Dividend Clientele and Return Comovement

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Abstract

We study excess stock return comovement induced by dividend clientele. Using exogenous dividend initiations caused by 2003 Jobs and Growth Tax Relief Reconciliation Act, we find that stocks that initiate dividend after the Act (treated) experience increases in return comovement with a market-level dividend index. This effect persists after controlling for changes in firm fundamentals. Meanwhile, treated firms experience decreases in return comovement with a market-level non-dividend index. In addition, we identify comparable control firms with similar size, B/M, stock return, institutional ownership, ROA, and leverage with the treated firms. Using a difference-in-difference approach, we find that the increase of return comovement for treated firms is significantly larger than that for control firms. Moreover, excess return comovement induced by dividend clientele also shows up in a longer period from 1981 to 2012. Meanwhile, we find dividends-prone mutual funds gradually tilt more of their assets towards treated firm after the Act. We also find that dividend stock returns are exposed to flow risk for dividends-prone mutual funds.

Keywords: Dividend Clientele; Return Comovement; Style Investing. Tax

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The pioneering work by Barberis and Shleifer (2003) presents a model where investors allocate capital at the level of asset categories rather than individual stocks. These categories could be based on small and large market capitalization stocks, value and growth stocks, index and non-index stocks, or simply different investment styles. They show that category investing generates co-movement in stock returns as investor capital flows in and out of specific categories creates demand pressure for stocks within the style. Consistent with this argument, follow-on empirical studies show that stocks added to the index co-vary more with other stocks already in the index, and the increased co-movement cannot be explained by changes in fundamental correlations in the stocks (Barberis, Shleifer, and Wurgler, 2005; Greenwood, 2008; Boyer, 2011). Barberis, Shliefer and Wurgler (2005) also suggest that stocks that have similar investor clientele co-move more, reflecting the trading habitat of the shareholder type.

In this paper, we investigate the role of the investor preference for dividends as a source of return co-movement. Do investors view dividend characteristic of a stock as salient category and move their funds in and out of the category, causing stocks within the category to move together? The seminal paper by Miller and Modigliani (1961) postulates that firms that pay low (high) dividends attract investors who dislike (like) dividend income, and this matches corporate dividend policy with their dividend clienteles. Theoretical studies attribute dividend clientele to investor characteristics such as tax status, age or income preference (Miller and Modigliani, 1961; Edwin and Gruber, 1970; Allen, Bernardo, and Welch, 2000). For instance, tax-exempt institutional investors and retail investors with low marginal tax rates are prefer stocks paying more dividends, establishing dividend tax clienteles (e.g. Poterba (2004) and Graham and Kumar (2006), and Kawano (2014)).[2] Desai and Jin (2011) are able to draw to significant association between institutional clientele, and their tax and dividend preferences. There are also non-tax reasons for dividend clienteles. Hotchkiss and Lawrence (2007) find that some institutions consistently hold high (or low) dividend yield stocks and adjust their holdings in response to changes in firms' dividend policy, confirming the presence of institutional dividend clienteles. They argue that the observed clientele may be tax related or are driven by persistent institutional investment styles.

We investigate whether dividend clientele induces excess covariation in returns of stocks that belong the to the same dividend category, as investors allocate capital and trade by category. To illustrate, we

[2] Evidence on dividend tax clienteles in non-U.S. markets is documented in Lee, Liu, Roll and Subrahmanyam (2005), Rantapuska (2008) and Dahlqvist, Robertson and Rydqvist (2014).

examine if stocks that (do not) pay dividends co-move with other firms that also (do not) pay dividends, controlling for other firm characteristics and changes in firm fundamentals.

A major concern with studies on the habitat of investor clientele and return comovement is that they could be endogenous: investors in the same category choose to invest in similar stocks. The identification strategy of this paper rests on a reform that is exogenous to firm fundamentals but affects dividend clientele. The Jobs and Growth Tax Relief Reconciliation Act of 2003 in the United States (hereafter, the "2003 Tax Cut") provides a natural opportunity to understand the effects of dividend taxation on firm incentive to cater to prevailing investor demand for dividend, and ensuing effect of dividend clientele on return comovement. The 2003 Tax Cut is relatively exogenous to firm fundamental but increases firms' incentive to cater investor demand for dividend stocks, see Chetty and Saez (2005). We exploit 2003 Tax Cut to identify dividend initiations that is not motivated by firm fundamentals, and measure the change in return comovement around the event. We identify firms as dividend initiators if they did not pay dividend in the prior period, but start paying dividends in the year following the 2003 Tax Cut.

We find that firms that initiate dividends after the 2003 Tax Cut co-move significantly more (less) with other firms that consistently pay (do not pay) dividends. For example, the co-movement coefficient for dividend initiators with dividend paying firms increases by 0.20 (t=3.15) and decreases with non-dividend paying firms by 0.13 (t=3.78). Our main finding survives a battery of robustness tests. The co-movement estimates are unaffected by adjustment for exposure to the Fama-French (1993) risk factors (market, size and value factors) as well as the momentum factor (Jegadeesh and Titman (1993)). Accounting for stocks moving together due to industry-related common factors, we continue to find that the dividend initiators have stronger (weaker) co-movement with other dividend paying (non-paying) industry peers. Our tests predicates on the assumption that the firms that initiative dividends are not fundamentally different from the firms that do not change their dividend policy after the 2003 Tax Cut. Consistent with this assumption, stocks that share the same firm characteristics as the dividend initiators (our matched control sample) do not exhibit similar changes in return co-movement. Overall, our findings reinforce the prediction that changes in (dividend) investor clientele affects return co-movement.

Next, we expand the dataset to the full universe of all firms trading on NYSE/AMEX and NASDAQ over the longer sample period from 1981 to 2013. We obtain similar findings with the full sample: dividend payers (non-payers) co-move more with other dividend payers (non-payers) within the same industry. These results are also robust to various controls for fundamental sources that may give rise to stocks moving in tandem.

We deepen the investigation by examining the behaviour of institutional investors in response to the dividend initiations. Consistent with the argument that the change in return co-movement is related to a change in investor clientele, we find that mutual funds that historically prefer high (low) dividends tilt their portfolio holdings towards (away from) the dividend initiators. Moreover, we find that dividend paying stocks are exposed to mutual fund flow risk associated with the new investor clientele. Specifically, we find that returns of dividend stock is (not) significantly associated with a flow-induced trading by funds that historically prefer (low) high dividends. Hence, the change in return co-movement is related to a change in the institutional investor clientele.

Overall, we present fresh evidence consistent with the category or habitat based theories of return co-movement advocated in Barberis and Shleifer (2003) and Barberis, Shliefer and Wurgler (2005). Our contributions are twofold: first, we complement recent studies on the consequence of style investing. For example, return comovement has been shown to be influenced by investment style categories (Teo and Woo (2004) and Wahal and Yavuz (2013)) and commonality in shared firm ownership (Antón and Polk (2014)) We also broadens the salient "style" classifications used by investors beyond index constitutes (Barberis, Shleifer, and Wurgler, 2005; Greenwood, 2008; Boyer, 2011) and geographical location (Chan, Hameed, and Lau, 2003). Second, we offer new evidence on the presence of dividend clienteles. In addition to the evidence on investor preferences for dividends based on retail investors (Graham and Kumar (2006)) and institutional investors (Grinstein and Michaely (2005) and Desai and Jin (2011)), we show that the dividend clientele also affects excess return comovement.

The paper is organized as follows. Section 1 introduces the 2003 Tax Cut and present summary statistics. Section 2 presents the empirical methodology to test for excess return comovement related to dividend clientele using the 2003 Tax Cut as the main event. Section 3 investigates the dividend clientele effect in an extended sample of firms over a longer sample period. Section 4 provides evidence based on ownership by mutual funds with varying preference for dividends. Section 5 provides evidence on mutual fund flow risk associated with the investor clienteles. Section 6 concludes.

I. The Jobs and Growth Tax Relief Reconciliation Act of 2003

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 percent. Although the Act (which we will label the "2003 Tax Cut") was enacted on May 28, 2003, the tax cut on individual's dividend income was effective from the January 2003, when it was first proposed by the U.S. President. A reduction in dividend tax makes the dividend incomes more attractive to taxable investors. The 2003 Tax Cut favors the valuation of dividend stocks by their taxable investors, pushing the valuation of dividend higher. 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 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. However, 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. We confirm these observations in Appendix Table A1. We find that the number of dividend paying firms decline from 1996 to 2002 (see, for example, Fama and French (2001)) before surging in 2004, although the total number of firms declined modestly from 2003 to 2004. The increase in dividend payers is also consistent with prior studies arguing for tax status as a major driver for dividend clientele (Edwin and Gruber, 1970; Allen, Bernardo, and Welch, 2000; Graham, 2003; Poterba, 2004). As pointed by Brav et al (2008), the number of dividend payers has declined gradually in the later years, together with a decline in all listed firms. Clearly, the number of dividend payers is complicated in the changing composition of firms due to firms entering and exiting different industries. Consequently, we perform some of our analysis at the intra-industry level when we investigate the changes in return comovement.

