk preferences, investor sentiment, and cognitive biases.[1] It is interesting that some investment funds explicitly state their preference for dividends in their fund objectives. For example, Lipper classifies as Equity Income Funds (code "EI" or "EIEI" or "GI") those funds that invest primarily in dividend-paying equity securities, and whose "gross or net yield is greater than 125% of the average gross or net yield of the U.S. diversified equity fund universe." As plotted in Fig. 1, the asset under management (AUM) of these income funds defined by

[1] Theoretical studies attribute investor clientele with high or low preferences for dividends to investor characteristics such as tax status, age, income, and risk preferences or investor choice behaviour (Miller and Modigliani, 1961; Elton and Gruber, 1970; Shefrin and Statman, 1984; Allen, Bernardo, and Welch, 2000). The empirical evidence relates dividend clienteles to tax reasons (Poterba, 2004; Graham and Kumar, 2006; Desai and Jin, 2011; Kawano, 2014), age (Becker, Ivkovic, and Weisbenner, 2011), institutional investment styles (Hotchkiss and Lawrence, 2007), investor sentiment (Baker and Wurgler, 2004), among others.

Lipper varies from US$800 billion to US$2.4 trillion over the period 1998 to 2014. As a fraction of total AUM, these funds account for between 8% and 15%. From a practitioner perspective, funds often explicitly state that their selection of stocks is based on stocks' dividend status in their fund prospectus. Examples of such funds include: (a) Fidelity Equity Dividend Income Fund, whose investment strategy is to invest "primarily in income-producing equity securities that pay current dividends and show potential for capital appreciation"; (b) T. Rowe Price Dividend Growth Fund, which describes itself as a "fund seeking dividend income and long-term capital growth through investments in dividend-paying stocks"; (c) Vanguard Equity Income Fund, which "invests mainly in common stocks of mid-size and large companies whose stocks typically pay above-average levels of dividend income." These observations indicate significant interest in dividend stocks among some funds to attract specific clientele. At the same time, there are also clientele forces that are against dividends. These include investors with high tax rates (Kawano, 2014), young and high income retail investors (Graham and Kumar, 2006), dividend-averse institutional shareholders (Desai and Jin, 2011), and foreign institutional investors (Dahlquist and Robertsson, 2001).

Using dividend initiations by firms trading on NYSE/Amex and Nasdaq over the 1981 to 2012 period, we find strong evidence linking return comovement to dividend clientele. The sensitivity (or beta) of stock returns to the portfolio of dividend-paying stocks increases from 0.16 to 0.38 (a difference of 0.22 (t=3.29)) for firms that initiate dividends and their beta with respect to the portfolio of non-dividend payers decreases from 0.30 to 0.22 (a difference of -0.08 (t=-2.62)). These changes in return comovement when firms decide to start paying dividends are economically significant and highly robust. The changes in comovement we show are unaffected when we purge for common factors in returns using Fama-French and Carhart four-factor models and address the estimation issues raised in Chen, Singal, and Whitelaw (2016).

Note that our findings are not due to changes in fundamental risk of firms that start making dividend payments. We address this important issue in several ways. We show that the set of control firms that share the same firm characteristics and propensity to pay dividends do not exhibit similar changes in return comovement, where the matching firms are constructed following Fama and French (2001), Baker and Wurgler (2004), Hoberg and Prabhala (2009), and Chen, Singal, and Whitelaw

(2016). The difference-in-difference test results are similar when we choose the control firms as payers or nonpayers when matching with the dividend initiators. Taken together with the control for Fama-French-Carhart risk factors, we find that differences in exposure to risk factors cannot fully explain our results.[2]

Next, we use a tax reform that is exogenous to firm fundamentals but affects dividend clientele as an identification strategy. As noted in Chetty and Saez (2005), the Jobs and Growth Tax Relief Reconciliation Act of 2003 in the United States (hereafter, the "2003 Tax Cut") is relatively exogenous to firm fundamentals but increases firms' incentive to cater to investor demand for dividend stocks (see also Kawano, 2014). We find that firms that initiate dividends following the 2003 Tax Cut comove significantly more (less) with other firms that consistently pay (do not pay) dividends. For example, the comovement beta for dividend initiators with the portfolio of dividend payers increases by 0.55 (t=3.63). We do not observe similar changes in the comovement of matched firms that already pay dividends prior to the 2003 Tax Cut.[3] Hence, the tax cut event links the change in return comovement of dividend initiators to the change in their dividend status (and clientele) driven by an exogenous shock.

We also use the unique dividend arrangement of the common shares of Citizens Utilities Company (CU) as a natural experiment to isolate the effects of fundamental risk on return comovement. CU had two classes of common stock that are identical except for their form of dividend payments, where one class of shares received stock dividends (Series A) and the other class (Series B) received an equivalent fair-market value in tax-deferred cash dividends.[4] In 1990, the special status of CU dual class shares expired and CU terminated the cash dividends on its Series B and started paying the same stock dividends on both Series A and B classes, providing a unique setting for our analyses. Consistent with our hypothesis that return comovement is influenced by dividend clientele effects, we

[2] We report that dividend initiators experience a decrease in their exposure to the size (SMB) and market factors but their exposure to the value (HML) factor increases, similar to Fama and French (1993).

[3] Our findings are consistent with Sialm and Starks (2012), who find that the 2003 Tax Cut increases the propensity of some funds to hold dividend-paying stocks.

[4] This special arrangement was made possible by the Internal Revenue Service (IRS) ruling and applied to the period from 1955 to 1990. Exploiting the differences in the relative prices of the two classes of shares, Long (1978) finds evidence in favour of investor preference for dividends despite the tax disadvantage of cash dividends. Using a later sample period, Poterba (1986) argues that CU investors are indifferent between the same amount cash and stock dividends.

find that the returns on the cash dividend class of CU comove more with other cash dividend payers than the stock dividend class in the period prior to 1990. However, after the special arrangement for the cash class was terminated in 1990, we find no evidence of differences in the comovement of returns with the portfolio of other dividend payers for either class of CU stock. Since the two stock classes shared the same fundamentals, the change in return comovement is not likely to be due to changes in risk and, hence, supports a clientele-based explanation for commonality in returns among dividend-paying stocks.

As a robustness check, placebo tests are introduced to see if the dividend initiations are unique in affecting changes in the stock return covariations. We estimate the comovement in stock returns one, three, and five years after the initiations, with the expectation that we should not see any subsequent change in comovement. This is indeed what we find. Finally, to complete our understanding regarding the role of corporate payouts in shaping investor clientele, we analyse share repurchase initiation events. Unlike dividend initiations, we find no evidence of changes in comovement around repurchase initiations, suggesting that dividend-based clientele effects are different from those arising from other forms of payouts.

Beyond comovement in stock returns, we analyse turnover comovement for dividend initiators relative to a matched control sample. We find that dividend initiators register an increase in turnover comovement with dividend-paying stocks from 0.47 to 0.56 after initiations (a difference of 0.09 (t=2.11)). There is also a simultaneous decrease in comovement with non-dividend paying stocks from 0.56 to 0.44 (a difference of -0.12 (t=-2.63)). This new evidence of comovement in trading activities strongly supports the investor clientele/trading habitat view espoused in Barberis and Shleifer (2003).

To shed light on the drivers of dividend-clientele-induced return comovement, we present evidence of significant changes in the institutional investor base and fund flows in response to changes in corporate dividend policies. We find that mutual funds that historically prefer high (low) dividends tilt their portfolio holdings towards (away from) the dividend initiators. More importantly, mutual funds that have a preference for dividend stocks receive greater inflows when the premium for dividend is higher. We employ the dividend premium measure in Baker and Wurgler (2004), which is the difference in the valuation of dividend payers and nonpayers, to identify periods of high/low preference for dividends. Our evidence supports the hypothesis that investor preference for dividend-paying stocks varies over time and this demand for dividends affects fund flows associated with the dividend clientele. Specifically, we find that a one standard deviation increase in the dividend premium is associated with about 4% higher inflows per annum to funds that have a greater preference for holding dividend-paying stocks. Equivalently, we also find a net outflow of similar magnitude for funds that are averse to dividends.

To summarize, we document several empirical regularities consistent with a (time-varying) common dividend factor that drives stock return comovement. First, we find that stock returns of dividend initiators are associated with an increased comovement with other dividend payers and decreased comovement with nonpayers. Second, this finding is also true for dividend initiations that are motivated by the exogenous 2003 dividend tax-cut. Third, the same finding holds for the two stock classes of Citizens Utilities Company, where the stock returns on the cash dividend class comove with other dividend payers more than the otherwise identical stock dividend class. Finally, we show that mutual funds with a greater preference for dividend-paying stocks receive more inflows when investor preference for dividends is stronger. This in turn induces stronger return comovement of dividend initiators with other dividend payers as money flows into the dividend category, particularly in periods of high dividend sentiment. Overall, our evidence supports clientele-based trading as a significant driver of return comovement.

The paper is organized as follows. Section 2 presents the empirical methodology to test for return comovement related to dividend clientele. Section 3 provides evidence of changes in ownership by mutual funds with varying preference for dividends, and the effect of mutual fund flows associated with the investor clienteles. Section 4 concludes.

2. Dividend initiations and return comovement

2. 1. Data and methodology

Stock returns, trading volume, and other shares-related data come from Center for Research in Security Prices (CRSP) daily and monthly files. Our sample firms include all common stocks with shares codes of 10 and 11 trading on NYSE/Amex and Nasdaq from 1981 to 2012. All accounting data, including total assets, book value of equity, return on assets, and dividend per share are obtained from Compustat.

Our primary analysis is based on the set of firms that initiate dividends.[5] Each year, we identify dividend initiators as firms that pay dividends in the current year, but not in the previous years. We use the dividend per share reported in the annual financial reports obtained from Compustat to identify firms that initiate dividends. These firms are labeled as dividend initiators. For each dividend initiator, we create a matched sample of control firms with similar propensity to pay dividends, but that do not experience a change in dividend policy. We consider two sets of firms in the matched sample.

In the first set, we choose a matched firm that has similar ex ante propensity to initiate dividends from the group of non-dividend paying firms. Specifically, we estimate the likelihood that a firm is a dividend initiator using firm characteristics that are related to the propensity to initiate dividends. This follows the logit models on the propensity to pay dividends in Fama and French (2001), Baker and Wurgler (2004), and Hoberg and Prabhala (2009). The accounting characteristics that predict dividend initiations in these models include total assets (log(1+total assets)), the ratio of market-to-book value of equity, return on assets (ratio of operating income before depreciation to total assets), and leverage (the ratio of long-term debt to total assets). Hoberg and Prabhala (2009) emphasize that firm risk is an important predictor of propensity to pay dividends. We follow Hoberg and Prabhala and add the

[5] We investigate dividend initiations rather than dividend omissions as omissions are confounded by many other factors that make them less exogenous. For example, Brav, Graham, Harvey, and Michaely (2005) report that firms have a strong preference to maintain dividends and avoid reducing or omitting dividends, except in extreme circumstances, due to the accompanying negative consequences. Michaely, Thaler, and Womack (1995) find that dividend omissions are associated with strong, negative stock price reactions. Moreover, DeAngelo and DeAngelo (1990) show that troubled firms display a stronger reluctance to omit dividends relative to reduction in dividends and suggest that dividend omission is generally used as a “last resort.”

stock's idiosyncratic volatility as an additional matching variable, measured by the standard deviation of residuals estimated from a market model using daily returns in the past year. Given the recent findings in Chen, Singal, and Whitelaw (2016) that changes in return comovement are related to past stock performance, we also match stocks on their stock returns in the past year. Hence, we match each dividend initiator to a control firm that has the closest propensity to initiate dividends and require the difference in propensity between dividend initiators and control firms to be less than five percent. In the second set, we draw the control firms from the group of firms that paid dividends in the prior year. Again, the matching firm is selected if they are similar in terms of the propensity to pay dividends. In arriving at a set of control firms, we exclude dividend-initiating firms that do not have a matched firm.

For each firm *i* that initiates dividends in year *t*, we examine the comovement of stock *i*'s daily returns with the daily returns on two benchmark portfolios. The first portfolio consists of stocks that pay regular dividends in the four years leading to year *t* (i.e., those that pay dividends from year *t*-3 to *t*), denoting the (equal-weighted) portfolio return on day *d* as $MKT_{D,d}$. The second portfolio consists of stocks that did not distribute any dividends in the four years prior to *t* (i.e., zero dividends from year *t*-3 to *t*), with the corresponding daily (equal-weighted) portfolio return denoted as $MKT_{ND,d}$. We require that stocks in the benchmark portfolios have at least 200 daily return observations each year to avoid the effect of non-synchronous trading. Firms that are classified into these benchmark portfolios are held constant when we estimate the return comovement during the year before and after dividend initiation. The dividend initiators and the control firms are excluded from both benchmark portfolios.

