THE JOURNAL OF FINANCE • VOL. LXI, NO. 3 • JUNE 2006

# Do Dividend Clienteles Exist? Evidence on Dividend Preferences of Retail Investors

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**ABSTRACT**

We study stock holdings and trading behavior of more than 60,000 households and find evidence consistent with dividend clienteles. Retail investor stock holdings indicate a preference for dividend yield that increases with age and decreases with income, consistent with age and tax clienteles, respectively. Trading patterns reinforce this evidence: Older, low-income investors disproportionally purchase stocks before the ex-dividend day. Furthermore, among small stocks, the ex-day price drop decreases with age and increases with income, consistent with clientele effects. Finally, consistent with the behavioral "attention" hypothesis, we document that older and low-income investors purchase stocks following dividend announcements.

MORE THAN 40 YEARS AGO Miller and Modigliani (1961) argued that dividend clienteles could form based on investor characteristics. According to their hypothesis, firms that pay lower (higher) dividends attract investors who dislike (like) dividend income, and this creates the potential for an optimal match between the dividend policy of a firm and the dividend preferences of its stockholders. For instance, tax-exempt institutional investors and retail investors with low marginal tax rates are likely to prefer high dividend yield (DY) stocks. Miller and Modigliani also argue that clienteles might form based on age or income preferences. They conjecture that "young 'accumulators' prefer low-payout shares and retired persons lean toward 'income' stocks" for consumption purposes (p. 431).

More recently, behavioral hypotheses propose explanations for possible age and income clienteles. Shefrin and Statman (1984) argue that mental accounting may influence investors' dividend preferences—investors who keep dividend income and capital gains in two separate "mental accounts" may not treat them equally. Such investors may prefer high DY stocks because the

*John Graham is at the Fuqua School of Business, Duke University. Alok Kumar is at the Mendoza College of Business, University of Notre Dame. We would like to thank two anonymous referees, Ben Ayers, Brad Barber, Robert Battalio, Jennifer Blouin, Michael Brandt, Alon Brav, William Goetzmann, Yaniv Grinstein, Hans Heidle, Mike Hemler, Dong Hong, Sonya Lim, Bill McDonald, Bob McDonald, Roni Michaely, Michael Roberts, Paul Schultz, Mark Seasholes, Jim Seida, Hersh Shefrin, Rob Stambaugh (the editor), Meir Statman, Stijn van Nierwerburgh, and seminar participants at Duke University, New York University, University of Minnesota, University of Notre Dame, University of Texas at Austin, and the 2004 UNC Tax Symposium for helpful discussions and valuable comments. We thank Itamar Simonson for making the investor data available to us and Terrance Odean for answering numerous questions about the database. All remaining errors and omissions are our own.

dividend income may act as a "silver lining" when capital gains are low or negative. Life cycle considerations may also influence retail investors' dividend preferences (Shefrin and Thaler (1988)). Older investors, or any investor with a greater need for a regular income stream, may prefer high-yield stocks if they use dividend income to finance consumption. These investors may prefer cash dividends over "home grown" dividends (i.e., income generated by the partial liquidation of the portfolio) due to self-control considerations (Thaler and Shefrin (1981)). Furthermore, to avoid regret, they may adopt the heuristic "consume from dividend and keep the principal intact."

In this paper, we search for evidence of retail dividend clienteles using the investment accounts of more than 60,000 retail investors at a large U.S. discount brokerage house during the period 1991–1996. Understanding whether dividend clienteles exist is important for several reasons. First, if clienteles exist, they could affect optimal corporate financial decisions (Hamada and Scholes (1985)). For example, Pérez-González (2003) argues that tax preferences of influential shareholders influence dividend payout policies. Second, dividend clienteles can affect stock activity (Allen and Michaely (2003)), and the characteristics of a particular clientele can be impounded into asset prices (e.g., Elton and Gruber (1970)). Hotchkiss and Lawrence (2002) find that stock returns are more positive following a dividend increase when there is a clientele of dividend-preferring institutional investors. Moreover, if clienteles affect stock prices, this could have a feedback effect on managerial decisions. Brav et al. (2005) document that financial executives are hesitant to make big changes to payout policy because such changes might alter a company's investor base and adversely affect its stock price.