II. Dividend initiations and return comovement

We study the dividend initiation driven by an exogenous shock to tax on dividend. The 2003 Tax Cut makes dividend paying stocks more attractive to taxable individual investors. Some of the non-dividend paying firms initiated dividend payment, partly to cater to the dividend clientele, either for tax or other reasons. We estimate the change in co-movement for these firms around their dividend initiation as described as below.

2. 1 Sample Construction

We use the cash dividend reported in the annual financial reports obtained from Compustat to identify dividend initiators (item "dv" in Compustat database). Specifically, we identify switchers as firms that do not pay dividend in any of three years around or prior to the 2003 Tax Cut, i.e., no cash dividend payment from year 2001 to 2003, but pays dividends in 2004. We consider all stocks with shares codes of 10 and 11 trading on NYSE/AMEX and NASDAQ. We call these firms are switchers or treatment firms interchangeably. The final sample covers 620 switchers.

We construct two benchmark portfolios, first portfolio consists of all stocks that pay dividend in all of the years around 2003 (from 2001 to 2006), and the second portfolio consists of all stocks that never pay dividend in any of the years around 2003 (from 2001 to 2006). The firms in the switcher group are not included in any of these portfolios. We calculate the monthly portfolio returns for the two benchmark portfolios by averaging across all stocks with in each portfolio.

We also construct two industry-level benchmark portfolios by repeating the above portfolio construction within each Fama-French 48 industry separately.

2. 2 Univariate Regressions

For each switcher, we regress returns of stocks that switch from non-dividend to dividend payer on the return of either of the two benchmark portfolios.

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD} + \varepsilon_{i,t}, \quad (1a)$$

$$Ret_{i,t} = \alpha_i + \gamma_i * MKT_{ND} + \varepsilon_{i,t}, \quad (1b)$$

where $Ret_{i,t}$ for stock i on day t. For each switcher stock *i*, we run time-series regression using daily returns and average the estimated regression coefficients across stocks. MKT_{DD} and MKT_{ND} refer to the equal-weighted daily portfolio returns for the two market portfolios we construct: all firms that pay divides every year during the event window (MKT_{DD}), and all firms that never pay dividends over the same window(MKT_{ND}). For each stock, we estimate regression (1a) and (1b) over the 12-month interval before the 2003 Tax Cut (Pre-Event window) and over the 12-month interval after the event (Post-Event window). Pre-event period is from Mar2002 to Mar2003 while the post-event period is from Mar2004 to Mar 2005.

To measure excess comovement with the two benchmark portfolios, we calculate the residual of benchmark portfolio returns after accounting for common risk factors, and regress stock returns on the residual of the two benchmark portfolio returns, again controlling for the same risk factors. Specifically, we estimate the coefficients from the following models:

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD_{RES}} + \delta * X + \varepsilon_{i,t}, \quad (2a)$$

$$Ret_{i,t} = \alpha_i + \gamma_i * MKT_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \quad (2b)$$

where $MKT_{DD_{RES}}$ and $MKT_{ND_{RES}}$ refer to residuals of two benchmark portfolio returns regressed on the Fama-French-Carhart four-factor model. X refers to a vector of four risk factors comprising of excess market return, small-minus-big firm factor (SMB), high-minus-low book-to-market factor (HML), and the Carhart momentum factor (MOM).

We calculate the average changes in comovement around the 2003 Tax Cut across all switching stocks,

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

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

where post and pre superscripts indicate that the parameter is estimated over the post- or pre-event windows, respectively, and *n* is the number of stocks that switch to dividend payers after 2003 Tax Cut.

The dividend clientele hypothesis jointly with the clientele based comovement model predict that firms that initiative dividends exogenously 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 ($\Delta\overline{\gamma} < 0$). On the other hand, the fundamental based return comovement predicts that both $\Delta\overline{\beta}$ and $\Delta\overline{\gamma}$ should be zero. To summarize, we test the following predictions about the excess comovement of returns on firms switching from zero dividend to dividend paying with regard to the two benchmark portfolios:

(i) $\Delta\overline{\beta} > 0$,

(ii) $\Delta\overline{\gamma} < 0$.

Table 1, Panel A, shows that the raw returns on switcher firms co-vary more with returns on dividend paying stocks after they start paying dividends in 2003. However, we also observe an increase in co-movement with non-divided paying stocks as well, though the magnitude is smaller. Clearly, it is important to account for common variations in both group of benchmark portfolios, which we do in Panel B. After accounting for the common factors represented by Fama-French-Carhart four-factor model, the switcher stocks register a significant increase in comovement with dividend-paying stocks, $\Delta\overline{\beta}$ =0.20 (t=3.15) and a simultaneous decrease in comovement with non-dividend paying stocks, $\Delta\overline{\gamma}$=-0.13 (t=-3.78). More specifically, during the pre-event window, these stocks co-move significantly with non-dividend stocks as expected and the comovement changes dramatically after they initiate dividend payments. Hence, we observe a striking change in the return comovement when firms start paying dividends, providing the first evidence in favour of dividend clientele based comovement.

2. 3 Bivariate Regressions

To better distinguish the fundamental-based theory of comovement from the friction- or sentiment-based theories, we introduce bivariate regression tests. For each switcher stock *i*, we regress its returns on the returns on the both benchmark portfolios:

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD} + \gamma_i * MKT_{ND} + \varepsilon_{i,t}, \quad (4)$$

We also estimate the regression after controlling for the common component captured by the four factor model:

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD_{RES}} + \gamma_i * MKT_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (5)}$$

Similar to the estimates of equations (1) and (2), we calculate the average changes in comovement around the 2003 Tax Cut across all switcher stocks depicted in equation (3a) and (3b). The results are reported in Panels C and D of Table 1. Focusing on the estimates of equation (5), we find results consistent with the univariate regressions. In fact, the parameter estimates are similar across univariate and bivariate specifications, favouring the clientele effects as a significant source of return comovement.

2. 4 Comovement within industries

In this section, we investigate the plausibility of comovement of switcher stocks being driven common industry factors. For example, it is possible that dividend paying firms come primarily from certain industries and the dividend initiators are also from the same industry. The increased comovement could be due to omitted industry factors. To address this concern, we repeat both univariate and bivariate regressions by replace the two benchmark portfolios with the equivalent portfolios constructed within each industry. Specifically, for each stock *i* that is a switcher stock, we construct two portfolios within each industry that stock *i* belongs: first industry portfolio consists of all stocks in the industry paying dividends in the six year window around the 2003 Tax Cut; and the second portfolio contains all non-dividend paying stocks in the industry over the same period. We use the 48 industry classification by Fama-French. For each switcher stock *i*, we run the following regressions:

$$Ret_{i,t} = \alpha_i + \beta_i * IND_{DD_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (6a)}$$

$$Ret_{i,t} = \alpha_i + \gamma_i * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (6b)}$$

$$Ret_{i,t} = \alpha_i + \beta_i * IND_{DD_{RES}} + \gamma_i * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (7)}$$

where $Ret_{i,t}$ for stock *i* on day t. $IND_{DD_{RES}}$ and $IND_{ND_{RES}}$ refer to residuals of returns from a Fama-French-Carhart four-factor model for industry-dividend portfolio and industry-non-dividend portfolio, respectively. Industry portfolio returns are equal-weighted among stocks in the portfolio, and we require that here are at least five stocks in each portfolio within each industry to be included in the sample. X

refer to a vector of Fama-French-Carhart four risk factors. Similar to equation (3), we calculate the average changes in comove around the 2003 Tax Cut across all switching stocks in the sample:

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

$$\Delta\overline{\gamma} = \sum_{i=1}^{n} (\gamma_i^{Post} - \gamma_i^{Pre})/n, \qquad (3b)$$

Table 2 present the estimates of comovement with industry benchmark portfolios. Panel A shows the results of univariate tests where the covariance of switchers with industry-dividend paying portfolio increase by 0.07 (t=4.86) after the dividend initiation event. We obtain a similar increase in comovement within industries in the bivariate regressions reported in Panel B, where $\Delta\overline{\beta}$=0.08 (t=4.93). We also obtain a decrease in the comovement of the switcher stocks with non-dividend paying stocks in the same industry, although $\Delta\overline{\gamma}$ is significantly negative only in the bivariate regressions. Hence, our main finds of clientele based comovement is robust to control for stocks within the same industry, which may better account for fundamental characteristics.