To measure excess comovement with the two benchmark portfolios, we regress stock returns of dividend initiators on the two benchmark portfolio returns, purging the effects of common risk factors. Specifically, we estimate the following bivariate regression model:

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RES,d}} + \gamma_i * MKT_{ND_{RES,d}} + \delta * X_d + \varepsilon_{i,d}, \quad (1)$$

where $Ret_{i,d}$ is the return on dividend initiator *i* on day *d*; $MKT_{D_{RES},d}$ ($MKT_{ND_{RES,d}}$) refer to residuals of the dividend-(non-dividend) paying benchmark portfolio returns when regressed on the Fama-French-Carhart four-factor model that comprises excess market return, small-minus-big firm factor (SMB), high-minus-low book-to-market factor (HML), and the Carhart momentum factor (MOM). *X* refers to a vector of the same four risk factors. Eq. (1) is estimated for the pre-dividend initiation year (i.e. year *t*-1, denoted as *Pre*) and in the post-initiation year (i.e., year *t*+1, denoted as *Post*).[6] We employ an equivalent specification to estimate the changes in return comovement for the control firms. Specifically, we estimate the following regression model for each control firm *c*:

$$Ret_{c,d} = \alpha_c + \beta_c * MKT_{D_{RES,d}} + \gamma_c * MKT_{ND_{RES,d}} + \delta_c * \ X_d + \varepsilon_{c,d}, \tag{2}$$

where $Ret_{c,d}$ is the return on the control firm c on day d and all the independent variables are identical to those defined in Eq. (1). Hence, for each dividend initiator firm *i* in year *t*, we obtain four comovement measures from Eq. (1): the comovement with the dividend-paying benchmark portfolio in the *Pre* and *Post* periods (denoted as $\beta_{i,Pre}$ and $\beta_{i,Post}$) and the comovement with the non-dividend benchmark portfolio in the *Pre* and *Post* periods (denoted as $\gamma_{i,Pre}$ and $\gamma_{i,Post}$). Likewise, Eq. (2) estimates the comovement measures for the control firm *c*: comovement with the dividend portfolio, denoted as $\beta_{c,Pre}$ and $\beta_{c,Post}$ and the comovement with non-dividend portfolio, denoted as ($\gamma_{c,Pre}$ and $\gamma_{c,Post}$) .

The key tests involve gauging the changes in return comovement around the dividend initiation events. To do this, we average the changes in the regression coefficients across all *n* dividend initiators in the *Pre* and *Post* periods:

$$\Delta\overline{\beta} = \textstyle\sum_{i=1}^{n} (\beta_{i,Post} \ - \beta_{i,Pre}))/n, \tag{3a}$$

$$\Delta\overline{\gamma} = \textstyle\sum_{i=1}^{n} (\gamma_{i,Post} \ - \gamma_{i,Pre})/n. \tag{3b}$$

The corresponding average changes in the comovement coefficients across all control firms are denoted as $\Delta\overline{\beta_c}$ and $\Delta\overline{\gamma_c}$.

The joint hypotheses of the presence of dividend clienteles and clientele-based return comovement predict that firms that initiate dividends will experience an increase in return comovement with other dividend-paying stocks ($\Delta\overline{\beta}$ > 0) and a decrease in comovement with non-dividend paying stocks ($\Delta\overline{\gamma} < 0$). Moreover, the hypothesis also implies that we should not observe significant changes in the comovement of the control samples if there are no changes in firm

[6] We report results when the *Pre* period in from April of year *t*-1 to March of year *t* and the *Post* period is from April of year *t*+1 to March of year *t*+2. We obtain similar results if the *Pre* and *Post* periods are measured from January or July of *t*-1 and *t*+1, respectively.

fundamentals: $\Delta\overline{\beta_c} = 0$, and $\Delta\overline{\gamma_c}$ =0. Put together, the dividend clientele-based notion of comovement predicts that the increase in the comovement of the initiator stocks with other dividend-paying (non-dividend) stocks is higher (lower) than that for the control firms.

2.2. Baseline results

In our first set of tests, we compare the changes in return comovement of the dividend initiators with the control firms drawn from non-dividend payers. Our sample contains 1,427 dividend initiators with matched control firms over the period 1981 to 2012. Table 1, Panel A, presents the average firm characteristics of the dividend initiators and the control firms. The dividend initiators and control firms display similar mean and median values of the accounting-based firm characteristics of asset size, market-to-book, profitability, and leverage. Moreover, these firms are also similar in terms of idiosyncratic return volatility and have performed equally well in the past year. As shown in the last column of Panel A, the average firm characteristics of the control sample are not significantly different from the dividend initiators, suggesting that we are able to identify control firms with similar propensity to initiate dividends.

As shown in Panel B of Table 1, the returns on dividend-initiating firms covary more with returns on other dividend-paying stocks after they start paying dividends. After accounting for the common factors represented by the Fama-French-Carhart four-factor model, the initiator stocks register an increase in comovement with dividend-paying stocks from 0.16 to 0.38, and the change in comovement is significant, $\Delta\overline{\beta}$ =0.22 (*t*=3.29). There is also a simultaneous decrease in comovement with non-dividend paying stocks from 0.30 to 0.22, and, $\Delta\overline{\gamma}$=-0.08 (*t*=-2.62). The magnitude of changes in the return comovement is also economically significant for $\Delta\overline{\beta}$ and $\Delta\overline{\gamma}$, and is comparable to the magnitude of changes in return comovement reported in Boyer (2011) for Growth/Value stocks.

To elaborate, during the pre-event window, dividend initiators comove more with non-dividend stocks, $\beta_{i,Pre} - \gamma_{i,Pre}$ = -0.14 (*t*=-2.50), and the comovement changes dramatically after they initiate dividend payments, $\beta_{i,Post} - \gamma_{i,Post}$ = 0.16 (*t*=3.2) and the corresponding difference-in-difference estimate, $\Delta\overline{\beta} - \Delta\overline{\gamma} = 0.30$ (*t*=4.26), is large. Hence, we observe striking changes in the return comovement when firms start paying dividends, providing evidence in favour of dividend-clientele-based comovement.

These findings are in stark contrast to the absence of any changes in comovement for the control firms. Table 1, Panel C presents the results for the propensity matched sample. Firms in the control group have higher (lower) comovement with non-dividend (dividend-) paying stocks in both the pre- and post-event windows. We do not find evidence of any changes in the comovement of these control firms with other dividend-paying stocks (i.e., $\Delta\overline{\beta_c} = -0.05$ $(t = -0.78)$) or with other non-dividend paying stocks ($\Delta\gamma_c = 0.03$ $(t = 0.85)$). Hence, in the absence of any changes in their decision to pay dividends, there is no change in return comovement for the control firms: $\Delta\overline{\beta_c}$ - $\Delta\overline{\gamma_c} = 0.08$ (*t*=-1.10).

Finally, Panel D of Table 1 presents the relative changes in return comovement across the dividend initiators and control firms. Given the results in Panels B and C of Table 1, it is not surprising that the dividend initiators experience increases in their comovement with other dividend-paying stocks that are larger than those for the control firms, i.e., $\Delta\overline{\beta} - \Delta\overline{\beta_c} = 0.28$ (*t*=2.87). The grand difference-in-difference in the estimated coefficients, i.e., $\left(\Delta\overline{\beta} - \Delta\overline{\beta_c}\right) - \left(\Delta\overline{\gamma} - \Delta\overline{\gamma_c}\right)$, is a positive 0.38 and significant (*t*=3.83). The primary difference in the comovement between the dividend initiators and the control group comes from the post period rather than the pre period, as one would expect.[7] Hence, the results reinforce our contention that the changes in return comovement of dividend-initiating firms are not driven by changes in firm fundamentals, and are consistent with comovement arising from changes in investor clientele.

Our main findings are highly robust. We find that the overall results hold in three equal sub-periods: 1983 to 1992, 1993 to 2002, and 2003 to 2012. The magnitude of coefficients for the difference-in-difference tests (i.e., $\Delta\overline{\beta} - \Delta\overline{\gamma}$) is similar across sub-periods (ranging from 0.23 to 0.27) and is slightly higher in the first decade from 1983 to 1992. We also obtain similar results when we replace daily returns with weekly returns in estimating the comovement coefficients. Again, the

[7] Our estimates of changes in comovement are unaffected if we require the dividend initiators to be nonpayers in the previous two or more years or if we require that these firms pay dividends for multiple years in the *Post* period. Similarly, requiring the control firms to have constant dividend decisions in multiple years does not change our findings.

net change in the coefficients ($\Delta\overline{\beta} - \Delta\overline{\gamma}$) using weekly data is 0.25, which is significant with a *t*-statistic of 3.09. The results in Table 1 are unchanged when we replace the benchmark portfolio returns in Eqs. (1) and (2) with the unadjusted or raw returns on the two indexes: we obtain an average $\Delta\overline{\beta} - \Delta\overline{\gamma}$ of 0.18 (*t*=5.53). To rule out the effect of outliers, we consider removing from the sample the firms that have extreme estimates of β and γ, where we consider values above 2 or below -2 as outliers and delete them. Our results are also unaffected when we remove these outliers. Finally, the findings in Table 1 are also robust to an alternative matching procedure where we require that the control firms belong to the same industry as the dividend initiator. This additional requirement reduces the sample number of firms by about one-third, but we obtain qualitatively similar results. In all these different specifications, we obtain an increase in the comovement of dividend initiators with other dividend-paying stocks and a decrease in comovement with non-dividend paying stocks.

2.3. Dividend initiations and return comovement: 2003 tax cut evidence

The Jobs and Growth Tax Relief Reconciliation Act of 2003 was introduced in the United States to effectively reduce the top tax rate on corporate dividend income to 15%. Although the Act (which we will label the “2003 Tax Cut”) was enacted on May 28, 2003, the tax cut on individuals’ dividend income was effective from January 2003, when it was first proposed by the U.S. President. Several studies have examined the effect of the unanticipated 2003 Tax Cut on corporate and individual behaviour. For example, Chetty and Saez (2005) report a huge increase in the number of firms that initiate dividends immediately after the enactment of the law, starting from the third quarter of 2003. Their findings show that the corporate dividend initiations were in response to the 2003 Tax Cut and are not confounded by other factors that may influence the payout decision. We confirm these observations in unreported tables: we find that the number of dividend-paying firms declines from 1996 to 2002 (Fama and French, 2001) before surging in 2003 and 2004, although the total number of listed firms declined modestly starting from 2002.

With the reduction in the differential tax rate applied to dividend income and capital gains, the 2003 Tax Cut reduces the tax disadvantage of dividends for the taxable investors. While the increase in the number of dividend payers is consistent with prior studies arguing for tax status as a driver for dividend clientele (Elton and Gruber, 1970; Allen, Bernardo, and Welch, 2000; Graham, 2003; Poterba, 2004), the 2003 Tax Cut potentially reduces the tax-based dividend clientele. For example, Sialm and Starks (2012) find that mutual funds held primarily by taxable investors increased their relative propensities to hold high-dividend yield stocks after the 2003 tax cut, suggesting a diminishing tax-based dividend clientele. Moreover, Brav, Graham, Harvey, and Michaely (2008) argue that the 2003 Tax Cut had only a second-order effect on the payout decision by corporations as the increase in dividend initiations did not last long. Our analyses of dividend-based return comovement around the tax cut are consistent with non-tax reasons for investors to prefer dividend stocks.

We focus on the firms that initiate dividends in the 2003 fiscal year, and investigate how the return comovement changes for these firms. The dividend-initiation decision, after the 2003 Tax Cut Act enacted in May 2003, is relatively unrelated to firm-specific fundamentals, as argued by Chetty and Saez (2005). Therefore, analysing changes in return comovement around these dividend initiations can help to distinguish the clientele hypothesis from return comovement driven by firm fundamentals.

The empirical approach is similar to the analysis in Section 2.2. Each firm that initiates dividends in the fiscal year 2003 is matched with a control firm using the propensity-score-matching algorithm. Unlike the main results in Section 2.2, we now choose the control firms from among those that consistently pay dividends in the four years prior to 2003: the control firm that has the same firm characteristics in year 2002 in terms of total assets, the ratio of market-to-book value of equity, return on assets, idiosyncratic risk, leverage, and past one-year stock return. We find matching control firms corresponding to 138 dividend initiators, which make up our final sample. It is important to note that the control firms are dividend payers prior to 2002 and the dividend initiators share the same firm characteristics as the control firms, but initiated dividends following the 2003 Tax Cut (an exogenous event). In unreported results, we use dividend initiators in the pre-2003 period (i.e., from 1998 to 2002) as control firms and arrive at similar conclusions.

The dividend initiators and control firms in Panel A of Table 2 share similar fundamental characteristics: the mean and median values are not significantly different for the two groups. Hence, the set of sample firms that we identify as dividend initiators after the tax cut in 2003 are similar to the set of control firms that are dividend payers prior to the tax cut.

Next, we report the coefficients estimated from the regressions in Eqs. (1) and (2) for dividend initiators and control firms for the *Pre* (from April 2002 to March 2003) and the *Post* (from April 2004 to Mar 2005) event windows. As before, the dividend initiators and control firms are excluded from the dividend and non-dividend benchmark portfolios. Table 2, Panel B shows that the dividend initiators exhibit an economically significant increase in the comovement with other dividend stocks, $\Delta\overline{\beta} = 0.55$ (*t*=3.63). The difference-in-difference test for the effect of dividend initiation is also significant, $\Delta\overline{\beta} - \Delta\overline{\gamma} = 0.54$ (*t*=3.52) as shown in Panel B. Panel C shows that the comovement estimates for the control firms are not affected in a similar way, $\Delta\overline{\beta_c} - \Delta\overline{\gamma_c} = 0.010$ (*t*=0.06). In comparing the changes in comovement for the dividend initiators relative to the changes in the control firms in Panel D, $\left(\Delta\overline{\beta} - \Delta\overline{\beta_c}\right) - (\Delta\overline{\gamma} - \Delta\overline{\gamma_c})$, the net increase in return comovement of dividend initiators with other dividend-paying stocks is a dramatic 0.53% (*t*=2.42). Since the decision by some firms to initiate dividends is driven by the exogenous change in U.S. tax code in 2003, the evidence in Table 2 strongly supports the notion of dividend-clientele-induced return comovement.