2. 5 Matched Sample Analyses

We supplement our control for fundamental characteristics of switcher firms and the benchmark stocks using a matching sample. For each switcher stock, we obtain a comparable control firms that do not switch but have similar fundamental characteristics as the switcher stock in terms of firm size, market to book ratio, past stock returns, return on assets, institutional ownership level, and leverage. These firm characteristics are potentially related to the propensity for firms to initiate dividends. We estimate the regression coefficients for the matched firms:

$$Ret_{i,t}^{S} = \alpha_i + \beta_i^{S} * IND_{DD_{RES}} + \gamma_i^{S} * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \qquad (8a)$$

$$Ret_{i,t}^{C} = \alpha_i + \beta_i^{C} * IND_{DD_{RES}} + \gamma_i^{C} * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \qquad (8b)$$

where the superscripts *S* and *C* refer to switcher (or treatment) firms and matched (or control) firms respectively. We calculate the average changes in comovement around the 2003 Tax Cut across all stocks in switchers group and control groups, denoting the averages in each group as $\Delta\overline{\beta}^{S}$, $\Delta\overline{\beta}^{C}$, $\Delta\overline{\gamma}^{S}$, and $\Delta\overline{\gamma}^{C}$. After controlling for the Fama-French-Carhart four common factors, a clientele based comovement implies that the comovement in the switcher stocks with dividend-paying (non-dividend) industry peers are higher (lower):

(iii) $\Delta\overline{\beta}^{S} - \Delta\overline{\beta}^{C} > 0,$

(iv) $\Delta\overline{\gamma}^{S} - \Delta\overline{\gamma}^{C} < 0,$

The matching process uses firm characteristics are matched at the beginning of 2003. When matching firms by industry, we initially require the control firms to be in the same industry as switcher firms defined by the one-digit SIC code. The matching procedure reduces the number of switcher firms with valid control firms to 474.

Table 3 presents the results using a propensity matching sample but uses the market portfolio benchmarks in equation 3. Panel A of Table 3 confirms that the change in return comovement for switcher stocks remain intact for the reduced sample of switcher stocks. On the other hand, firms in the control sample do not exhibit similar pattern of comovement – there is no change in the comovement of these control firms with dividend paying stocks. These results reinforce that our earlier findings are not driven by some fundamental characteristics of the dividend initiators.

Next, we impose a stricter requirement that when we choose the control firm we require that the firm belongs to the same industry as the switcher firm based on the Fama-French 48 industry classifications This further reduces our switcher sample with valid control firms to 410. Table 4 presents results. Panel A of Table 4, presents the mean characteristics of switcher and control samples. As expected, all the firm characteristics are not significantly different across the two groups. In panels B and C of Table 4, we report the bivariate regressing coefficients that control for industry membership and firm characteristics. Again, we find that switcher firms significantly increase their comovement with dividend paying peers ($\Delta\overline{\beta}^{S}$ > 0). However, their comovement with non-dividend peers does not change for the reduced sample. The pattern of comovement for the control firms is different from the switcher firms. In Table 4 panel D, we formally test the predictions in (iii) and (iv). Consistent with (iii), we find that $\Delta\overline{\beta}^{S} - \Delta\overline{\beta}^{C} > 0,$ and it is statistically different from zero. Also, we find that: $\Delta\overline{\gamma}^{S} - \Delta\overline{\gamma}^{C} < 0,$ consistent with hypothesis (iv), although we do not obtain significance. Overall, our findings are robust industry wide common trend driving excess comovement of switcher stocks with other dividend paying stocks. In Appendix A2, we require the matching process to match on CEO ownership levels to account for agency issues driving dividend decisions. Although this requirement limits the number of switcher firms, we find qualitatively similar results.

3. Dividend Clientele and Return Comovement: Full sample evidence

We conduct additional tests using data starting from 1981 to 2013, using all common stocks in US (share code equals to 10 or 11). We analyse whether dividend stocks, in general, co-vary more (less) with other dividend paying (non-dividend paying) stocks, especially those in the same industry.

To this end, we identify the state of dividend policy of each firm every year. In each year t, if a firm pays regular cash dividends in three years from year t-2 to t, then we classify the stock as a constant-dividend-payer.[3] On the other hand, if a firm does not pay cash dividends in any of the three years from t-2 to t, then we treat it as a non-dividend stock. For each stock, we regress the monthly stock return on industry-dividend portfolios and industry-non-dividend portfolios in the 36 months from year t+1 to t+3. The industry-dividend (industry-non-dividend) portfolio includes other dividend paying (non-paying) stocks that belong to the same industry, excluding the stock in the regression. We calculate the average of coefficient across all constant-dividend-payers and all non-dividend stocks in each year. Then we calculate the time-series of average for coefficient for the two groups, separately. We conduct similar test using residual of portfolio returns instead of raw portfolio returns.

The dividend-clientele hypothesis predicts that in general constant-dividend-payers would covary more with the industry-dividend portfolio than with the industry-non-dividend portfolio, while non-dividend stocks co-varying more with the industry-non-dividend portfolio than with the industry-dividend portfolio.

Table 5 reports the results using monthly returns from 1981 to 2013. We plot the coefficient by year in Figures 2 and 3, and report the time-series average of coefficient in Table 5, Panels A and B. Panel A

[3] Our results are similar if we use the past one year to define dividend paying stocks.

shows that constant-dividend stocks comove more with other dividend stocks in the same industry. This finding is robust across all model specifications. Similarly, the non-dividend paying stocks also comove more with other non-dividend paying stocks. As shown in Figures 2 and 3, the comovement coefficents are persistent across years. In Appendix Figure A1 and Figure A2, we show that the regression coefficients are prevalent across most Fama-French 48 industries and are not dominated by a few industries.

4. Habitat of Investors in Dividend Stocks – Evidence from Mutual Fund Holdings

In an effort to uncover the driving force for the change in return comovement for switchers around 2003 Tax Cut, we document the change in mutual fund investors' portfolio weights on all these switcher stocks. The habitat view of stock comovement is that investors have preference for specific stock characteristics and they trade in these stocks in a similar fashion. This creates demand shocks as they buy or sell the same assets in tandem. We empirically measure the preference of mutual fund investors for dividend paying stocks by looking at their historical holdings. Specifically, we calculate the cross-sectional average of stock dividend yield (dividend per share/price) across all stocks held in each fund. Because we are interested in how mutual funds change their portfolio weights in switching stocks after the 2003 Tax Cut, we estimate the fund preference for dividend using the fund holding information as of 2003 Q1, the quarter immediately before the 2003 Tax Cut. We extract the quarterly mutual fund holdings for all U.S. equity mutual funds from Thomas Reuters CDA/Spectrum database. To calculate the number of shares held by each mutual fund at the end of the quarter, we assume that the manager does not trade between the report date and the quarter-end (adjusting for stock splits).

Table 6 presents cross-sectional regressions using changes in fund holdings of switcher stocks (after and before the 2003 Tax Cut) as dependent variable. Each observation corresponds to an equity mutual fund. For each fund i, we run following regression:

$$\Delta Hld_i = \propto + \beta_D Avg\ Div\ Yield_{i,03Q1} + \beta_S Avg\ Hld\ Size_{i,03Q1} + \beta_V Avg\ Hld\ Value_{i,03Q1} + \beta_T Log(TNA)_{i,03Q1} + \beta_R Fund\ Annual\ Ret_{i,02Q1-03Q1} + \varepsilon_i$$

ΔHld_i is the difference in the fund's holding of switchers (i.e., fraction of fund dollar asset invested in all switchers) at two dates. The columns in Table 6 reports ΔHld_i in various years: 2003-2004, 2004-2005 and 2003-2005, starting from the end of the first quarter of the respective years. All explanatory variables are measured as of 2003Q1. *Fund Avg Div Yield*$_{03Q1}$ is the cross-sectional value-weighted average of dividend yield (dividend per share/price) across all stocks held in a fund portfolio. *Fund Avg Div/AT*$_{03Q1}$ is the cross-sectional value-weighted average of total dividend scaled by total asset across all stocks held in a fund portfolio. We also use the quintile rank of the two variables (5 indicates the highest and 1 indicates the lowest). Similar to Boyer (2011), we control for the average size score and value score for stocks held by each fund. *Fund Hld Size*$_{03Q1}$ (*Fund Hld Value*$_{03Q1}$) is the cross-sectional average of quintile rank of market cap (book to market ratio) across all stocks held in a fund portfolio (score range from one to five). *Log(TNA)*$_{03Q1}$ is the log of total net assets managed by a fund as of 2003Q1. *Fund Return*$_{03Q1}$ is the fund annual return in the period ending at 2003Q1. We include all US equity mutual funds with at least $5 million TNA.

In Table 6, we find that mutual funds that have stronger preference for dividend stocks tend to increase their holdings in switcher stocks, compared with other mutual funds. This evidence offers additional insights about channel of excess return co-movement between switcher stocks and dividend index return, i.e., increased ownership (and possibly trading) by dividend-prone mutual funds.

5. Stock Returns of Dividend Stocks and Flow-Risk arising from Dividend Clientele

We explore whether dividend stocks are exposed to risk associated with fund flows experienced by mutual funds that prefer dividend stocks in their portfolio. We first classify all mutual funds into dividend-prone funds and dividend-averse funds based on the average dividend yield of stocks held by each fund. We conduct the classification in each quarter. *Fund Avg Div Yield (q)* is the cross-sectional value-weighted average of dividend yield (dividend per share/price) across all stocks held in a fund portfolio as reported in quarter *q*. If a fund's *Fund Avg Div Yield (q) is* above median, then we group this fund as a dividend-prone fund (*DivProne.Fund*); otherwise we group it as a dividend-averse fund

(*DivAverse.Fund*). We derive the monthly mutual fund flow from mutual funds' total net assets and net monthly returns that are obtained from the Center for Research in Security Prices (CRSP) survivorship-bias-free mutual fund database.

In the second step, we construct two stock-level flow-induced trading measures similar to Lou (2012): the first measure, *FIT*, uses flows associated with all dividend-prone funds that hold the stock. For stock *j* and fund *i* in month *t*, we obtain stock level flow-induced trading:

$$FIT_{j,t} = \sum_{i \in DivProne.Funds} Flows_{i,t} * \frac{Shares_{i,j,t}}{\sum_{i \in all\ funds} Shares_{i,j,t}}$$

The second measure, *NFIT*, uses flows for all dividend-averse funds that hold the stock:

$$NFIT_{j,t} = \sum_{i \in DivAverse.Funds} Flows_{i,t} * \frac{Shares_{i,j,t}}{\sum_{i \in all\ funds} Shares_{i,j,t}}$$

$Shares_{i,j,t}$ is the number of stock *j* held by fund *i* as of month *t*. $Flows_{i,t}$ is the monthly flow for fund *i* in month *t*.

Higher *FIT* (*NFIT*) implies that dividend-prone (dividend-averse) mutual funds that hold the stock experience higher inflows. We expect that *FIT* is more significantly associated with stock return for dividend stocks than *NFIT*. This is because dividend-prone funds are more likely to allocate new money (positive inflows) to dividend stocks, due to their preference, compared to dividend-averse funds. Thus, inflows (outflow) to dividend-prone funds are more likely associated with positive (negative) return for dividend paying stocks.

Table 7 reports monthly stock returns on mutual funds flow-induced trading pressure for dividend stocks (similar as Table 5 panel A, we only retain stocks pay dividends in all of past three consecutive years and we call them constant-dividend stocks). After we identify a dividend stock in year *y*, we run monthly regression using returns in year y+1 to y+3 as dependent variable, and use the monthly flow-induced trading measure as main explanatory variable. We also control for other industry portfolio returns similar as Table 6.

For each year, we obtain the cross-sectional average of coefficients (regress stock return on flow-induced trading measures and other concurrent control variables) for all Constant-Dividend stocks (i.e., stocks pay dividend in all of past three years). Then we get time-series means of coefficient for each year. *LAGFIT*, *LAGNFIT* that are lagged by one month. We report *FIT* and *NFIT* that are in the same month as the stock return, and *LAGFIT*, LAGNFIT that are lagged by one month. The sample period is from 1990 to 2013 (monthly mutual fund flow data is only available from 1990).

In Table 7, we find that stock returns for constant dividend stocks are positively and significantly associated with concurrent flow-induced trading constructed based on fund flows of dividend-prone funds. In contrast, the relation is not significant for the dividend-averse fund-flow-induced trading. It suggests that the dividend stock returns are exposed more to the flow risk associated with funds that are prone to invest in dividend stocks, consistent with the dividend clientele hypothesis.

6. Conclusions

Overall, our finding provides new evidence in support of the friction- or sentiment-based view of return comovement. At the margin, firms that initiate dividend payment appear to change their 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 co-movement with other dividend paying (non-paying) stocks. Our finding of a dividend clientele based return co-movement is robust to a range of tests that control for variation in firm fundamentals. On the other hand, the change in return co-movement is consistent with dividend being a salient characteristic as a category used by investors to trade. Investors, who prefer high dividends, trade in a subset of stocks that pay dividends, and their trading in and out of the subset of stocks as a group generates co-movement in returns. The excess return comovement caused by dividend clientele supplement recent studies about empirical evidences of consequence of style investing. For instance, past style returns help explain future stock returns after controlling for fundamentals (Wahal and Yavuz, 2013), degree of shared ownership predicts cross-sectional variation in return comovement (Antón and Polk, 2014). It also broadens our understandings of potential "style" or category classifications used by investors. For instance, prior studies use index constituents (Barberis, Shleifer, and Wurgler, 2005; Greenwood, 2008; Boyer, 2011) and geographical location (Chan, Hameed, and Lau, 2003) as styles. It talks to recent works about the interplay of corporate dividend policy and holding or trading by institutional investors (Harris, Hartzmark, and Solomon, 2014; Desai and Jin, 2011; Grinstein and Michaely, 2005). We complement the evidence on changes in dividend yield in holdings by household (Kawano, 2014) and retail investors (Graham and Kumar, 2006), by showing that changes in dividend clientele affects the behavior of stock return as well.

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Figure 1: Number of all common stocks in U.S. in each year

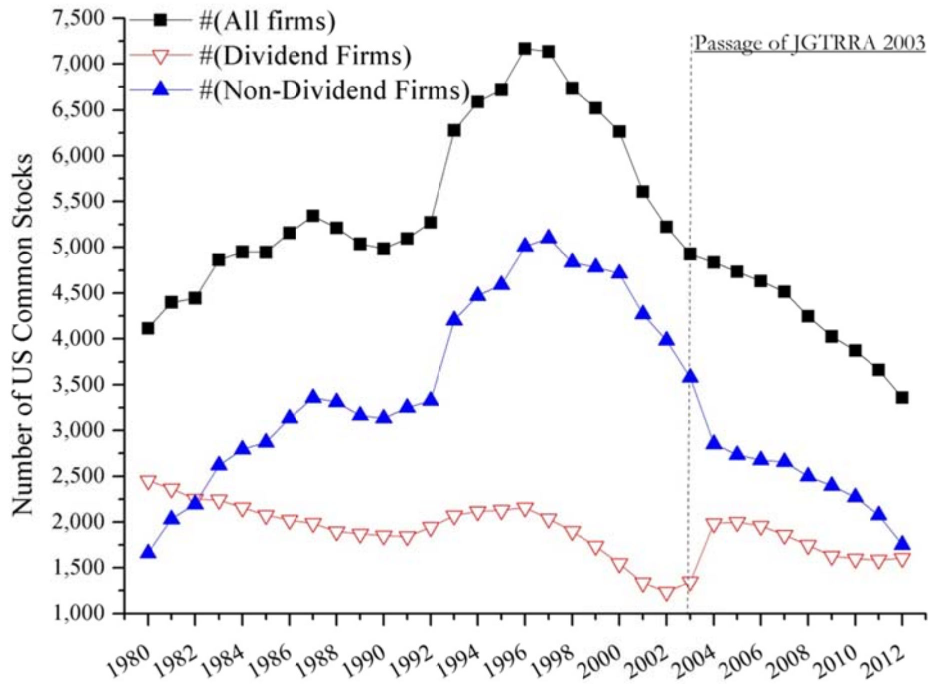

Figure 2: Coefficient by Year for all Dividend Stocks (as in Model 6 of Table 5 A)