2.4. Cash and stock classes of Citizens Utilities: a natural experiment

The share class arrangement of Citizens Utilities (CU) Company provides a natural experiment to isolate the effect of dividend policy on return comovement.[8] CU has two classes of common stock that are identical except for the form of dividend payments. One class of shares received stock dividends and the other class received cash dividends. As described in detail in Long (1978), a special Internal Revenue Service ruling allowed CU to have the dual class structure where Series A shares receive tax-deferred stock dividends while Series B paid cash dividends of equal fair-market value. This special arrangement for CU was for the period from 1955 to 1990. Long (1978) and Poterba (1986)

[8] We thank an anonymous referee for making this excellent suggestion.

exploit the differences in the relative prices of the two classes of shares to investigate investors' preference for cash dividends. While Long (1978) finds relative preference for cash dividends despite a tax disadvantage of dividend income, Poterba's (1986) results using a later sample period point to investor indifference between cash and stock dividends of equal amounts.[9]

In 1990, when the special status for CU dual class shares expired, CU terminated cash dividends on its Series B shares and started paying the same stock dividends on both A and B shares. The stock dividends on both share classes are tax deferred and taxed only when the shares are sold, removing the difference in the type of dividends between the two classes. Hence, the change in the type of dividends paid in the Series B shares (relative to Series A shares) provides a unique opportunity to test our hypothesis for the effect of the policy on cash dividends on the stock's comovement with other dividend-paying stocks. Under the maintained hypothesis of dividend-clientele effects, we expect the cash-dividend class (Series B) to have greater return comovement with other dividend payers than the stock-dividend class (Series A) in the period prior to 1990, and the difference in return comovement to disappear after 1990 when both classes of shares pay stock dividends.

Using the daily returns on the two classes of shares of Citizens Utilities, we estimate the following regression:

$$R_{j,d} = \alpha_o + \alpha_1 D_B + \beta_A MKT_{DRES,d} + \beta_{B-A} MKT_{DRES,d} * D_B + \delta X_d + \epsilon_{j,d}, \tag{4}$$

where $R_{j,d}$ is the return of CU stock on day *d*, and *j*=A or B class shares; D_B is a dummy variable that takes a value of one if stock j is Series B (cash dividend) and zero otherwise; the Fama-French-Carhart adjusted residual daily returns on the portfolio of dividend payers ($MKT_{DRES,d}$) and the vector of Fama-French-Carhart four factors (X_d) as defined in Section 2.2 (we exclude CU stock from $MKT_{DRES,d}$). We fit the regression model in (4) over two sub-periods: the *Pre-1990* period when Series B paid cash dividends, defined as the period from January 1984 to December 1988 and the *Post-1990* period, from January 1991 to December 1995, when both classes of CU paid stock

[9] See Long (1978) for a detailed description of the IRS ruling that allowed CU to have the two classes of common stocks. Hubbard and Michaely (1997) provide updated information on the dividend arrangement for CU, including the termination of the special dividend status in 1990.

dividends.[10] If paying cash dividends increases the stock's comovement with other dividend payers, we expect β_{B-A} in Eq. (4) to be positive in the *Pre-1990* sub-period, but not in the *Post-1990* period.

We also consider an alternative specification to test for the variation in comovement of Series A and B in the *Pre-1990* and *Post-1990* periods. Specifically, we estimate the changes in the coefficient of comovement of $R_{j,d}$ with the dividend-payer portfolio $MKT_{DRES,d}$ for each class of shares (*j*=A or B), adding a dummy variable, D_{Post}, that is equal to one (zero) during the *Post-1990* (*Pre-1990*) sub-period:

$$R_{j,d} = \alpha_o + \alpha_1 D_{Post} + \beta_{Pre} MKT_{DRES,d} + \beta_{Post-Pre} MKT_{DRES,d} * D_{Post} + \delta X_d + \delta_{Post} X_d * D_{Post} + \epsilon_{j,d}. \quad (5)$$

Here, we allow CU's exposure to the Fama-French-Carhart (FFC) factors to vary over the sub-periods. If the comovement of the return on the cash class of CU stock (Series B) with dividend payers is related to our clientele hypothesis, we expect a decrease in the comovement estimate ($\beta_{Post-Pre} < 0$). Moreover, we do not expect any change in the comovement of Series A shares since there is no change in the stock-dividend status of these shares.

Table 3 presents the comovement estimates for the two classes of CU stock. In Panel A, we present descriptive statistics of the returns of Series A and B shares over the *Pre-1990* and *Post-1990* sub-periods. As expected, there is no significant difference in the mean returns in these two share classes, confirming that the two stocks are fundamentally similar, and the payment of cash dividends to one class only in the *Pre-1990* period does not change this. Interestingly, the correlation in returns between A and B shares is low in the *Pre-1990* period at 0.38, indicating that the correlations in the returns on the two stock classes are lower than seem warranted by fundamentals.

We present the estimates of the regression model in Eqs. (4) and (5) in Panel B of Table 3. Model 1 shows that the comovement of returns on Series B (cash class) with the portfolio of dividend payers

[10] CU paid its first stock dividend on Series B in February 1990 when it switched from cash to stock dividend for both stock classes, although the IRS ruling on the status of Series A and B continues till December 1990. Our reported results skip 1989 and 1990 in the *Pre-1990* and *Post-1990* sub-periods, but the findings remain if we include these two years in the sample period. The time series of cash and stock dividends for the two classes of CU shares for the period 1984 to 1995 are provided in Appendix A. There were two tax reforms during this period: (a) the Tax Reform Act of 1986 which increased the capital gains tax from 20% to 28%; (b) Revenue Reconciliation Act of 1993 which increased the maximum individual income tax rate from 31% to 39.6%. These changes in tax laws do not have material impact on our findings.

is significantly higher than Series A during the *Pre-1990* sub-period. The coefficient of interest in Eq. (4), β_{B-A}, is positive and significant, while Series A (stock dividend class) does not display significant comovement with other dividend payers. At the same time, when both classes of shares pay stock dividends in the *Post-1990* sub-period, we find no evidence of comovement with the portfolio of dividend payers (see Model 2 in Table 3). We reach an identical inference when we use the regression specification in Eq. (5): Model 3 shows that the comovement of the return on CU's cash class (Series B) with the dividend portfolio returns significantly decreases when CU stopped paying cash dividends in the *Post-1990* sub-period; and we do not observe any significant change in the corresponding comovement for the stock-dividend class (Series A) in Model 4. Not surprisingly, the decrease in comovement of Series B shares is also higher relative to the change in comovement of A shares, with a difference-in-difference estimate of -4.27 (*t*= 2.11), as shown in Model 5.[11] Across all specifications, the findings are strongly supportive of our main hypothesis that return comovement is affected by dividend status of the stocks, beyond fundamental comovements.

2.5. Robustness tests

2.5.1. Alternative specifications: univariate regressions and unadjusted benchmark index returns

Given the concerns about bivariate regressions raised in Chen, Singal, and Whitelaw (2016), we implement univariate regressions. In particular, we estimate the coefficient for dividend and non-dividend index returns in separate regressions, while controlling for the Fama-French-Carhart risk factors in Eq. (1). Table 4, Panel A presents the baseline results using univariate regressions for the set of firms that initiated dividend payments. These firms experience an increase in comovement with other dividend payers, $\Delta\overline{\beta} = 0.28\ (t = 4.21)$ and a decrease in comovement with non-dividend payers, $\Delta\overline{\gamma} = -0.10\ (t = -3.35)$. We obtain a large net change in comovement betas (i.e., $\Delta\overline{\beta} - \Delta\overline{\gamma}$) of 0.38 (*t*=4.91) for dividend initiators. Panel B of Table 4 repeats the univariate regression for the matched firms and there is no change in the comovement coefficients for these control firms

[11] Although the estimate of comovement coefficients in Eqs. (4) and (5) are noisy in individual stock regressions, we confirm these findings using additional robustness tests. For example, we obtain similar results with: (a) controlling for the return on the portfolio of non-dividend payers; (b) using raw dividend portfolio returns instead of FFC adjusted excess returns; and (c) controlling for differential returns in the two classes on the ex-dividend days of A and B share classes (possibly related to tax effects) reported in Poterba (1986).

(similar to Table 1). The difference-in-difference tests for changes in return comovement across the dividend initiator relative to the control sample (i.e., $\left(\Delta\overline{\beta} - \Delta\overline{\beta_c}\right) - (\Delta\overline{\gamma} - \Delta\overline{\gamma_c})$) yields a huge increase in return comovement of dividend initiators at 0.42% (t=3.82) (see Panel C). Hence, the univariate regressions confirm that the change in return comovement for dividend initiators is robust to alternative regression specifications.

Unlike our previous indexes whose returns are adjusted for common risk factors, Panels D to F of Table 4 present the results when we use unadjusted (i.e., unadjusted for FFC factors) returns of dividend and non-dividend benchmark portfolios in the regressions in Eq. (1). Again, changing the way we construct the benchmark index returns does not affect our main findings. We obtain that the dividend initiators exhibit a significant increase in correlations with other dividend payers, with a net change in comovement betas (i.e., $\Delta\overline{\beta} - \Delta\overline{\gamma}$) of 0.17 ($t$=4.02) (see Panel D). Similar to our earlier findings, the control firms in Panel E do not exhibit any change in return comovement. The relative change in comovement between the dividend-initiating firms and the control firms $\left(\Delta\overline{\beta} - \Delta\overline{\beta_c}\right) - (\Delta\overline{\gamma} - \Delta\overline{\gamma_c})$, is a significant 0.133, as shown in Panel F, Table 4.

2.5.2. Does return comovement change when there are no dividend initiations?

We introduce a set of tests based on stocks for which there is no dividend initiation. We do this by estimating the comovement measures for dividend initiators in k years after initiation and compare the coefficients with those in year t+k+1. Specifically, for a stock that initiated dividends in year t, we estimate Eq. (1) for these firms in year t+k and t+k+1. Since these firms initiated dividends in year t, we do not expect changes in return comovement for these firms in subsequent years (i.e., $\Delta\overline{\beta} - \Delta\overline{\gamma}$= 0) in year t+k, where we consider k=1, 3, or 5.

As shown in Table 5, Panel A1, the comovement estimates do not change when we compare one (k=1) and two years ahead of dividend initiations: $\Delta\overline{\beta}$ and $\Delta\overline{\gamma}$ estimates are both small and insignificant and the grand difference-in-difference, ($\Delta\overline{\beta} - \Delta\overline{\gamma}$), is 0.01 and is not distinguishable from zero. In Panels A2 and A3 of Table 5, we repeat the analysis with k=3 or 5 and find similar results: the stocks do not exhibit any change in comovement if the event year is not the year the firm starts paying dividends. Interestingly, the comovement of these firms with other dividend payers is higher in three to five years after initiations. The β estimate increases from around 0.3 after initiation to around 0.8, consistent with slow adjustment in the investor clientele and that the adjustment may take more than a year. More importantly, there is nothing mechanical about the estimation process that generates the changes in the coefficients.

2.5.3. Does return comovement change around stock repurchase initiations?

We extend our comovement analysis to stock repurchases as an alternate corporate pay-out event. Specifically, we study the effect of stock repurchase initiations on return comovement. If investors view repurchase as similar to dividend payment, then we would expect repurchase initiators to experience (decreases) increases in comovement with other (non-) dividend-paying stocks. On the other hand, if dividends represent a unique and salient characteristic that segregates investor clienteles, the repurchase initiations provide a placebo test for our study.

For each stock repurchase initiator firm *i* in year *t*, we report coefficients estimated from the regression in Eq. (1) based on daily returns in pre (year *t*-1) and post (year *t*+1) event periods, where stock *i* is excluded from the benchmark portfolios. Following Fama and French (2001), the repurchase for a firm in year *t* is measured as the change in common treasury stock from year *t*−1 to year *t* if the firm uses the treasury stock method for repurchases. If the firm uses the retirement method instead, which is inferred from zero treasury stocks in the current and prior years, we take repurchases for year *t* to be the difference between purchases and sales of common and preferred stock in year *t*. If either of these amounts is negative, we set repurchases to zero (see also Huang and Thakor, 2013).[12] Firms with repurchase initiation in year *t* refer to firms that do not repurchase in *t*-1, but repurchase in *t*.

Table 5 Panel B presents the results. We find no evidence of changes in return comovement around share repurchase initiations. The overall difference-in-difference estimate (i.e., ($\Delta\overline{\beta} - \Delta\overline{\gamma}$), is 0.002 and is insignificant (*t*=0.08). Hence, investors react to dividend initiation and repurchase initiation differently, where the latter event does not generate significant changes in return

[12] We obtain similar results if repurchase initiation is defined as the dollar value of repurchase exceeding 1% of the firm's market value, following Gong, Louis, and Sun (2008).

comovement. Overall, we find that dividend payment is a unique form of payout that demarcates investor clienteles and generates return comovement.

2.6. Exposure of the dividend stocks to common factors

In estimating the changes in return comovement in Eq. (1), we control for the factor loadings on the two benchmark portfolios and the dividend initiators in the background. Fama and French (1993) report that dividend payers and nonpayers have different loadings to the Fama-French common factors and that these differences in factor exposures partially explain the variation in the portfolio returns (see Fama and French, 1993, Table 11, pp. 50-51). In this sub-section, we report the factor loadings of the benchmark dividend (MKT_D) and non-dividend (MKT_{ND}) portfolios used in Eq. (1).[13] We also present the changes in the sensitivities to the Fama-French-Carhart as well as the dividend factors for firms that initiate dividends.

Table 6 Panel A presents the time-series average of factor loadings for the dividend and non-dividend portfolios as well as the differences between these two portfolios. The dividend payers are bigger firms with a lower loading on the size factor and the market factor than the nonpayers: the difference in the *SMB* (market) beta is 0.365 (0.034) and is significant. The higher *HML* loadings for the dividend payers (0.309) than nonpayers (0.113) suggest that dividend payers have bigger exposure to the value factor. These findings are similar to those reported in Fama and French (1993). Interestingly, we find that the zero-dividend portfolio has a higher intercept (alpha), of 0.089% and it is higher than the dividend portfolio by 0.055% per day or more than 1% per month.