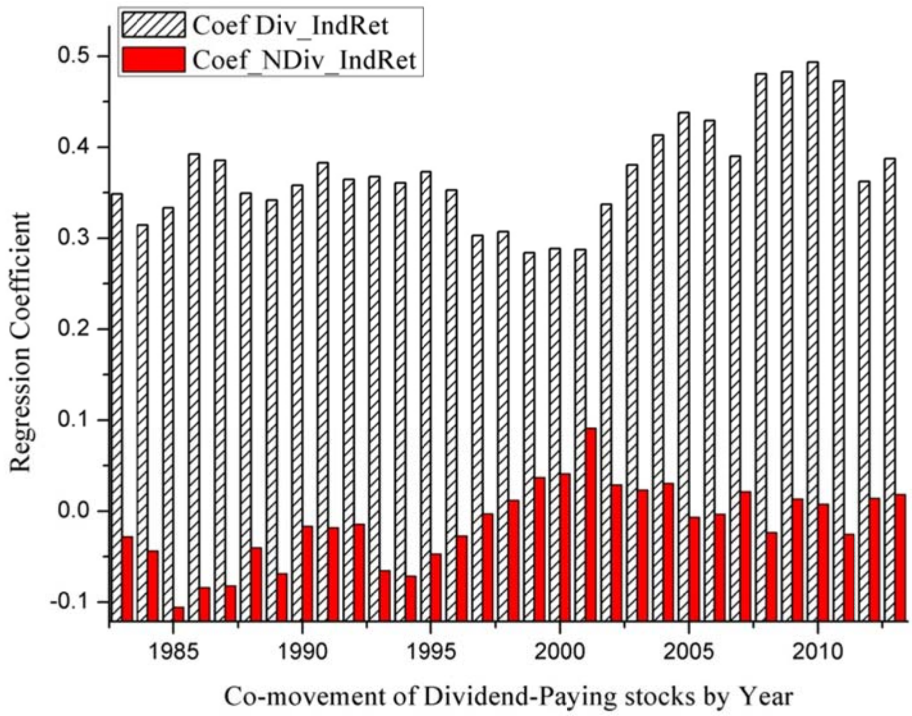

Figure 3: Coefficient by Year for all Non-Dividend Stocks (as in Model 6 of Table 5 B)

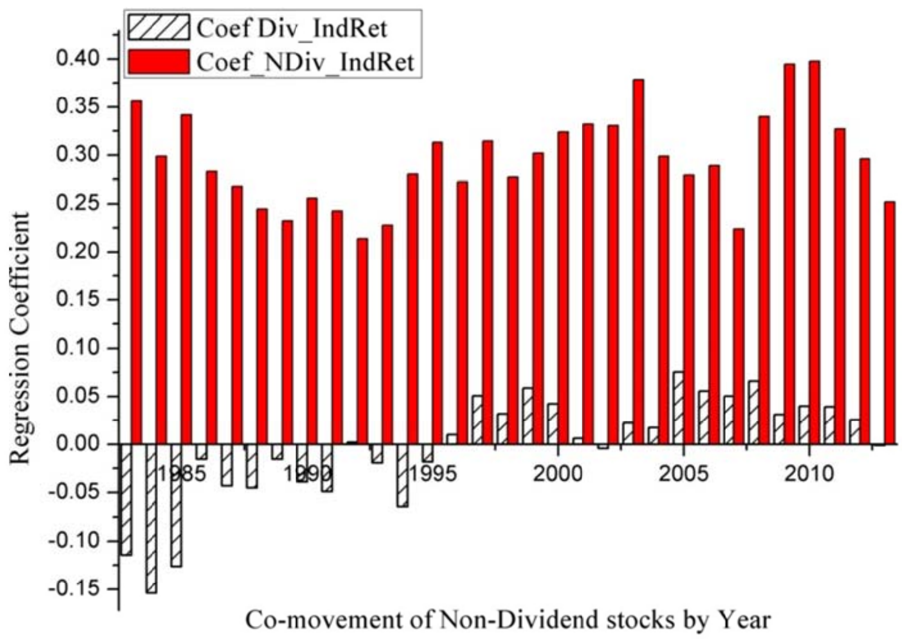

Table 1: Return Co-movement of Switcher with Market-level Portfolios

Switcher stocks (treated) refer to stocks that do not pay dividend in any year from 2001 to 2003 but start paying in 2004. This table reports estimates for following models for each switcher:

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD} + \varepsilon_{i,t}, \text{ (1a)}$$
$$Ret_{i,t} = \alpha_i + \gamma_i * MKT_{ND} + \varepsilon_{i,t}, \text{ (1b)}$$

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (2a)}$$
$$Ret_{i,t} = \alpha_i + \gamma_i * MKT_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (2b)}$$

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD} + \gamma_i * MKT_{ND} + \varepsilon_{i,t}, \text{ (3a)}$$
$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD_{RES}} + \gamma_i * MKT_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (3b)}$$

where $Ret_{i,t}$ for stock *i* on day t. For each switcher stock *i*, we run time-series regression using daily returns and average across stocks. MKT_{DD} and MKT_{ND} refer to the equal-weighted daily portfolio returns for the two market portfolios, all firms that pay divides every year around the event and all firms that never pay dividends around the event, respectively. $MKT_{DD_{RES}}$ and $MKT_{ND_{RES}}$ refer to residual of two portfolio returns using the Carhart four-factor model. X refers to four risk factors (Market, SMB, HML, Momentum). We report coefficients of portfolio returns in both pre-event and post-event period separately. Pre-event period spans from Mar. 2002 to Mar. 2003. Post-event period spans from Mar. 2004 to Mar 2005. Switch stock *i* is not included in any of the portfolios. There are 620 switcher stocks in total.

Panel A: Univariate Test Using Raw Market Portfolio Returns (Model 1a & 1b)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.703	29.74	0.544	24.98	0.159	8.56
γ_i	0.497	30.01	0.451	24.53	0.046	3.19
$\beta_i - \gamma_i$	0.206	24.71	0.093	17.83	0.113	16.56

Panel B: Univarate Test Using Residual of Market Portfolio Returns (Model 2a & 2b)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.23	4.79	0.034	0.72	0.196	3.15
γ_i	-0.072	-1.9	0.061	1.94	-0.133	-3.78
$\beta_i - \gamma_i$	0.302	4.33	-0.028	-0.58	0.329	4.34

Panel C: Bivariate Test Using Raw Market Portfolio Returns (Model 3a)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.545	16.7	0.421	15.91	0.123	4.39
γ_i	0.132	6.57	0.118	5.77	0.013	0.65
$\beta_i - \gamma_i$	0.413	8.49	0.303	7.20	0.11	2.43

Panel D: Bivariate Test Using Residual of Market Portfolio Returns (Model 3b)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.202	4.29	0.03	0.66	0.172	2.87
γ_i	-0.053	-1.39	0.058	1.87	-0.111	-3.19
$\beta_i - \gamma_i$	0.255	4.46	-0.028	-0.56	0.283	4.16

Table 2: Return Co-movement of Switcher with Industry-level Portfolios

This table reports estimates for following models for each switcher:

$$Ret_{i,t} = \alpha_i + \beta_i * IND_{DD_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (1a)}$$

$$Ret_{i,t} = \alpha_i + \gamma_i * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (1b)}$$

$$Ret_{i,t} = \alpha_i + \beta_i * IND_{DD_{RES}} + \gamma_i * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{ (2)}$$

where $Ret_{i,t}$ for stock *i* on day t. For each switcher stock *i*, we run time-series regression using daily returns and average across stocks. $IND_{DD_{RES}}$ and $IND_{ND_{RES}}$ refer to residual of two industry-level portfolio returns using the Carhart four-factor model. The first portfolio is consisted of all firms in the same industry that pay divides every year around the event, and the second portfolio is consisted of all firms in the same industry that never pay dividends around the event. Industry portfolio returns are equal-weighted among stocks in the portfolio, and we require there are at least five stocks in each portfolio. X refer to a vector of four risk factors. We use Fama-French 48 industry classification. We report the coefficient of portfolio returns in both pre-event and post-event period separately. Pre-event period starts from Mar2002 to Mar2003. Post-event period starts from Mar2004 to Mar 2005. Switch stock *i* is not included in any of the portfolios (refer Table 1 for definition of switcher).

Panel A: Univarate Test Using Residual of Market Portfolio Returns (Model 1a & 1b)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.061	6.21	-0.012	-1.10	0.073	4.86
γ_i	-0.004	-0.63	0.003	0.51	-0.007	-0.82
$\beta_i - \gamma_i$	0.065	6.01	-0.014	-1.26	0.079	5.09

Panel B: Bivariate Test Using Residual of Market Portfolio Returns (Model 2)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.067	6.52	-0.017	-1.37	0.084	4.93
γ_i	-0.011	-1.69	0.007	1.00	-0.018	-1.85
$\beta_i - \gamma_i$	0.078	6.02	-0.024	-1.44	0.102	4.62

Table 3: Matched sample- Co-movement with Market-Wide Portfolio

We find a control firm for each switcher firm using propensity score matching. We compare following dimensions: Log total asset, Market/Book ratio, stock return, Institutional ownership, ROA, and leverage at the beginning of year 2003.We require controls firms have the similar likelihood to be a switcher (require the propensity difference less than 1%). We find valid control firms for 474 switcher firms.

We report estimates from the following model

$$Ret_{i,t} = \alpha_i + \beta_i * MKT_{DD_{RES}} + \gamma_i * MKT_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \text{(3b)}$$

Panel A: Only Treat Firms (Switchers)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.191	3.72	-0.011	-0.23	0.202	3.27
γ_i	-0.089	-1.99	0.001	0.03	-0.09	-2.29
$\beta_i - \gamma_i$	0.28	4.23	-0.012	-0.23	0.292	4.01

Panel B: Only Control Firms

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.294	4.31	0.334	5.76	-0.04	-0.57
γ_i	0.293	7.43	0.13	3.22	0.164	3.84
$\beta_i - \gamma_i$	0.001	0.01	0.204	2.89	-0.203	-2.61

Table 4: Matched Sample- Co-movement with Industry-Wide Portfolio

We find a control firm for each switcher firm using propensity score matching. We compare following dimensions: Log total asset, Market/Book ratio, stock return, Institutional ownership, ROA, and leverage at the beginning of year 2003. We require controls firms have the similar likelihood to be a switcher (require the propensity difference less than 1%). In addition, switcher and control firms are required to be in the same FF 48 industry. We find valid control firms for 410 switcher firms.

Panel A shows the comparison of switcher and controls firms after matching. Panel B shows the results using similar specification as Table 2. We report estimate from following regression for treat firms and control firms in each period separately. Pre-event period starts from Mar 2002 to Mar 2003. Post-event period starts from Mar 2004 to Mar 2005. Switch stock *i* is included in neither of the portfolios.

$$Ret_{i,t} = \alpha_i + \beta_i * IND_{DD_{RES}} + \gamma_i * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, (1)$$

Panel B reports the change in coefficient of industry portfolio returns (After minus Before), and the difference (difference-in-difference) of change in coefficients. Panel C shows the coefficient in different periods for treat firms that could be matched. Panel D shows the coefficient in different periods for control firms.

Panel A: Comparison of observable characteristics after matching

Matching Variables	Treat	Control	Diff (T - C)	*t*-value
Log(Asset)	6.732	6.589	0.143	1.151
M/B	0.414	0.396	0.018	0.325
Stock Returns	0.012	0.009	0.003	1.431
Institutional Ownership	26.840	25.085	1.755	0.962
ROA	0.034	0.018	0.016	1.499
Leverage	0.116	0.111	0.005	0.612

Panel B: Only Treat Firms (Switchers)

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.029	2.95	-0.02	-1.39	0.05	2.69
γ_i	0.027	1.97	0.015	1.31	0.012	0.67
$\beta_i - \gamma_i$	0.002	0.11	-0.035	-1.59	0.037	1.23

Panel C: Only Control Firms

	POST		PRE		POST - PRE	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	-0.014	-0.96	0.04	2.92	-0.054	-2.86
γ_i	0.036	2.37	0.001	0.1	0.035	1.78
$\beta_i - \gamma_i$	-0.05	-2.07	0.039	1.86	-0.089	-2.77

Panel D: Comparison of Treat (Switcher) and Control groups

	Treat (POST - PRE)		Control (POST - PRE)		Treat - Control	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.05	2.69	-0.054	-2.86	0.103	3.71
γ_i	0.012	0.67	0.035	1.78	-0.022	-0.78
$\beta_i - \gamma_i$	0.037	1.23	-0.089	-2.77	0.124	2.64

Table 5: Regression of Monthly Stock Returns on Industry Portfolio Returns

We construct two portfolios within each Fama-French 49 industry. (1) DIV Ind. Portfolio consists of all stocks within the industry that pay dividend as indicated by the most recent financial report; (2) NDIV Ind. Portfolio consists of all stocks within the industry that do not pay dividend as indicated by the most recent financial report. We calculate value-weighted industry portfolio return for the two portfolios each month (use market capitalization of each stock in the portfolio as weight). *Industry Ret (DIV)* and *Industry Ret (Non-DIV)* are portfolio returns for DIV Ind. Portfolio and NDIV Ind. Portfolio, respectively. We exclude the stock in regression when constructing the portfolio returns. *Industry Ret (DIV, Residual)* and *Industry Ret (Non-DIV, Residual)* are the residual of corresponding monthly industry portfolio returns using four-risk-factor model.

In panel A (B), for year *t*, we regress monthly stock returns of each Constant-Dividend-Paying (Seldom-Dividend-Paying) stock on industry portfolio returns in year *t*+1~*t*+3. Constant-dividend-paying stocks refer to stocks that pay cash dividends in all three years from year *t*-2 to *t*. Seldom-Dividend-Paying stocks in panel B refer to stocks that do not pay cash dividends in any of past three years from year *t*-2 to *t*. In regression for each stock, we remove the stock from constituents of industry portfolios before constructing the industry portfolio returns. We require that there are at least 24 monthly observations in the period [t+1, t+3].

For each year, we obtain the cross-sectional average of coefficients. Then we get time-series means of coefficient for each year. The sample period is from 1981 to 2012. Newey-West adjusted *t* -statistics are reported in parentheses.

Panel A: Regression of monthly returns of **Constant-dividend-paying** stocks on industry portfolio returns

	MODEL1	MODEL2	MODEL3	MODEL4	MODEL5	MODEL6
Industry Ret(DIV)	0.736***		0.575***			
	(20.97)		(18.65)			
Industry Ret(Non-DIV)		0.435***	0.184***			
		(11.23)	(13.17)			
Industry Ret(DIV, Residual)				0.386***		0.373***
				(25.80)		(21.04)
Industry Ret(Non-DIV, Residual)					0.055***	-0.014
					(2.79)	(-1.06)
Mkt Ret				0.901***	0.900***	0.901***
				(89.82)	(88.27)	(88.79)
SMB				0.508***	0.509***	0.509***
				(33.05)	(32.77)	(32.70)
HML				0.311***	0.312***	0.313***
				(5.07)	(5.09)	(5.12)
UMD				-0.091***	-0.090***	-0.091***
				(-5.65)	(-5.63)	(-5.68)
Intercept	0.001	0.004***	0.000	0.001***	0.001***	0.001***
	(0.58)	(4.10)	(0.40)	(3.19)	(3.13)	(3.22)
RSQ	0.238	0.173	0.308	0.39	0.395	0.447

Panel B: Regression of monthly returns of **Seldom-dividend-paying** stocks on industry portfolio returns

	MODEL1	MODEL2	MODEL3	MODEL4	MODEL5	MODEL6
Industry Ret(DIV)	0.728***		0.146***			
	(13.48)		(4.51)			
Industry Ret(Non-DIV)		0.752***	0.666***			
		(21.77)	(27.72)			
Industry Ret(DIV, Residual)				0.126***		-0.006
				(5.60)		(-0.33)
Industry Ret(Non-DIV, Residual)					0.311***	0.300***
					(25.77)	(22.83)
Mkt Ret				0.982***	0.985***	0.982***
				(32.89)	(33.99)	(33.07)
SMB				1.068***	1.064***	1.064***
				(13.69)	(13.81)	(13.71)
HML				0.079	0.082	0.074
				(1.15)	(1.22)	(1.08)
UMD				-0.197***	-0.191***	-0.192***
				(-7.37)	(-7.22)	(-7.13)
Intercept	0.002	0.003	0.002	0.003	0.003	0.003
	(0.82)	(1.39)	(1.03)	(1.43)	(1.36)	(1.42)
RSQ	0.126	0.163	0.201	0.305	0.312	0.341

Table 6: Changes of Mutual Fund Holdings of Switcher Stocks around the 2003 Tax Cut

This table presents cross-sectional OLS regressions using changes in fund holdings of switcher stocks (after and before the 2003 Tax Cut) as dependent variable. Each observation corresponds to an equity mutual fund. For all fund *i*, we run following regression:

$$\Delta Hld_i = \propto + \beta_D Avg\ Div\ Yield_{i,03Q1} + \beta_S Avg\ Hld\ Size_{i,03Q1} + \beta_V Avg\ Hld\ Value_{i,03Q1} + \beta_T Log(TNA)_{i,03Q1} + \beta_R Fund\ Annual\ Ret_{i,02Q1-03Q1} + \varepsilon_i$$

ΔHld_i is the difference of fund's holding of switchers (i.e., fraction of fund dollar asset invested in all switchers) at two dates. In columns 1~3, ΔHld_i refers to the difference of fund's holding of switchers in 2004Q1 and 2003Q1; In columns 4~6, ΔHld_i refers to the difference of fund's holding of switchers in 2005Q1 and 2004Q1; In columns 7~9, , ΔHld_i refers to the difference of fund's holding of switchers in 2003Q1 and 2005Q1.