We obtain similar results when we compare the loadings and the alpha of dividend initiators during the year before and after initiation. The sample of Table 6 Panel B consists of 1,427 dividend initiators (the same set of initiators as in Table 1) during the sample period 1981–2012. In Panel B of Table 6, the average loadings on market and *SMB* factors are significantly lower after initiation. The change in *HML* loadings is negative but insignificant. The loadings on the momentum factor, on the

[13] The factor loadings come from averaging the coefficients from the regression of daily portfolio returns on the Fama-French-Carhart four factors each year: $MKT_{j,d} = \alpha_j + b_{MKT,j}MKTRF_d + b_{SMB,j}SMB_{d,} + b_{HML,j}HML_d + b_{UMD,j}UMD_{d,} + MKT_{j_{RES},d}$, where $j = D$ (dividend benchmark portfolio or $MKT_{DRES,d}$) or *ND* (nonpayer benchmark portfolio or $MKT_{NDRES,d}$) are as independent variables in Eq. (1).

other hand, do not change in either panel of Table 6. In addition to the changes in the exposure of dividend initiators to the Fama-French factors, dividend initiators pick up additional comovement with other dividend payers. The average increase in the exposure of dividend initiators to other dividend payers is a significant 0.22 (t=3.29). Since it is reasonable to expect investors to shift their understanding of the fundamentals of the firm when there is a change in the dividend status, our finding is consistent with the dividend clientele being partly related to investor risk preferences. Similar to the portfolio regressions in Panel A of Table 6, the regression intercept in Panel B decreases significantly when firms initiate dividends. Thus, the lower expected returns for the dividend payers cannot be explained by the tax disadvantage of dividends. During our sample period, investors exhibit a preference for dividends and demand a premium for holding non-dividend payers.[14] More importantly, the evidence in this subsection indicates that the changes in return comovement are related to dividend clientele that goes beyond the associated changes in the exposure to Fama-French factors.

[14] We also find that a huge portion of higher expected returns on the firms that do not pay dividends occurs in January. For instance, the average regression intercept for non-dividend payer benchmark portfolio is 0.261 in January, and is significantly higher than the non-January average of 0.073. We do not find evidence of a January effect in the returns on the dividend-payer portfolio. We reach an identical conclusion when we compare the January and non-January returns of the dividend initiators in Panel B of Table 6.

2.7. Comovement in turnover

If investors trade dividend stocks and non-dividend stocks as a category, it also implies common movements in the trading activity of the stocks within each category. This implication is not tested in previous studies, which we undertake in this subsection. Specifically, we examine whether there are changes in commonality in trading activity of stocks that initiate dividends with other dividend payers (and nonpayers). Similar to the analyses of return comovement in Table 1, we compare the changes in commonality in trading of dividend initiators with our control sample of characteristics-matched firms.

Lo and Wang (2000) and Cremers and Mei (2007) use turnover as a measure of trading activity and identify common factors in the turnover of individual stocks. As turnover is a non-stationary variable, we follow Lo and Wang (2000) by measuring turnover in logs and detrend the series with a 100-day moving average. We also add a constant (one) to avoid taking logarithm of zero trading volume. We use the approach in Karolyi, Lee, and van Dijk (2012) to measure daily turnover of stock *i* on day *d*, $Turn_{i,d}$:

$$Turn_{i,d} = \log\left(1 + \frac{VO_{i,d}}{NSH_{i,y}}\right) - \frac{1}{N}\sum_{k=1}^{100} \log\left(1 + \frac{VO_{i,d-k}}{NSH_{i,y}}\right), \tag{6}$$

where $VO_{i,d}$ is the trading volume of stock *i* on day *d* and $NSH_{i,y}$ is the number of shares outstanding at the beginning of year y. We proceed to filter out the effects of returns on turnover by regressing $Turn_{i,d}$ on (absolute) returns on stock *i* and the market returns within each month:

$$Turn_{i,d} = \alpha_i + \psi_i|R_{i,d-1}| + \upsilon_i|R_{m,d-1}| + \rho_i|R_{i,d}| + \pi_i|R_{m,d}| + \gamma_i * \sum_{\tau=1}^{4} D_\tau + RTurn_{i,d}, \tag{7}$$

where $R_{i,d}$ is the return on stock *i* on day *d*, $R_{m,d}$ is the return on the market index, and $|\cdot|$ indicates absolute values. We add day-of-the-week dummies D_τ, $(\tau = 1, \dots, 5)$, to account for seasonal variations in turnover. $RTurn_{i,d}$ in Eq. (7) represents the residual turnover series after removing the influence of returns on trading volume and seasonality in turnover.

Turnover comovement refers to the extent to which a firm's daily residual turnover covaries with the (equal-weighted) residual turnover of the index of dividend- and non-dividend paying stocks.

Similar to the return comovement model in Eq. (1), we run the following regression to estimate comovement in turnover for each dividend initiator:

$$RTurn_{i,d} = \alpha_i + \sum_{\tau=-1}^{1} \beta_{i,\tau}^{T} * RTurn_{D_{RES,d+\tau}} + \sum_{\tau=-1}^{1} \gamma_{i,\tau}^{T} * RTurn_{ND_{RES,d+\tau}} + \varepsilon_{i,d}, \quad (8)$$

where $RTurn_{D_{RES,d}}$ ($RTurn_{ND_{RES,d}}$) is the equal-weighted average of daily residual turnover of dividend (non-dividend) stocks on day *d*. We estimate model (8) during the year before (*Pre*) and after (*Post*) dividend initiation separately and aggregate the daily regression coefficients corresponding to days -1, 0, and +1:

$$\beta^{T} = \sum_{i \in Initiators} \beta_{i,-1}^{T} + \beta_{i,0}^{T} + \beta_{i,1}^{T} \quad (9)$$

$$\gamma^{T} = \sum_{i \in Initiators} \gamma_{i,-1}^{T} + \gamma_{i,0}^{T} + \gamma_{i,1}^{T}. \quad (10)$$

The corresponding regression coefficients for the control firms are denoted β_{C}^{T} and γ_{C}^{T}, respectively. As before, all dividend initiators and control firms are excluded from the two indexes in Eq. (8).

Panel A of Table 7 shows that the dividend-initiator stocks register an increase in comovement in stock turnover with other dividend-paying stocks, with β^{T} increasing from 0.47 to 0.56, and the change in comovement is significant, $\Delta\beta^{T} = 0.09$ (*t*=2.11). There is also a simultaneous decrease in comovement in turnover with non-dividend paying stocks, decreasing from 0.56 to 0.44, and, $\Delta\gamma^{T} = -0.12$ is significant. The difference-in-difference results, $\Delta\beta^{T} - \Delta\gamma^{T} = 0.21$ (*t*=2.5), show that there is a large change in comovement in trading activities around the dividend-initiation event.

On the other hand, firms in the control sample do not exhibit similar patterns of turnover comovement (see Panel B of Table 7). These firms have higher comovement with non-dividend paying stocks in both the pre- and post-event windows. We fail to find evidence of significant changes in the comovement of these control firms with other dividend-paying stocks (i.e., $\Delta\beta_{C}^{T} = -0.04$ ($t = -0.92$) or other non-dividend paying stocks, $\Delta\gamma_{C}^{T} = 0.05$ ($t = 1.03$). The difference-in-difference results in Panel B confirm that there is no significant change in comovement measures for the control sample, i.e., $\Delta\beta_{C}^{T} - \Delta\gamma_{C}^{T} = -0.10$ (*t*=-1.03).

Panel C of Table 7 presents the relative changes in comovement in turnover between the dividend initiators and control firms. These estimates confirm that the change in comovement of turnover of the dividend initiators is significantly different from those of the control firms. For example, the grand difference-in-difference in the estimated coefficients, i.e., $(\Delta\beta^T - \Delta\beta_C^T) - (\Delta\gamma^T - \Delta\gamma_C^T)$, is positive 0.31 and is significant, with t=2.43. As expected, the difference in the turnover comovement between the dividend initiators and the control group comes from the post-dividend-initiation period. Hence, the change in the turnover comovement when firms start paying dividends provides complementary evidence in favour of dividend clientele and their trading activities as a source of comovement.

3. Dividend clientele and return comovement: evidence from mutual funds

In this section, we explore a specific mechanism that could explain the changes in return comovement around dividend initiations, namely, the return comovement induced by flows to funds that have a preference for dividends. To do this, we extract the quarterly mutual fund holdings for all U.S. equity mutual funds from Thomson Reuters CDA/Spectrum database. Fund flows are constructed from a sample of actively managed domestic equity funds from the CRSP survivorship-bias-free mutual fund database. Our sample covers all U.S. equity funds that invest at least 50% of the assets under management in stocks. We use the MFLINKS database to aggregate share-class-level observations from the CRSP mutual fund database to the fund level. The sample period is from 1983 to 2012 except for the analyses using monthly fund flows, which are based on a shorter sample period starting in 1991 when monthly flow data became available.

3.1. Changes in mutual fund holdings

The clientele view of return comovement relies on investor preferences for specific stock characteristics such as dividends. To establish a link between investor habitat and the changes in return comovement around dividend initiation, we examine the changes in the mutual fund holdings of stocks that initiate dividends. If mutual funds that prefer dividends trade in dividend payers in a similar fashion, this would create demand shocks as they buy or sell the same assets in tandem. To measure mutual funds' relative preference for dividends, we use the historical dividend yield on the stocks owned by the funds. For each fund *f* in year *t*, we calculate the average dividend yield across all stocks held by the fund, $DivYld_{f,t}$,

$$DivYld_{f,t} = \sum_{i \in \emptyset_{f,t}} w_{i,f,t} * DivYld_{i,t-1}, \tag{11}$$

where $w_{i,f,t}$ is the investment weight of stock *i* held by fund *f* in year *t*; $DivYld_{i,t}$ is the dividend yield on stock *i*, and $\emptyset_{f,t}$ is the set of stocks held by fund *f* in year *t*.[15] We include dividend nonpayers (i.e., zero-dividend firms) in the calculation in Eq. (11). Next, all funds are ranked from the highest to lowest $DivYld_{f,t}$ to form quintiles. A *HIGH_DIVYLD* (*LOW_DIVYLD*) quintile contains funds that hold relatively high (low) dividend-paying stocks and hence have a revealed preference (aversion) for dividends.

We are interested in examining how mutual funds change their holdings in stocks that initiate dividends, and if the response of these funds depends on whether the fund is in the *HIGH_DIVYLD* or *LOW_DIVYLD* quintile. If firm *i* initiates dividend payment in year *t*, we compute the change in investment holdings of fund *f* ($\Delta w_{i,f,t+1}$) from the period before the initiation to the post-initiation year (i.e., $\Delta w_{i,f,t+1} = w_{i,f,t+1} - w_{i,f,t}$), and we aggregate the change in investment weights across all dividend initiators in year *t*.

Table 8, Panel A presents the changes in holdings of dividend initiators for funds sorted into quintiles based on $DivYld_{f,t}$. We find that funds in the *LOW_DIVYLD* quintile hold about 2.9% of the dividend initiators in the year prior to dividend initiation, which decreases to 2.6% the following year. Thus, funds that are averse to dividend stocks significantly decrease their investment by 0.33% (*t*=-5.9) in stocks that switch to paying dividends. Across the quintiles in Panel A, we find a monotonic increase in the holdings of dividends initiators by funds that exhibit stronger preference for dividends. Funds in the *HIGH_DIVYLD* quintile significantly increase their average investment in the dividend initiators from 0.73% in the year prior to the initiation to 0.99% after the firms initiate dividends. The difference-in-difference test between the *HIGH_DIVYLD* and *LOW_DIVYLD* fund quintiles confirms the differential reaction of investors in these extreme groups. Hence, dividend initiators attract capital

[15] The investment weight in year *t* is measured at the end of the first quarter of year *t*. We also consider measuring the investment weight based on holdings in the last quarter of year *t*-1, and obtain similar results.

from mutual funds that have a strong preference for dividends, providing fresh evidence of changes in institutional investor clientele around dividend initiations.

It should be noted that the *LOW_DIVYLD* funds have relatively weak preference for dividends. The performance of equity funds is typically judged relative to their benchmark portfolio and hence the funds may not be able to completely avoid dividend stocks, even for funds that follow an anti-dividend investment strategy. In unreported analysis, we examine the behaviour of funds that report zero $DivYld_{f,t}$, noting that these funds account for only 3% of the fund-year observations in the 1980–2012 sample. We find that these zero-dividend funds hold about 5.2% of the dividend initiators in the year prior to dividend initiation, which decreases by a significant 1.2% (t=3.2) in the following year. This provides complementary evidence that anti-dividend clientele respond to dividend payout decisions, although they make up a small proportion of the population of mutual funds. Overall, there is a significant change in the funds' holding of the stocks that initiate dividends, depending on their preference for dividends.

As institutional participation in the equity market has increased over time, it would be interesting to see if the effect of dividend initiation on the investor base is also present in the recent period. Panel B of Table 8 presents the changes in institutional holdings across three ten-year sub-periods: 1983–1992, 1993–2002, and 2003–2012. We find persistent evidence that funds with the highest preference for dividends increase their portfolio weights around dividend initiations in each of the three sub-periods. The difference-in-difference between funds with the highest and lowest quintile in terms of their preference for dividends is positive in all sub-periods, with the magnitude of change being strongest at 0.93% in the 2003–2012 sub-period. The larger changes in fund holdings in response to dividend initiations in more recent years is also consistent with greater specialization in trading styles of mutual funds as well as other asset management institutions (e.g., Harris, Hartzmark, and Solomon, 2015). The evidence supports the notion that changes in mutual-fund-based dividend clientele (and possibly changes in their trading patterns) generate excess return comovement between dividend initiators and other dividend-paying stocks.