All explanatory variables are measured as of 2003Q1. *Fund Avg Div Yield*$_{03Q1}$ is the cross-sectional value-weighted average of dividend yield (dividend per share/price) across all stocks held in a fund portfolio. *Fund Avg Div/AT*$_{03Q1}$ is the cross-sectional value-weighted average of total dividend scaled by total asset across all stocks held in a fund portfolio. We also use the quintile rank of the two variables (5 indicates the highest and 1 indicates the lowest). *Fund Hld Size*$_{03Q1}$ (*Fund Hld Value*$_{03Q1}$) is the cross-sectional average of quintile rank of market cap (book to market ratio) across all stocks held in a fund portfolio (score range from one to five). *Log(TNA)*$_{03Q1}$ is the log of total net assets managed by a fund as of 2003Q1. *Fund Return*$_{03Q1}$ is the fund annual return in the period ending at 2003Q1. We include all US equity mutual funds with at least $5 million TNA.

Panel A: Use *Fund Avg Div Yield$_{03Q1}$* as explanatory variable

Dep Var=	Change in Fund holdings of Switchers								
	H_{04Q1}-H_{03Q1}			H_{05Q1}-H_{04Q1}			H_{05Q1}-H_{03Q1}		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fund Avg Div Yield$_{03Q1}$	0.380***	0.536***	0.499***	0.257***	0.458***	0.450***	0.637***	0.994***	0.949***
	(3.31)	(3.13)	(2.88)	(2.62)	(3.12)	(3.04)	(4.53)	(4.73)	(4.50)
Fund Hld Size$_{03Q1}$		-0.000	-0.001		-0.003***	-0.004***		-0.004**	-0.005***
		(-0.29)	(-0.88)		(-2.78)	(-3.40)		(-2.18)	(-3.11)
Fund Hld Value$_{03Q1}$		-0.004	-0.005*		-0.002	-0.003		-0.006*	-0.008***
		(-1.40)	(-1.93)		(-1.03)	(-1.44)		(-1.86)	(-2.59)
Log(TNA)$_{03Q1}$			0.002***			0.002***			0.004***
			(3.82)			(4.30)			(6.15)
Fund Return$_{03Q1}$			0.003**			0.001			0.004***
			(2.34)			(0.98)			(2.61)
Constant	-0.013***	-0.005	-0.000	-0.006***	0.012	0.011	-0.019***	0.006	0.011
	(-7.73)	(-0.62)	(-0.04)	(-4.03)	(1.57)	(1.39)	(-9.11)	(0.59)	(0.95)
Observations	2,228	2,228	2,221	2,228	2,228	2,221	2,228	2,228	2,221
R-squared	0.00	0.01	0.01	0.00	0.01	0.02	0.01	0.01	0.03

Panel B: Use quintile rank of *Fund Avg Div Yield$_{03Q1}$* as explanatory variable

Dep Var=	Change in Fund holding in Switchers								
	H_{04Q1}-H_{03Q1}			H_{05Q1}-H_{04Q1}			H_{05Q1}-H_{03Q1}		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fund Avg Div Yield Ran	0.002***	0.002**	0.002**	0.001*	0.002*	0.002*	0.003***	0.004***	0.004***
	(2.72)	(2.25)	(2.06)	(1.71)	(1.83)	(1.76)	(3.40)	(3.11)	(2.92)
Fund Hld Size$_{03Q1}$		0.000	-0.001		-0.003**	-0.004***		-0.003	-0.004**
		(0.05)	(-0.56)		(-2.16)	(-2.79)		(-1.46)	(-2.41)
Fund Hld Value$_{03Q1}$		-0.002	-0.004		-0.000	-0.001		-0.003	-0.005
		(-0.83)	(-1.41)		(-0.17)	(-0.61)		(-0.80)	(-1.58)
Log(TNA)$_{03Q1}$			0.002***			0.002***			0.004***
			(3.80)			(4.27)			(6.10)
Fund Return$_{03Q1}$			0.003**			0.001			0.004***
			(2.51)			(1.21)			(2.90)
Constant	-0.014***	-0.011	-0.005	-0.006***	0.005	0.006	-0.019***	-0.005	0.001
	(-6.39)	(-1.26)	(-0.50)	(-2.99)	(0.76)	(0.75)	(-7.28)	(-0.50)	(0.12)
Observations	2,228	2,228	2,221	2,228	2,228	2,221	2,228	2,228	2,221
R-squared	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.03

Panel C: Use *Fund Avg Div/AT*$_{03Q1}$ as explanatory variable

Dep Var=	Change in Fund holding in Switchers								
	H_{04Q1}-H_{03Q1}			H_{05Q1}-H_{04Q1}			H_{05Q1}-H_{03Q1}		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fund Avg Div/AT$_{03Q1}$	0.391***	0.437***	0.377**	0.154	0.367***	0.341**	0.545***	0.804***	0.718***
	(3.20)	(2.79)	(2.39)	(1.47)	(2.75)	(2.52)	(3.62)	(4.19)	(3.72)
Fund Hld Size$_{03Q1}$		-0.001	-0.002		-0.004***	-0.004***		-0.005**	-0.006***
		(-0.56)	(-0.96)		(-2.80)	(-3.28)		(-2.41)	(-3.08)
Fund Hld Value$_{03Q1}$		0.001	-0.001		0.002	0.001		0.003	0.000
		(0.61)	(-0.27)		(1.14)	(0.51)		(1.29)	(0.14)
Log(TNA)$_{03Q1}$			0.002***			0.002***			0.003***
			(3.74)			(4.21)			(6.01)
Fund Return$_{03Q1}$			0.003**			0.001			0.004***
			(2.38)			(1.02)			(2.67)
Constant	-0.013***	-0.013	-0.007	-0.005***	0.005	0.005	-0.018***	-0.007	-0.002
	(-7.51)	(-1.62)	(-0.83)	(-3.00)	(0.83)	(0.68)	(-8.20)	(-0.75)	(-0.21)
Observations	2,228	2,228	2,221	2,228	2,228	2,221	2,228	2,228	2,221
R-squared	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.03

Panel D: Use quintile rank of *Fund Avg Div/AT*$_{03Q1}$ as explanatory variable

Dep Var=	Change in Fund holding in Switchers								
	H_{04Q1}-H_{03Q1}			H_{05Q1}-H_{04Q1}			H_{05Q1}-H_{03Q1}		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fund Avg Div/AT Rank$_{03Q1}$	0.002***	0.002***	0.002**	0.001	0.002**	0.001*	0.003***	0.004***	0.003***
	(3.19)	(2.78)	(2.40)	(1.05)	(2.23)	(1.95)	(3.32)	(3.81)	(3.32)
Fund Hld Size$_{03Q1}$		-0.001	-0.002		-0.003**	-0.004***		-0.004**	-0.006***
		(-0.59)	(-0.99)		(-2.49)	(-2.93)		(-2.21)	(-2.86)
Fund Hld Value$_{03Q1}$		0.001	-0.001		0.002	0.001		0.003	0.000
		(0.56)	(-0.32)		(1.18)	(0.54)		(1.28)	(0.12)
Log(TNA)$_{03Q1}$			0.002***			0.002***			0.003***
			(3.70)			(4.18)			(5.96)
Fund Return$_{03Q1}$			0.003**			0.001			0.004***
			(2.45)			(1.17)			(2.83)
Constant	-0.015***	-0.014*	-0.008	-0.004**	0.003	0.003	-0.019***	-0.010	-0.004
	(-6.82)	(-1.80)	(-0.92)	(-2.39)	(0.52)	(0.46)	(-7.21)	(-1.11)	(-0.42)
Observations	2,228	2,228	2,221	2,228	2,228	2,221	2,228	2,228	2,221
R-squared	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.03

Table 7: Monthly Stock Returns of Dividend Stocks and Fund-Flow Risk

This table reports monthly stock returns on mutual funds flow-induced trading pressure. We construct two stock-level flow-induced trading measures similar to Lou (2012): the first measure, *FIT*, uses flows for all dividend-prone funds that hold this stock; the second measure, *NFIT*, uses flows for all dividend-averse funds that hold this stock. For stock *j* and fund *i* in month *t*, we get stock level flow-induced trading:

$$FIT_{j,t} = \sum_{i \in DivProne.Funds} Flows_{i,t} * \frac{Shares_{i,j,t}}{\sum_{i \in all\ funds} Shares_{i,j,t}}$$

$$NFIT_{j,t} = \sum_{i \in DivAverse.Funds} Flows_{i,t} * \frac{Shares_{i,j,t}}{\sum_{i \in all\ funds} Shares_{i,j,t}}$$

$Shares_{i,j,t}$ is the number of stock *j* held by fund *i* as of month *t*. $Flows_{i,t}$ is the monthly flow for fund *i* in month *t*. For each year, we obtain the cross-sectional average of coefficients (regress stock return on flow-induced trading measures and other concurrent control variables) for all dividend stocks (we only return stocks that pay dividend constantly, i.e., pay in all of past three years).Then we get time-series means of coefficient for each year. We report *FIT* and *NFIT* that are in the same month as the stock return, and *LAGFIT*, *LAGNFIT* that are lagged by one month. The sample period is from 1990 to 2013 (monthly fund flow data starts from 1990). Newey-West adjusted *t* -statistics are reported in parentheses.

	MODEL1	MODEL2	MODEL3	MODEL4	MODEL5	MODEL6
FIT	0.318***	0.329***	0.323***	0.299***	0.298***	0.264***
	(7.58)	(5.37)	(7.26)	(5.90)	(4.28)	(6.14)
NFIT	0.023	-0.120	0.048	0.044	-0.117	0.063
	(0.38)	(-0.96)	(0.89)	(0.49)	(-0.78)	(0.76)
LAGFIT				-0.076	-0.130*	-0.079
				(-1.15)	(-1.84)	(-1.39)
LAGNFIT				-0.138**	-0.041	-0.057
				(-2.83)	(-0.71)	(-1.09)
Industry Ret(DIV, Residu	0.406***		0.396***	0.406***		0.399***
	(19.61)		(15.98)	(18.58)		(15.19)
Industry Ret(Non-DIV, Residual)		0.068***	-0.013		0.068***	-0.014
		(2.90)	(-0.78)		(3.00)	(-0.84)
Mkt Ret	0.896***	0.893***	0.898***	0.897***	0.893***	0.899***
	(77.37)	(76.27)	(78.51)	(83.82)	(86.61)	(87.51)
SMB	0.459***	0.462***	0.459***	0.463***	0.469***	0.464***
	(17.63)	(16.41)	(17.33)	(17.62)	(16.44)	(17.85)
HML	0.378***	0.376***	0.382***	0.390***	0.387***	0.390***
	(5.63)	(5.47)	(5.78)	(5.74)	(5.47)	(5.68)
UMD	-0.111***	-0.114***	-0.110***	-0.110***	-0.111***	-0.107***
	(-6.47)	(-6.14)	(-6.42)	(-6.47)	(-6.18)	(-6.02)
Intercept	0.000	0.000	0.000	0.000	0.000	0.000
	(0.19)	(0.05)	(0.10)	(0.80)	(0.77)	(0.82)
RSQ	0.442	0.444	0.498	0.491	0.493	0.541

Table A1: Number of US Common Stocks across Years

This table shows the number of all common stocks in U.S. in each year, #(All firms); number of all firms that pay cash dividend as shown in cash flow statement (item "dv"), #(Dividend Firms); number of other firms that do not pay cash dividend, #(Non-Dividend Firms).

FYEAR	#(All firms)	#(Dividend Firms)	#(Non-Dividend Firms)
1980	4,115	2,454	1,661
1981	4,400	2,367	2,033
1982	4,446	2,251	2,195
1983	4,863	2,243	2,620
1984	4,951	2,158	2,793
1985	4,947	2,076	2,871
1986	5,156	2,023	3,133
1987	5,344	1,986	3,358
1988	5,210	1,898	3,312
1989	5,036	1,872	3,164
1990	4,984	1,851	3,133
1991	5,094	1,843	3,251
1992	5,271	1,944	3,327
1993	6,277	2,072	4,205
1994	6,590	2,118	4,472
1995	6,722	2,129	4,593
1996	7,167	2,159	5,008
1997	7,136	2,037	5,099
1998	6,737	1,899	4,838
1999	6,522	1,737	4,785
2000	6,264	1,548	4,716
2001	5,606	1,336	4,270
2002	5,221	1,237	3,984
2003	4,928	1,348	3,580
2004	4,837	1,984	2,853
2005	4,735	2,000	2,735
2006	4,633	1,958	2,675
2007	4,516	1,859	2,657
2008	4,247	1,748	2,499
2009	4,027	1,629	2,398
2010	3,872	1,599	2,273
2011	3,662	1,586	2,076
2012	3,360	1,607	1,753

Table A2: Alternative Matching based on Table 3

Add more variables that are potentially related to decision to pay dividend, CEO ownership and total pay-out as of 2002 (dividend + repurchase). Coefficients are estimated for:

$$Ret_{i,t} = \alpha_i + \beta_i * IND_{DD_{RES}} + \gamma_i * IND_{ND_{RES}} + \delta * X + \varepsilon_{i,t}, \quad (1)$$

Number of successful match substantially decreases due to limitation of coverage of CEO ownership data.

Panel A: Comparison after matching (#=57 treat and 57 control)

Matching Variables	Switcher	Control	Diff (Swi - Con)	t-value
Log(Asset)	8.239	8.508	-0.268	-0.718
M/B	0.853	0.783	0.071	0.394
Stock Returns	-0.004	-0.005	0.002	0.343
Institutional Ownership	64.373	69.941	-5.568	-1.567
ROA	0.103	0.088	0.016	0.857
Leverage	0.189	0.218	-0.029	-0.840
CEO Ownership	1.852	2.581	-0.729	-0.610
Total Pay-out (Div.+Repurchase	0.022	0.019	0.003	0.347

Panel B: Only Treat Firms (Switchers)

	After		Before		After - Before	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.06	2.45	-0.15	-4.03	0.21	4.25
γ_i	0.019	0.68	0.028	0.98	-0.009	-0.22
$\beta_i - \gamma_i$	0.041	0.93	-0.178	-2.95	0.219	2.77

Panel C: Only Control Firms

	After		Before		After - Before	
	Mean	t-value	Mean	t-value	Mean	t-value
β_i	0.025	0.81	-0.071	-1.37	0.096	1.39
γ_i	0.043	1.47	0.083	2.07	-0.041	-0.79
$\beta_i - \gamma_i$	-0.017	-0.33	-0.154	-1.8	0.137	1.23

Figure A1: Coefficient for all dividend stocks by Fama-French 48 industries in Model 5 (Table 2 A)

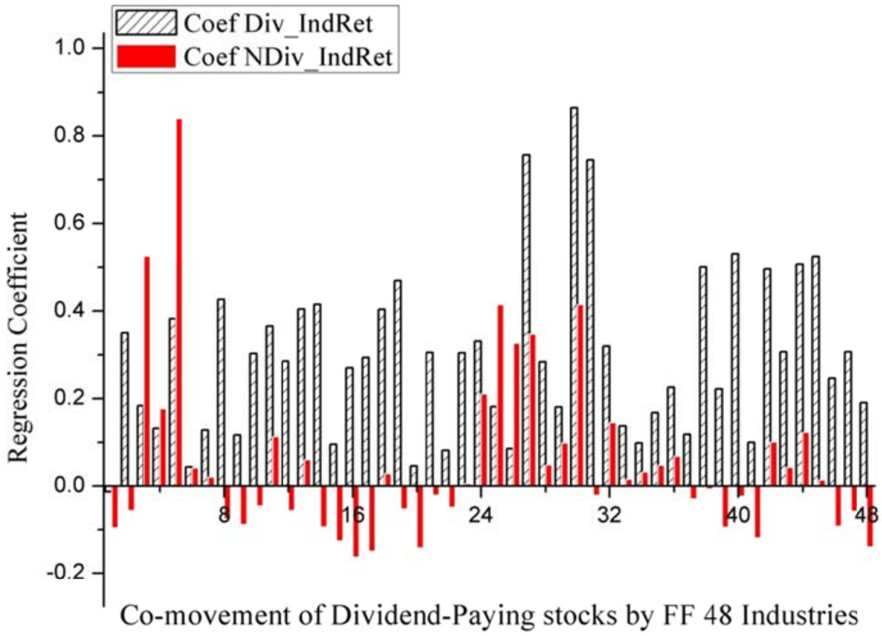

Figure A2: Coefficient for all Non-dividend stocks by Fama-French 48 industries in Model 5 (Table 2 B)