We also repeat the analyses on the changes in mutual fund holdings around dividend initiations in the setting of the 2003 Tax Cut and obtain similar evidence. In unreported results, we find that

HIGH_DIVYLD funds increase their holdings of dividend initiators by 0.20% (from 0.49% to 0.69%) in the year after the 2003 Tax Cut, while *LOW_DIVYLD* funds reduce their holdings of these stocks by 0.44%, generating a net change of 0.64% in share ownership. The estimates based on the 2003 Tax Cut are slightly stronger than those reported for the full sample in Table 8. We also find, though this is not reported, that the Equity Income Funds defined by Lipper (see Fig. 1) display an increase in their holdings of dividend initiators in both the overall sample and around the 2003 Tax Cut.[16]

3.2. Fund flows and comovement

Since stocks that pay dividends attract mutual funds that favour dividends, we explore whether prices of dividend payers are unconditionally more exposed to the capital flows to these dividend-prone funds. Similarly, we examine whether stock prices of nonpayers are more (less) exposed to flows to dividend-averse (dividend-prone) funds. We do this by classifying all mutual funds into two groups in each quarter: dividend-prone funds (and dividend-averse funds) if the investment value-weighted dividend yield of stocks held by fund *f*, in quarter *q*, $DivYld_{f,q}$, is above the median. The net flow to fund *f* during month *m* ($Flows_{f,m}$) is defined as:

$$Flows_{f,m} = \frac{TNA_{f,m} - TNA_{f,m-1}(1 + R_{f,m}) - MergeTNA_{f,m}}{TNA_{f,m-1}}, \tag{12}$$

where $TNA_{f,m}$ is the total net asset (TNA) at the end of month *m*, $R_{f,m}$ is the fund's return for month *m*, and $MergeTNA_{f,m}$ is the increase in the TNA due to mergers during month *m*. Next, we construct two stock-level flow-induced trading measures similar to Lou (2012). For stock *i* and fund *f* in month *m*, we define the stock-level flow-induced trading by dividend-prone funds, $FIT\_DP_{i.m}$, as:

$$FIT\_DP_{i,m} = \sum_{f \in Dividend\ Prone\ Funds} Flows_{f,m} * \frac{Shares_{f,i,m}}{\sum_{f \in all\ funds} Shares_{f,i,m}}, \tag{13}$$

[16] Analyses of changes in holdings of high- and low-dividend funds in the setting of Citizens Utilities (CU) is not reported as we find that the coverage of mutual fund holdings of CU is sparse in the mutual fund database, especially in the pre-1990 period. However, using all institutional investors in the 13F database, we find some evidence that high-dividend institutional investors significantly decrease their holding of the cash class of CU from 7% (as a percentage of outstanding shares of CU cash class) in the 1985–1990 sub-period to 2% in the 1991–1995 sub-period. For the share dividend class of CU, the holdings of high-dividend yield institutional investors goes from 0.6% to 1.8% in the pre and post 1990 sub-periods. The net difference-in-difference holdings across the two classes in the pre and post 1990 sub-periods is -6.2% (*t*-stat=5.55), consistent with institutions that prefer dividends tilting their holdings away from the cash class when CU switches its payout method from cash to stock dividends.

where $Shares_{f,i,m}$ is the number of shares of stock *i* held by fund *f* (since fund holdings are reported quarterly, we use the latest quarterly reports to infer a fund's holding in month *m*). The corresponding measure for dividend-averse funds, $FIT\_DA_{i,m}$, uses flows for all dividend-averse funds that hold the stock:

$$FIT\_DA_{i,m} = \sum_{f \in Dividend\ Averse\ Funds} Flows_{f,t} * \frac{Shares_{f,i,m}}{\sum_{f \in all\ funds} Shares_{f,i,m}}, \quad (14)$$

$Flows_{f,m}$ is the monthly flow for fund *f* in month *m*.

Higher *FIT_DP* (*FIT_DA*) implies that dividend-prone (dividend-averse) mutual funds holding the stock experience higher inflows. Under our maintained hypothesis that clientele-based capital flows affect the movement in the prices of stock they trade, we expect *FIT_DP* (*FIT_DA*) to have a bigger (smaller) influence on the returns on dividend-paying stocks as dividend-prone funds reallocate capital flows among dividend stocks. Thus, flows to dividend-prone (dividend-averse) funds are expected to be positively correlated with returns on dividend payers (nonpayers).

Table 9 reports the regression of monthly stock returns on mutual funds flow-induced trading for dividend-paying stocks in years *t* and *t*+1. For each dividend payer, we regress the monthly stock returns in years *t*+1 to *t*+2 on the monthly flow-induced trading measures ($FIT\_DP_{i,m}$ and $FIT\_DA_{i,m}$). We require that there are 24 monthly observations. The control variables include Fama-French-Carhart (FFC) risk factors (MKT, SMB, HML, UMD), as well as comovement due to industry factors: $R_{IND,m}$, the value-weighted monthly industry returns where industries are defined by the Fama-French classification of 48 industries; $R_{INDi\text{-}D,m}$ ($R_{INDi\text{-}ND,,m}$), the value-weighted returns of all dividend payers (non-dividend payers) in stock *i*'s industry. In constructing the industry portfolio returns, we exclude firm *i* from the industry portfolio that it belongs to, and use portfolio returns orthogonal to the FFC four risk factors. Finally, we consider lagged values of *FIT_DP* and *FIT_DA* as additional independent variables. Each year, we obtain the cross-sectional average of the regression coefficients for all dividend stocks as well as non-dividend stocks.

As shown in Panel A of Table 9, we find that stock returns for dividend-paying stocks are positively and significantly associated with contemporaneous flow-induced trading of dividend-prone funds. The coefficient for *FIT_DP* is 0.18 (t=2.87) in Column 3, after controlling for common factors as well as fundamental drivers of returns within an industry. In contrast, the fund-flow-induced trading by dividend-averse funds (*FIT_DA*) does not affect returns on dividend-payers in all specifications. We repeat the analysis for the set of zero-dividend stocks. In Panel B of Table 9, we find that stock returns of non-dividend-paying stocks are affected by the flows to dividend-averse funds (*FIT_DA*) but not *FIT_DP*. Hence, dividend-paying (zero-dividend) stocks are exposed to the fund flow risk associated with funds that have a preference to invest in dividend- (non-dividend) paying stocks, consistent with the dividend-clientele hypothesis.

3.3. Mutual fund flows and dividend premium

In this subsection, we explore how capital flows to dividend-prone and dividend-averse funds vary with investor appetite for dividends. We group funds into *HIGH_DIVYLD* and *LOW_DIVYLD* quintiles based on the fund-level dividend yield measure in Eq. (11). Funds in the *HIGH_DIVYLD* and *LOW_DIVYLD* quintiles are represented by indicator variables *D(HIGH_DIVYLD)* and *D(LOW_DIVYLD)* which equal one if a fund's investment-weighted average dividend yield of stocks in the fund ranks in the top and bottom quintiles, respectively, and zero otherwise. To examine the time-series relation between fund flows to each group of funds and the aggregate investor preference for dividends, we use the dividend premium measure in Baker and Wurgler (2004).[17] This is motivated by the ideas in Baker and Wurgler (2004), who argue that investor preference for dividend-paying stocks varies over time and this demand for dividends is reflected in the dividend premium, which is the difference between the valuations of dividend payers and nonpayers. Baker and Wurgler (2004) find that the dividend premium is high when the investor sentiment towards dividends is positive, and firms cater to the demand with a greater aggregate rate of dividend initiations. Moreover, Stambaugh, Yu, and Yuan (2012) show that proxies for investor sentiment are more useful in predicting time-variation in the cross-section of expected returns during periods of high sentiment.

[17] We thank Jeffrey Wurgler for making the data available at http://people.stern.nyu.edu/jwurgler/.

Hence, we expect flows to *HIGH_DIVYLD* (*LOW_DIVYLD*) funds to be positively (negatively) related to dividend premium.

We control for fund characteristics that have been shown to explain cross-sectional variation in flows to funds. These lagged fund characteristics include: *log*(*TNA*), the fund's total net asset value; *Fund return,* the return on the fund; *log(Age),* the number of years since the inception of the fund's oldest share class; *Expenses,* the fund's expense ratio; *Total load,* the fund's total load fees; and *Turnover,* the portfolio turnover rate. We use lagged TNA of each share class as weight to aggregate expenses, total load, and turnover measures at a fund level. We also control for the contemporaneous *Flow style*, the average net flows to mutual funds with the same investment objective (e.g., see Franzoni and Schmalz, 2017).

Table 10 presents the results. We find that in periods with a stronger appetite for dividends, *HIGH_DIVYLD* funds experience larger inflows while *LOW_DIVYLD* funds experience outflows. The effect of dividend premium on flows is economically significant. Beyond the interaction term of *HIGH_DIVYLD* dummy and dividend premium, all the estimated coefficients associated with fund characteristics are consistent with findings in prior literature. When we add controls for fund fixed effects in Column 2 of Table 10, our main results are unaffected, suggesting that our findings are not driven by time-invariant omitted variables specific to the funds. Specifically, we find that a one standard derivation increase in the dividend premium is associated with 4.4% higher inflows per annum for funds in the top quintile in terms of preference for dividends. The annual impact on flows is computed as 0.038 x 9.6% x 12 (=4.4%) where 0.038 is the regression coefficient (Column 2 of Table 10) and 9.6% is the standard deviation of the dividend premium. In Column 3 of Table 10, we find that a one standard derivation increase in the dividend premium is associated with 4.1% lower inflows per annum for funds in the *LOW_DIVYLD* quintile. We obtain similar findings when we run the regressions including interactions of dividend premium with indicator variables for both *HIGH_DIVYLD* and *LOW_DIVYLD* in Column 4. Table 10 is implemented with monthly fund flows, but results are similar when the analysis is based on flows measured at quarterly intervals in unreported analysis. Overall, the evidence strongly indicates that as investor appetite shifts toward a preference for dividends, capital flows in (out) of mutual funds that load heavily (lightly) on dividend-paying stocks. Hence, the movements of capital induced by the time-varying preference for dividends supports our contention that dividend is a salient stock characteristic affecting the investment style-based comovement in stock returns.

4. Conclusion

We provide new evidence in support of the proposition that the trading activities of dividend clienteles induce an extra factor in dividend payers. The dividend clientele may be based on investor tax status, income and risk preferences, investor sentiment towards dividends, or other cognitive biases. At the margin, initiations of dividend payments affect the corporation's investor clientele, attracting investors with a preference for dividend stocks. These stocks display a significant shift in their return comovement: they exhibit stronger (weaker) return comovement with other dividend-paying (non-paying) stocks. Our evidence of a dividend-clientele-induced return comovement is robust to a battery of tests that control for variation in firm fundamentals and exposure to common risk factors. We find confirming evidence using two additional settings. First, using the 2003 dividend tax cut as an exogenous trigger for dividend initiations (Chetty and Saez, 2005), we show that firms that initiate dividends following the tax cut comove significantly more (less) with other dividend payers (nonpayers). Second, we exploit the unique two-class stock structure of the Citizens Utilities Company where the two classes are identical, except that one class of stocks pays cash dividends and the other pays an equivalent amount in stock dividends. Again, we find that the returns on the cash-dividend class comove more with other cash-dividend payers. We also find that dividend initiators exhibit an increase in turnover comovement with other dividend-paying stocks. Finally, we demonstrate that mutual funds that have a higher (lower) propensity to hold dividend-paying stocks receive more inflows when the investor preference for dividends is stronger (weaker). Overall, our results are consistent with the view that dividend is a salient characteristic that investors use to trade as a category, and investors trading in and out of this category induce comovement in returns.

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Fig. 1: Asset under Management by Equity Income Funds (Lipper)

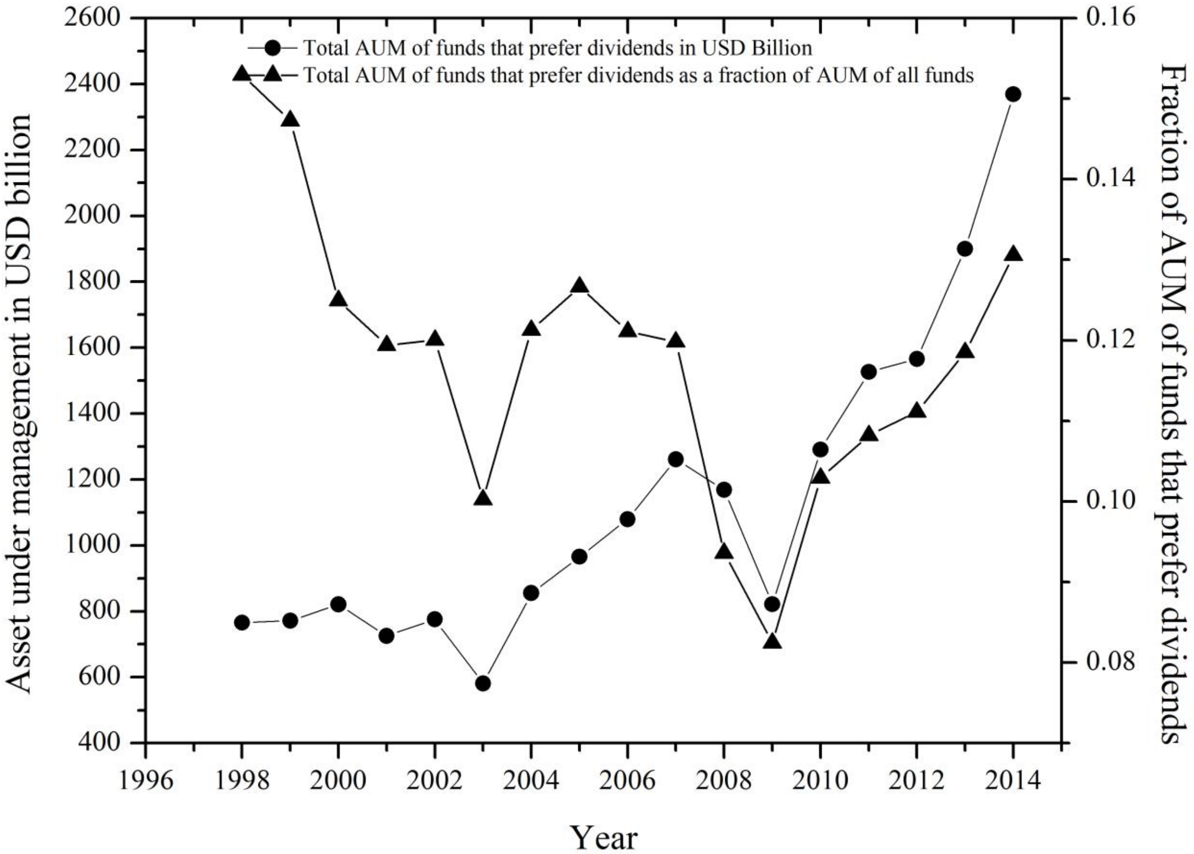

Table 1

Dividend initiation and return comovement

This table presents the estimates of the following return regressions:

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RES},d} + \gamma_i * MKT_{ND_{RES},d} + \delta * X + \varepsilon_{i,d},$$
$$Ret_{c,d} = \alpha_c + \beta_c * MKT_{D_{RES},d} + \gamma_c * MKT_{ND_{RES},d} + \delta_c * X_d + \varepsilon_{c,d},$$

where $Ret_{i,d}$ ($Ret_{c,d}$) is the return on dividend initiator *i* (the control firm *c*) on day *d*; $MKT_{D_{RES},d}$ and $MKT_{ND_{RES},d}$ refer to returns on the benchmark portfolios of dividend payers and nonpayers, respectively. These benchmark portfolio returns are residuals after accounting for their dependence on the Fama-French-Carhart (FFC) four-factor model. The vector X refers to returns on the four FFC factors (market excess returns, SMB, HML, and Momentum). The control firm for each dividend initiator is obtained using the propensity-score-matching approach based on the following characteristics: *log (Total asset), Market/book ratio* (the ratio of market-to-book value of equity), *Stock return in prior one year* (cumulative stock returns in the past year), *Idiosyncratic volatility* (the standard deviation of residuals estimated from a market model using daily returns in the past year), *Leverage*(the ratio of long-term debt to total assets), and *ROA*(ratio of operating income before depreciation to total assets). Panel A reports the mean and median characteristics of dividend initiators and control firms. Panels B to D show the return comovement with the dividend (β) and non-dividend (γ) benchmark portfolios for the dividend initiators and control firms and the difference between the two groups. For firms that initiate dividends in year *t*, the pre-event period (PRE) and the post-event period (POST) refer to the years *t*-1 and *t*+1, respectively. The column POST-PRE reports the difference in mean coefficient values in the POST and PRE periods. The sample consists of 1,427 dividend initiators and an equal number of control firms during the sample period 1981–2012.

Panel A: Firm characteristics

Characteristics	Dividend initiators		Control firms		Difference in mean [(a)-(b)]	*t*-value
	Mean (a)	Median	Mean (b)	Median		
log(Total asset)	5.507	5.406	5.501	5.512	0.006	0.09
Market/book ratio	2.101	0.146	2.196	0.202	-0.095	-1.35
Past 1-year stock return	0.222	0.113	0.23	0.071	-0.008	-0.38
Idiosyncratic volatility	0.030	0.026	0.031	0.027	-0.001	-1.94
Leverage	0.158	0.101	0.164	0.108	-0.006	-0.93
ROA	0.116	0.112	0.112	0.112	0.004	1.06

Panel B: Comovement of dividend initiators

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.161	3.08	0.382	8.12	0.221	3.29
γ_i	0.299	12.67	0.223	9.99	-0.077	-2.62
$\beta_i - \gamma_i$	-0.138	-2.50	0.160	3.20	0.298	4.26

Panel C: Comovement of control firms

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_c	0.126	2.30	0.071	1.30	-0.054	-0.78
γ_c	0.320	13.07	0.347	13.35	0.027	0.85
$\beta_c - \gamma_c$	-0.194	-3.36	-0.275	-4.73	-0.081	-1.10

Panel D: Difference in comovement of dividend initiators and control firms

	PRE (Initiator - Control)		POST (Initiator - Control)		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
$\beta_i - \beta_c$	0.036	0.49	0.311	4.41	0.276	2.87
$\gamma_i - \gamma_c$	-0.020	-0.67	-0.124	-3.82	-0.104	-2.44
$(\beta_i - \beta_c) - (\gamma_i - \gamma_c)$	0.056	0.75	0.435	5.90	0.379	3.83

Table 2

Dividend initiation and return comovement: the 2003 tax cut evidence

This table presents return comovement for firms that initiated dividends immediately after the enactment of the 2003 Tax Cut Act in May 2003. Control firms for each initiator are obtained using the propensity-score-matching approach from the list of firms that already pay dividends prior to 2003. We require that the dividend initiators and control firms are similar in terms of these characteristics (in 2002): *log (Total asset), Market/book ratio, Stock return in prior one year, Idiosyncratic volatility*, *Leverage*, and *Return on asset (ROA)*. Please refer to Table 1 for definitions of these variables. Panel A reports the mean and median characteristics of dividend initiators and the control firms. Panels B to D present the estimates of the following return regressions:

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RES},d} + \gamma_i * MKT_{ND_{RES},d} + \delta * X + \varepsilon_{i,d},$$
$$Ret_{c,d} = \alpha_c + \beta_c * MKT_{D_{RES,d}} + \gamma_c * MKT_{ND_{RES,d}} + \delta_c * X_d + \varepsilon_{c,d},$$

where $Ret_{i,d}$ ($Ret_{c,d}$) is the return on dividend initiator *i* (the control firm *c*) on day *d*; $MKT_{D_{RES,d}}$ and $MKT_{ND_{RES},d}$ refer to returns on the benchmark portfolio of dividend payers and nonpayers, respectively. These benchmark portfolio returns are residuals after accounting for their dependence on the Fama-French-Carhart (FFC) four-factor model. The vector X refers to returns on the four FFC factors (market excess returns, SMB, HML, and Momentum factors). The pre-event period (PRE) and the post-event period (POST) span from April 2002 to March 2003 and from April 2004 to March 2005, respectively. There are 138 dividend initiators and 138 control firms in the final sample.

Panel A: Firm characteristics

Characteristics	Dividend initiators Mean (a)	Dividend initiators Median	Control firms Mean (b)	Control firms Median	Difference in mean [(a)-(b)]	*t*-value
log(Total asset)	6.215	6.025	6.277	6.239	-0.062	-0.29
Market/book ratio	1.860	1.424	1.897	1.471	-0.037	-0.24
Past 1-year stock return	0.004	-0.042	0.006	-0.016	-0.002	-0.07
Idiosyncratic volatility	0.025	0.024	0.025	0.024	0.000	-0.05
Leverage	0.126	0.073	0.136	0.132	-0.01	-0.60
ROA	0.121	0.119	0.123	0.11	-0.002	-0.13

Panel B: Comovement of dividend initiators

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.029	0.25	0.583	4.60	0.554	3.63
γ_i	0.295	5.12	0.312	4.90	0.018	0.26
$\beta_i - \gamma_i$	-0.266	-2.30	0.271	2.15	0.537	3.52

Panel C: Comovement of control firms

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_c	0.835	6.89	0.595	4.72	-0.240	-1.35
γ_c	0.360	6.98	0.110	1.82	-0.250	-3.51
$\beta_c - \gamma_c$	0.475	3.68	0.485	3.92	0.010	0.06

Panel D: Difference in comovement of dividend initiators and control firms

	PRE (Initiator - Control)		POST (Initiator - Control)		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
$\beta_i - \beta_c$	-0.806	-4.61	-0.011	-0.07	0.795	3.37
$\gamma_i - \gamma_c$	-0.065	-0.84	0.203	2.56	0.268	2.71
$(\beta_i - \beta_c) - (\gamma_i - \gamma_c)$	-0.741	-4.15	-0.214	-1.31	0.527	2.42

Table 3

Cash and stock classes of Citizens Utilities: a natural experiment

This table presents return comovement of two classes of the Citizens Utilities (CU) Company. CU had a dual class structure where Series A shares receive tax-deferred stock dividends, while Series B paid cash dividends of equal fair market value. In 1990, when the special status for CU dual class shares expired, CU terminated cash dividends on its Series B shares and started paying the same stock dividends on both A and B shares. In Panel A, we present descriptive statistics of the returns of Series A and B shares over two sub-periods: the *Pre-1990* period (1984–1988) and the *Post-1990* period (1991–1995). R_A (R_B) refers to average daily returns on Series A (B) in percentage points. *CORR(*Ret_A, Ret_B) is the correlation of daily returns on Series A and B. We calculate the standard deviation of daily returns within each month for each Series (i.e., STD(R_A) and STD(R_B)) and report the time-series average of these standard deviations. Panel B presents the estimates of the following regression:

$$R_{j,d} = \alpha_o + \alpha_1 D_B + \beta_A MKT_{DRES,d} + \beta_{B-A} MKT_{DRES,d} * D_B + \delta X_d + \epsilon_{j,d},$$

where $R_{j,d}$ is the return of CU stock on day *d*, and *j*=A or B class shares; D_B is a dummy variable that takes a value of one if stock *j* is Series B (cash dividend) and zero otherwise; the Fama-French-Carhart adjusted residual daily returns on the benchmark portfolio of dividend payers ($MKT_{DRES,d}$), and the vector of Fama-French-Carhart four factors (X_d) as defined in Table 1. Columns 1 and 2 present estimates of the above regression model over two sub-periods: *Pre-1990* and *Post-1990* sub-periods. In Columns 3 and 4, we present estimates of changes in the coefficient of comovement of $R_{j,d}$ for each class of shares (*j*=A or B), adding a dummy variable, D_{Post}, that is equal to one (zero) during the *Post-1990* (*Pre-1990*) sub-period:

$$R_{j,d} = \alpha_o + \alpha_1 D_{Post} + \beta_{Pre} MKT_{DRES,d} + \beta_{Post-Pre} MKT_{DRES,d} * D_{Post} + \delta X_d + \delta_{Post} X_d * D_{Post} + \epsilon_{j,d}.$$

Column 5 compares change in return comovement for A and B Series by estimating a regression with daily returns on both Series in both periods.

$$R_{j,d} = \alpha_o + \alpha_1 D_{Post} + \alpha_2 D_B + \beta\, MKT_{DRES,d} + \beta_B\, MKT_{DRES,d} * D_B + \beta_{Post}\, MKT_{DRES,d} * D_{Post} + \beta_3 D_B * D_{Post} + \beta_{B-A,Post-Pre} MKT_{DRES,d} * D_{Post} * D_B + \delta X_d + \delta_{Post} X_d * D_{Post} + \epsilon_{j,d.}$$

T-statistics are reported in the parentheses. ***, **, and * represent significance levels at 1%, 5%, and 10%, respectively.

Panel A: Summary statistics

	Pre-1990	*Post-1990*
R_A	0.111	0.071
R_B	0.122	0.070
$(R_B - R_A)$	-0.011	0.001
t-stat $(R_B - R_A)$	(-0.200)	(0.020)
$STD(R_A)$	1.533	1.490
$STD(R_B)$	1.682	1.500
$CORR(R_A, R_B)$	0.375	0.686

Panel B: Regression analysis

	(1)	(2)	(3)	(4)	(5)
Dep. var.=	Daily stock return ($R_{j,d}$)				
Sample used=	*Pre-1990, both series*	*Post-1990, both series*	*Both periods, series B*	*Both periods, series A*	*Both periods, both series*
$MKT_{DRES}*D_B$	3.824**	-0.444			3.824**
	(2.24)	(-0.40)			(2.31)
D_B	-0.011	0.001			-0.011
	(-0.17)	(0.01)			(-0.17)
$MKT_{DRES}*D_{Post}$			-2.531*	1.737	1.737
			(-1.74)	(1.25)	(1.22)
D_{Post}			-0.051	-0.058	-0.060
			(-0.77)	(-0.93)	(-0.95)
$MKT_{DRES}*D_B*D_{Post}$					-4.268**
					(-2.11)
D_B*D_{Post}					0.012
					(0.13)
MKT_{DRES}	-0.971	0.765	2.853**	-0.971	-0.971
	(-0.80)	(0.97)	(2.39)	(-0.85)	(-0.83)
MKTRF	0.688***	0.504***	0.635***	0.741***	0.688***
	(13.28)	(8.17)	(8.77)	(10.74)	(13.73)
SMB	0.475***	0.142*	0.536***	0.414***	0.475***
	(7.17)	(1.67)	(5.79)	(4.69)	(7.41)
HML	0.254**	0.084	0.386**	0.121	0.254**
	(2.24)	(0.85)	(2.44)	(0.80)	(2.32)
UMD	0.325***	0.118	0.096	0.553***	0.325***
	(4.16)	(1.44)	(0.88)	(5.32)	(4.30)
MKTRF*D_{Post}			-0.181	-0.187*	-0.184**
			(-1.55)	(-1.67)	(-2.27)
SMB*D_{Post}			-0.454***	-0.212	-0.333***
			(-2.88)	(-1.42)	(-3.06)
HML*D_{Post}			-0.286	-0.053	-0.170
			(-1.32)	(-0.26)	(-1.13)
UMD*D_{Post}			0.061	-0.475***	-0.207*

			(0.37)	(-3.04)	(-1.82)
Constant	0.098**	0.038	0.090*	0.094**	0.098**
	(2.11)	(0.86)	(1.96)	(2.15)	(2.18)
Observations	2,528	2,528	2,528	2,528	5,056
R-square	0.12	0.04	0.06	0.12	0.08

Table 4

Alternative regression specifications

This table presents the return comovement of dividend initiators using alternative regression specifications. Panels A, B, and C report the estimates of univariate regressions on dividend payer (or nonpayer) benchmark portfolios and the four risk factors (Market, SMB, HML, Momentum):

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RES,d}} + \delta * X + \varepsilon_{i,d},$$
$$Ret_{i,d} = \alpha_i + \gamma_i * MKT_{ND_{RES},d} + \delta * X + \varepsilon_{i,d},$$
$$Ret_{c,d} = \alpha_c + \beta_c * MKT_{D_{RES,d}} + \delta_c * X_d + \varepsilon_{c,d},$$
$$Ret_{c,d} = \alpha_c + \gamma_c * MKT_{ND_{RES,d}} + \delta_c * X_d + \varepsilon_{c,d},$$

where $Ret_{i,d}$ ($Ret_{c,d}$) is the return on dividend initiator *i* (the control firm *c*) on day *d*; $MKT_{D_{RES,d}}$ and $MKT_{ND_{RES},d}$ refer to returns on the benchmark portfolios of dividend payers and nonpayers, respectively. These portfolio returns are residuals after accounting for their dependence on the Fama-French-Carhart (FFC) four-factor model. The vector *X* refers to returns on the four FFC factors (market excess returns, SMB, HML, Momentum factors). The control firm for each dividend initiator is obtained using a propensity-score-matching approach matched on these characteristics: *log (Total asset)*, *Market/book ratio*, *Stock return in prior one year*, *Idiosyncratic risk*, *Leverage*, and *Return on asset (ROA)*. For firms that initiates dividends in year *t*, the pre-event period (PRE) and post-event period (POST) refers to years *t*-1 and *t*+1, respectively. The column POST-PRE reports the difference in mean coefficient values in the POST and the PRE periods. Panels D, E, and F present the estimates of the following univariate return regressions:

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RAW,d}} + \delta * X + \varepsilon_{i,d},$$
$$Ret_{i,d} = \alpha_i + \gamma_i * MKT_{ND_{RAW},d} + \delta * X + \varepsilon_{i,d},$$
$$Ret_{c,d} = \alpha_c + \beta_c * MKT_{D_{RAW,d}} + \delta_c * X_d + \varepsilon_{c,d},$$
$$Ret_{c,d} = \alpha_c + \gamma_c * MKT_{ND_{RAW,d}} + \delta_c * X_d + \varepsilon_{c,d},$$

where $MKT_{D_{RAW,d}}$ and $MKT_{ND_{RAW},d}$ refer to unadjusted returns on the benchmark portfolios of dividend payers and nonpayers, respectively.

Panel A: Univariate regressions: comovement of dividend initiators

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.035	0.67	0.316	6.71	0.281	4.21
γ_i	0.287	12.11	0.189	8.44	-0.098	-3.35
$\beta_i - \gamma_i$	-0.252	-4.03	0.127	2.29	0.379	4.91

Panel B: Univariate regressions: comovement of control firms

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_c	-0.014	-0.25	-0.027	-0.48	-0.013	-0.18
γ_c	0.306	12.52	0.334	12.76	0.027	0.86
$\beta_c - \gamma_c$	-0.320	-4.94	-0.360	-5.58	-0.040	-0.49

Panel C: Univariate regressions: comovement of dividend initiators - comovement of control firms

	PRE (Initiator - Control)		POST (Initiator - Control)		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
$\beta_i - \beta_c$	0.049	0.67	0.343	4.81	0.294	3.05
$\gamma_i - \gamma_c$	-0.019	0.00	-0.144	-4.46	-0.125	-2.96
$(\beta_i - \beta_c) - (\gamma_i - \gamma_c)$	0.068	0.82	0.487	5.98	0.419	3.82

Panel D: Unadjusted index returns: comovement of dividend initiators

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.464	20.78	0.547	25.78	0.084	3.40
γ_i	0.444	27.62	0.361	23.23	-0.083	-4.26
$\beta_i - \gamma_i$	0.020	0.56	0.187	5.53	0.167	4.02

Panel E: Unadjusted index returns: comovement of control firms

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_c	0.449	18.78	0.444	20.18	-0.005	-0.17
γ_c	0.550	30.85	0.512	28.40	-0.038	-1.76
$\beta_c - \gamma_c$	-0.101	-2.62	-0.067	-1.84	0.034	0.74

Panel F: Unadjusted index returns: comovement of dividend initiators - comovement of control firms

	PRE (Initiator - Control)		POST (Initiator - Control)		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
$\beta_i - \beta_c$	0.015	0.53	0.103	3.77	0.088	2.53
$\gamma_i - \gamma_c$	-0.106	-5.17	-0.151	-6.90	-0.045	-1.57
$(\beta_i - \beta_c) - (\gamma_i - \gamma_c)$	0.121	2.69	0.254	5.61	0.133	2.23

Table 5
Return comovement of dividend initiators in non-initiating years or when stock repurchases are initiated

Panel A presents the return comovement of dividend initiators with the benchmark portfolio of dividend payers and nonpayers in *non-initiating* years. For each dividend initiator in year *y*, we estimate the return comovement in year *y*+*k*:

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RES,d}} + \gamma_i * MKT_{ND_{RES},d} + \delta * X + \varepsilon_{i,t},$$

where $Ret_{i,d}$ is the return on dividend initiator *i* on day *d*; $MKT_{D_{RES,d}}$ and $MKT_{ND_{RES},d}$ refer to returns on the benchmark portfolios of dividend payers and nonpayers, respectively. These portfolio returns are residuals after accounting for their dependence on the Fama-French-Carhart (FFC) four-factor model. The vector X refers to returns on the four FFC factors (market excess returns, SMB, HML, and Momentum). For year *y*+*k*, the pre-event period (PRE) and the post-event period (POST) refer to year *y*+*k*-1 and year *y*+*k*+1, respectively. The column POST-PRE reports the difference in mean coefficient values in the POST and PRE periods. We consider *k*=1, 3, or 5 years.
Panel B presents the return comovement for firms that initiate stock repurchases. For each repurchase initiator in year *t*, we report coefficients estimated from the following regression:

$$Ret_{i,d} = \alpha_i + \beta_i * MKT_{D_{RES,d}} + \gamma_i * MKT_{ND_{RES,d}} + \delta * X + \varepsilon_{i,t}.$$

For firms that initiate stock repurchase in year *t*, the pre-event period (PRE) and the post-event period (POST) refer to year *t*-1 and *t*+1, respectively. The column POST-PRE reports the difference in mean coefficient values in the POST and PRE periods.

Panel A: Return comovement of dividend initiators in non-initiating years
Panel A1: Regressions around year y + 1

	PRE		POST		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.344	6.35	0.387	7.01	0.043	0.57
γ_i	0.226	9.36	0.255	10.55	0.029	0.94
$\beta_i - \gamma_i$	0.118	2.25	0.132	2.25	0.014	0.18

Panel A2: Regressions around year y + 3

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.814	12.12	0.906	12.09	0.092	0.97
γ_i	0.296	10.85	0.328	10.69	0.032	0.87
$\beta_i - \gamma_i$	0.517	7.47	0.578	7.71	0.061	0.64

Panel A3: Regressions around year y + 5

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.786	10.94	0.777	11.61	-0.009	-0.10
γ_i	0.351	10.26	0.314	8.55	-0.037	-0.86
$\beta_i - \gamma_i$	0.435	5.61	0.463	6.37	0.028	0.28

Panel B: Stock repurchase initiations and return comovement

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_i	0.381	23.24	0.356	22.55	-0.025	-1.18
γ_i	0.450	55.30	0.423	51.84	-0.027	-2.81

$\beta_i - \gamma_i$	-0.068	-3.77	-0.067	-3.72	0.002	0.08

Table 6

Factor loadings of dividend payers, nonpayers, and dividend initiators

This table presents exposure of the dividend stocks to common factors. Panel A presents the time-series average of factor loadings and the intercept (alpha, α) for the dividend (MKT_D) and non-dividend (MKT_{ND}) portfolios used in Table 1 as well as the differences between these two portfolios. The factor loadings come from averaging the coefficients from the regression of daily portfolio returns on the Fama-French-Carhart four factors each year:

$$MKT_{j,d} = \alpha_j + b_{MKT,j}MKTRF_d + b_{SMB,j}SMB_{d,} + b_{HML,j}HML_d + b_{UMD,j}UMD_{d,} + MKT_{j_{RES},d},$$

where j = D (dividend benchmark portfolio or $MKT_{D,d}$) or ND (nonpayer benchmark portfolio or $MKT_{ND,d}$). Panel B presents the factor loadings and the alpha of dividend initiators during the year before and after initiation using the following regression specification:

$$Ret_{i,d} = \alpha_i + \beta_i MKT_{D_{RES},d} + \gamma_i MKT_{ND_{RES},d} + \delta_{MKT}MKTRF_d + \delta_{SMB}SMB_{d,} + \delta_{HML}HML_d + \delta_{UMD}UMD_{d,} + \varepsilon_{i,d},$$

where $Ret_{i,d}$ is the return on dividend initiator i on day d. $MKT_{D_{RES},d}$ and $MKT_{ND_{RES},d}$ refer to residuals of the dividend (MKT_D) and non-dividend (MKT_{ND}) portfolio returns when regressed on the Fama-French-Carhart four-factor model, respectively. For firms that initiate dividends in year t, the pre-event period (PRE) and the post-event period (POST) refer to year t-1 and t+1 respectively. The column POST-PRE reports the difference in mean coefficient values in the POST and the PRE periods. α is reported in percentage points. The sample of Panel B consists of 1,427 dividend initiators during the sample period 1981–2012.

Panel A: Factor loadings of dividend payer portfolio and nonpayer portfolio

Factor loadings	Nonpayer portfolio		Dividend portfolio		Diff. in mean (Payer - Nonpayer)	*t*-value of Diff.
	Mean	Median	Mean	Median		
b_{MKT}	0.890	0.900	0.856	0.856	-0.034	-1.72
b_{SMB}	0.844	0.835	0.479	0.493	-0.365	-12.52
b_{HML}	0.113	0.076	0.309	0.297	0.196	5.02
b_{UMD}	-0.100	-0.100	-0.068	-0.074	0.032	1.18
α	0.089	0.075	0.034	0.034	-0.055	4.34

Panel B: Factor loadings of dividend initiators before (PRE) and after (POST) dividend initiations

Factor loadings	PRE		POST		Diff. in mean (POST - RRE)	*t*-value of Diff.
	Mean	Median	Mean	Median		
β_i	0.161	0.221	0.382	0.456	0.221	3.29
γ_i	0.299	0.236	0.223	0.163	-0.077	-2.62
δ_{MKT}	0.847	0.874	0.804	0.822	-0.043	-2.9
δ_{SMB}	0.721	0.679	0.675	0.619	-0.047	-2.35
δ_{HML}	0.238	0.225	0.232	0.226	-0.005	-0.22
δ_{UMD}	-0.014	-0.029	-0.027	-0.019	-0.014	-0.69

α	0.103	0.09	0.068	0.067	-0.036	-6.94

Table 7
Turnover comovement of dividend initiators

This table presents the comovement of turnover for dividend initiators and control firms with the turnover of the benchmark portfolios of dividend payers and nonpayers. The control firm for each dividend initiator is obtained using a propensity-score matching approach matched on these characteristics: *log (Total Asset), Market/book ratio, Stock return in prior one year, Idiosyncratic risk, Leverage*, and *Return on asset (ROA)*. We report the estimates of the following turnover regressions:

$$RTurn_{i,d} = \alpha_i + \sum_{\tau=-1}^{1} \beta_{i,\tau} * RTurn_{D_{RES,d+\tau}} + \sum_{\tau=-1}^{1} \gamma_{i,\tau} * RTurn_{ND_{RES,d+\tau}} + \varepsilon_{i,d},$$

where $RTurn_{i,d}$ is a detrended, residual of daily turnover for stock *i* on day *d*. $RTurn_{D_{RES,d}}$ ($RTurn_{ND_{RES,d}}$) is the equal-weighted average of daily turnover residual of the benchmark portfolio of dividend payers (nonpayers). Panel A presents estimates of the regression coefficients for dividend initiators: $\beta^T = \sum_{i \in Initiators} \beta_{i,-1}^T + \beta_{i,0}^T + \beta_{i,1}^T$ and $\gamma^T = \sum_{i \in Initiators} \gamma_{i,-1}^T + \gamma_{i,0}^T + \gamma_{i,1}^T$. The corresponding coefficients for the control firms are reported in Panel B (denoted as β_C^T and γ_C^T). Panel C presents the differences between two groups. For firms that initiate dividends in year *t*, the pre-event period (PRE) and the post-event period (POST) refer to years *t*-1 and *t*+1, respectively. The column POST-PRE reports the difference in mean coefficient values in the POST and the PRE periods.

Panel A: Turnover comovement of dividend initiators

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β^T	0.469	13.31	0.561	16.05	0.091	2.11
γ^T	0.563	16.02	0.441	12.25	-0.122	-2.62
$\beta^T - \gamma^T$	-0.094	-1.41	0.119	1.77	0.213	2.50

Panel B: Turnover comovement of control firms

	PRE		POST		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
β_C^T	0.465	12.83	0.421	11.27	-0.044	-0.92
γ_C^T	0.676	18.39	0.727	18.85	0.051	1.03
$\beta^{TC} - \gamma_C^T$	-0.211	-3.07	-0.306	-4.24	-0.095	-1.03

Panel C: Turnover comovement of dividend initiators – turnover comovement of control firms

	PRE (Initiator - Control)		POST (Initiator - Control)		POST - PRE	
	Mean	*t*-value	Mean	*t*-value	Mean	*t*-value
$\beta^T - \beta_C^T$	0.004	0.08	0.140	2.84	0.136	2.08
$\gamma^T - \gamma_C^T$	-0.113	-2.28	-0.286	-5.45	-0.173	-2.52
$\beta^T - \beta_C^T - (\gamma^T - \gamma_C^T)$	0.117	1.27	0.425	4.42	0.308	2.43

Table 8

Dividend clientele and return comovement: evidence from mutual funds

This table presents the changes in the mutual fund holdings of stocks that initiate dividends. In each year *t*, we calculate the weighted average dividend yield across all stocks held in each fund *f*:

$$DivYld_{f,t} = \sum_{i \in \emptyset_{f,t}} w_{i,f,t} * DivYld_{i,t-1},$$

where $w_{i,f,t}$ is the investment weight of stock *i* held by fund *f* in year *t*; $DivYld_{i,t}$ is the dividend yield on stock *i* and $\emptyset_{f,t}$ is the set of stocks held by fund *f* in year *t*. Next, all funds are ranked from the highest to lowest $DivYld_{f,t}$ quintiles. A *HIGH_DIVYLD* (*LOW_DIVYLD*) quintile contains funds that hold relatively high (low) dividend-paying stocks. Panel A presents the changes in holdings of dividend initiators for funds sorted into quintiles based on $DivYld_{f,t}$. If firm *i* initiates dividend payment in year *t*, we compute the change in investment holdings of fund *f* ($\Delta w_{i,f,t+1}$) from the period before the initiation to the post-initiation year: $w_{i,f,t+1}$ - $w_{i,f,t}$. We aggregate the change in investment weights across all dividend initiators in year *t* and report:

$$\Delta w_{f,t+1} = \sum_{i \in Initiators\ in\ year\ t} (w_{i,f,t+1.} - w_{i,f,t}).$$

Panel B presents the changes in institutional holdings across three ten-year sub-periods: 1983–1992, 1993–2002, and 2003–2012.

Panel A: Fund holdings of dividend initiators in PRE/POST initiation periods (full periods)

Fund dividend yield quintile	PRE ($w_{f,t}$)	POST ($w_{f,t+1}$)	POST – PRE ($w_{f,t+1}$- $w_{f,t}$)	*t*-value of POST-PRE
1(LOW_DIVYLD)	2.893	2.566	-0.327	-5.89
2	2.275	2.210	-0.065	-1.99
3	1.858	1.910	0.051	2.02
4	1.464	1.586	0.122	4.76
5 (HIGH_DIVYLD)	0.728	0.991	0.263	9.84
HIGH_DIVYLD – LOW_DIVYLD			0.590	9.58

Panel B: Fund holdings of dividend initiators in POST-PRE initiation periods (sub-periods)

	1983–1992		1993–2002		2003–2012	
Fund dividend yield quintile	$\Delta w_{f,t+1}$	*t*-value	$\Delta w_{f,t+1}$	*t*-value	$\Delta w_{f,t+1}$	*t*-value
1(LOW_DIVYLD)	0.024	0.22	-0.059	-0.93	-0.595	-6.36
2	0.092	1.24	0.102	3.08	-0.214	-3.86
3	0.269	4.29	0.170	6.97	-0.076	-1.74
4	0.184	3.27	0.213	7.53	0.049	1.12
5 (HIGH_DIVYLD)	0.228	4.31	0.176	6.27	0.336	7.36
HIGH_DIVYLD – LOW_DIVYLD	0.204	1.70	0.235	3.40	0.931	8.95

Table 9

Flow-induced trading and returns of dividend payers and nonpayers

This table reports the effect of mutual fund flow-induced trading pressure on monthly stock returns. We construct two stock-level flow-induced trading measures similar to Lou (2012): $FIT\_DP_{i,m}$ measures the flows for all dividend-prone funds that hold the stock *i* in month *m*; $FIT\_DA_{i,m}$ measures the flows for all dividend-averse funds that hold the stock *i*. For stock *i* and fund *f* in month *m*, the stock-level flow-induced trading measures are:

$$FIT\_DP_{i,m} = \sum_{f \in DP} Flows_{f,m} * \frac{Shares_{fij,m}}{\sum_{f \in all\ funds} Shares_{f,i,m}},$$

$$FIT\_DA_{i,m} = \sum_{f \in DA} Flows_{f,m} * \frac{Shares_{ifi,m}}{\sum_{f \in all\ funds} Shares_{f,i,m}},$$

where *DP (DA) Funds* refer to dividend-prone (dividend-averse) funds with average dividend yield above (below) the median of all funds. Fund dividend yield is defined in Table 8. $Shares_{f,i,m}$ is the number of shares of stock *i* held by fund *f* as of month *m*. $Flows_{f,m}$ is the monthly flow for fund *f* in month *m*. We regress monthly stock returns on flow-induced trading measures and control variables, including the four FFC factors (market excess returns, SMB, HML, and Momentum factors), R_{IND} is the concurrent value-weighted monthly industry return. $R_{IND\text{-}DIV}$ ($R_{IND\text{-}NONDIV}$) is the industry returns consisting of dividend payers (nonpayers) in the industry, *LAGFIT_DP* and *LAGFIT_DA* are *FIT_DP* and *FIT_DA* lagged by one month. Panel A (B) presents results using dividend payers (nonpayers). The sample period spans from 1991 to 2012. Newey-West adjusted *t*-statistics are reported in parentheses. ***, **, and * represent significance levels at 1%, 5%, and 10%, respectively.

	MODEL1	MODEL2	MODEL3	MODEL4	MODEL5	MODEL6
FIT_DP	0.217***	0.178***	0.180***	0.271***	0.217***	0.182***
	(3.73)	(3.23)	(2.87)	(4.87)	(4.93)	(4.05)
FIT_DA	-0.128	0.009	0.004	-0.103	0.065	0.015
	(-0.86)	(0.11)	(0.06)	(-0.54)	(0.58)	(0.13)
R_{IND}		0.449***			0.444***	
		(23.32)			(23.04)	
$R_{IND\text{-}DIV}$			0.355***			0.354***
			(30.41)			(30.50)
$R_{IND\text{-}NONDIV}$			0.118***			0.117***
			(9.61)			(9.85)
LAGFIT_DP				-0.255***	-0.107	-0.120*
				(-3.00)	(-1.45)	(-1.74)
LAGFIT_DA				0.013	-0.024	-0.055
				(0.06)	(-0.13)	(-0.27)
MKT	0.852***	0.854***	0.853***	0.853***	0.855***	0.857***
	(38.44)	(34.03)	(33.39)	(34.94)	(31.63)	(31.78)
SMB	0.427***	0.429***	0.429***	0.429***	0.429***	0.432***
	(15.73)	(16.01)	(15.57)	(15.28)	(15.75)	(15.07)
HML	0.389***	0.397***	0.397***	0.397***	0.404***	0.408***
	(6.03)	(6.05)	(5.89)	(6.02)	(6.18)	(6.20)
UMD	-0.076***	-0.076***	-0.076***	-0.076**	-0.078***	-0.078***
	(-3.03)	(-3.42)	(-3.30)	(-2.83)	(-3.31)	(-3.12)
Intercept	0.001	0.001	0.001	0.001	0.001	0.001
	(0.82)	(1.02)	(1.01)	(1.05)	(1.06)	(1.04)
Adj_R^2	0.447	0.514	0.552	0.519	0.581	0.618

Panel B: Nonpayers

VAR	MODEL1	MODEL2	MODEL3	MODEL4	MODEL5	MODEL6

FIT_DP	0.146	-0.097	-0.736	0.232	0.287	2.171
	(0.24)	(-0.14)	(-0.87)	(0.24)	(0.26)	(1.45)
FIT_DA	0.484***	0.445***	0.468***	0.357**	0.480***	0.662***
	(8.70)	(5.38)	(5.14)	(2.81)	(2.98)	(8.01)
R_{IND}		0.403***			0.396***	
		(13.21)			(8.52)	
$R_{IND\text{-}DIV}$			0.140***			0.089
			(5.80)			(1.37)
$R_{IND\text{-}NONDIV}$			0.313***			0.277***
			(20.07)			(13.77)
LAGFIT_DP				-1.683**	-1.155	-2.523
				(-2.41)	(-1.25)	(-1.53)
LAGFIT_DA				-0.460**	-0.432*	-0.326
				(-2.67)	(-1.90)	(-1.72)
Mkt Ret	1.062***	1.055***	1.059***	1.093***	1.074***	1.141***
	(35.71)	(39.99)	(35.62)	(58.65)	(49.86)	(43.85)
SMB	0.926***	0.921***	0.930***	0.941***	0.915***	0.931***
	(26.66)	(24.71)	(28.32)	(18.69)	(18.26)	(16.74)
HML	0.023	0.036	0.005	0.098**	0.071	0.120**
	(0.69)	(0.97)	(0.14)	(2.57)	(1.68)	(2.23)
UMD	-0.167***	-0.166***	-0.156***	-0.170***	-0.161***	-0.256***
	(-4.25)	(-4.47)	(-3.76)	(-5.93)	(-4.44)	(-9.43)
Intercept	-0.001	-0.001	-0.001	-0.001	-0.001	0.000
	(-0.60)	(-0.74)	(-0.87)	(-0.70)	(-0.90)	(0.14)
R-square	0.646	0.722	0.793	0.785	0.860	0.930

Table 10

Mutual fund flows and dividend premium

This table presents the relation between mutual fund flows, dividend premium, and fund dividend yield. We group funds into quintiles based on fund-level, investment-weighted average dividend yield of stocks in the fund (see Table 8). Funds in the top and bottom quintiles are represented by indicator variables *D(HIGH_DIVYLD)* and *D(LOW_DIVYLD)* respectively. We estimate the following regression with fund-month observations:

$$Flow_{f,m+1} = \alpha + b_1 DivPrem_m * \mathrm{D}_{f,m} + b_2 DivPrem_m + b_3 \mathrm{D}_{f,m} + \delta Control_{f,m} + FEs + \varepsilon_{f,m},$$

where $Flow_{i,m}$ is monthly net flows for mutual fund *f* in month *m;* Dividend premium ($DivPrem_m$) is the measure in Baker and Wurgler (2004); $D_{f,m}$ is either *D(HIGH_DIVYLD)* or *D(LOW_DIVYLD)* measured in month *m*. We control for the following lagged fund characteristics: *log*(*TNA*), the fund's total net asset value; *Fund return,* the return on the fund; *log(Age),* the number of years since the inception of the fund's oldest share class; *Expenses,* the fund's expense ratio; *Total load,* the fund's total load fees; *Turnover*, the portfolio turnover rate of the fund. We also control for the contemporaneous *Flow style,* the average net flows to mutual funds with the same investment objective. The regression includes year-fixed effects and fund-fixed effects (except in Column 1). Our sample covers all U.S. equity funds that invest at least 50% of assets under management in stocks from 1991 through 2012. Standard errors are corrected for heteroskedasticity and are clustered at fund level. *T*-statistics are reported in parentheses. *, **, *** indicate significance level at 10%, 5%, and 1%, respectively.

Dep. var.=	Monthly fund flows (*m*+1)			
Div.prem.**D*(*HIGH_DIVYLD*)	0.034***	0.038***		0.032***
	(7.35)	(8.15)		(6.75)
D(*HIGH_DIVYLD*)	0.004***	0.001		0.001
	(4.93)	(0.97)		(0.64)
Div.prem.**D*(*LOW_DIVYLD*)			-0.036***	-0.028***
			(-6.14)	(-4.68)
D(*LOW_DIVYLD*)			0.000	0.001
			(0.26)	(0.71)
Dividend premium	0.007**	-0.006*	0.008**	0.000
	(1.97)	(-1.65)	(2.32)	(0.04)
log(TNA)	-0.002***	-0.013***	-0.013***	-0.013***
	(-6.52)	(-11.92)	(-11.94)	(-11.97)
Fund return	0.082***	0.079***	0.079***	0.079***
	(18.45)	(18.13)	(18.01)	(18.00)
log(Age)	-0.011***	-0.028***	-0.028***	-0.028***
	(-24.02)	(-15.55)	(-15.46)	(-15.46)
Expenses	-0.832***	-0.931***	-0.924***	-0.936***
	(-10.37)	(-4.50)	(-4.47)	(-4.53)
Total load	0.068***	0.061	0.060	0.060
	(4.83)	(1.48)	(1.45)	(1.47)
Turnover	0.496***	0.284***	0.285***	0.284***
	(9.47)	(4.16)	(4.17)	(4.15)
Flow style	0.418***	0.417***	0.418***	0.417***
	(9.91)	(9.63)	(9.64)	(9.62)
Constant	0.041***	0.122***	0.122***	0.122***
	(20.17)	(21.92)	(21.94)	(21.86)
Year fixed effects	Y	Y	Y	Y
Fund fixed effects	N	Y	Y	Y
Observations	457,518	457,518	457,518	457,518
R-square	0.02	0.02	0.02	0.02

Appendix A. Historical dividend distributions of Citizens Utilities Company

This table presents historical dividend distributions of two classes of Citizens Utilities (CU) Company. In CU's financial reports for the 1989 fiscal year, the company announced that only stock dividends would be paid for both classes starting in 1990. The last cash dividend paid by the cash-dividend class (Series B) was declared on October 23, 1989 and the ex-dividend date was October 30, 1989. The first stock dividend paid by the cash-dividend class (Series B) was declared on February 16, 1990 and the ex-dividend date was February 22, 1990. We report quarterly cash dividends (distribution code=1232) and stock dividend (distribution code=5532) paid by the two classes for each year from 1984 to 1995.

Year	Cash dividend class (Series B)		Stock dividend class (Series A)	
	Cash dividends per share (USD)	Stock dividends per share (# New shares)	Cash dividends per share (USD)	Stock dividends per share (# New shares)
1984	1.80	0	0	0.07
1985	1.96	0	0	0.06
1986	1.62	0	0	0.05
1987	1.20	0	0	0.05
1988	1.34	0	0	0.04
1989	1.54	0	0	0.04
1990	0	0.06	0	0.06
1991	0	0.08	0	0.08
1992	0	0.04	0	0.04
1993	0	0.03	0	0.03
1994	0	0.05	0	0.05
1995	0	0.06	0	0.06