Several studies provide indirect evidence of tax-induced dividend clienteles by examining price and volume reactions around dividend events. Elton and Gruber (1970) find that implied marginal tax rates (as deduced from the ex-day price drop) are higher (lower) for low (high) DY stocks. Eades, Hess, and Kim (1984), Green and Rydqvist (1999), and Graham, Michaely, and Roberts (2003) provide corroborating evidence in favor of tax clienteles. Note that interpreting this indirect evidence in terms of tax clienteles is premised on investor characteristics (i.e., tax rates) being impounded into ex-dividend day stock returns. Numerous studies (e.g., Michaely, Thaler, and Womack (1995), Seida (2001)) examine volume reactions around dividend events (dividend changes, initiations, and omissions) and provide mixed evidence about whether clienteles exist.

Previous studies (e.g., Brav and Heaton (1997), Dhaliwal, Erickson, and Trezevant (1999), Grinstein and Michaely (2005)) provide direct evidence on the dividend preferences of institutional investors. Collectively, these results suggest that institutional dividend clienteles may exist. Furthermore, Brav et al. (2005) report that financial executives believe that retail investors prefer dividend-paying stocks.[1] However, direct evidence on the dividend preferences of retail investors has been less conclusive.[2]

[1] Approximately half of the respondents to their CFO survey indicate that the dividend preference of retail investors is an important determinant of their payout policies.

[2] Blume, Crockett, and Friend (1974) document an inverse relation between income (a proxy for marginal tax rates) and portfolio DY. Using data on the stock holdings of individual investors

We search for direct evidence of retail dividend clienteles using a 6-year panel of portfolio choices and trading behavior of a sample of retail investors. First, we examine portfolio holdings. We find that, as a group, retail investors prefer non-dividend paying stocks over dividend paying stocks.[3] However, cross-sectionally within the retail investor group, older and low-income investors prefer dividend paying stocks. Considering just dividend paying stocks, retail investors as a group prefer high DY stocks over low DY stocks. This is especially true for older and low-income investors. These dividend preferences vary in a manner consistent with tax incentives, particularly in circumstances in which tax incentives are strong and/or when consumption preferences are less important. For example, investors whose tax rates increased following the 1993 tax law change decreased the DY of their portfolios in response. Moreover, dividend holdings vary between taxable and tax-deferred accounts in a manner consistent with tax-motivated preferences.

Collectively, retail investor stock holdings are consistent with age- and tax-induced retail investor dividend clienteles, with the age clientele appearing to be stronger. Finding an age clientele is consistent with the behavioral self-control hypothesis whereby older investors, because they consume dividends, value the cash from dividends more so than do younger investors. An age clientele is also consistent with the conjecture by Miller and Modigliani (1961) that older investors seek dividend income. The evidence of dividend clienteles remains strong even when we control for the effects of a wide array of variables such as portfolio risk, trading frequency, and industry preferences.

We also examine trading behavior. We find that retail investors' trades around dividend events (ex-dividend days, dividend announcements, and dividend initiations) are consistent with clientele behavior. Investor groups that assign a greater valuation to dividends over capital gains (e.g., older and low-income investors) are net buyers before the ex-dividend date. Moreover, among small-cap stocks, for which retail investors are plausibly the marginal price-setters, we find evidence consistent with investor characteristics being impounded into ex-dividend stock prices (as assumed by Elton and Gruber (1970) and the associated literature). We also find that old and low-income investors increase their holdings following dividend initiations. Finally, consistent with the behavioral "attention" hypothesis (e.g., Lee (1992), Barber and Odean (2001)), we find that old and low-income investors exhibit abnormal buying behavior following dividend announcements.

Our paper is closely related to Scholz (1992), who uses data from the 1983 Survey of Consumer Finances to test for dividend clienteles. Controlling for transaction costs and risk, he finds that tax rates influence the DY of investor portfolios. Our portfolio holding results are broadly consistent with the findings

from a retail brokerage house, Pettit (1977) provides evidence of a tax-induced dividend clientele—investors in high tax brackets prefer low-yield stocks. However, using the same data as Pettit (1977) but a different methodology, Lewellen et al. (1978) are not able to "find in the data much evidence to support the notion that an important dividend-tax-clientele effect is in fact present" (p. 1395).

[3] Throughout the paper we use the term "retail investors" to refer to the group of retail investors in our sample. Our assumption is that retail investors in our sample are representative of the retail investor population in the United States. See the discussion in Section I.

of Scholz and reinforce the evidence of a tax-based dividend clientele. In addition, we extend his results in multiple dimensions.

We provide evidence of an age clientele and estimate the relative strengths of various clientele effects. Perhaps more importantly, we examine the actual stock holdings and trades of retail investors, while Scholz (1992) studies survey-declared year-end aggregate investor portfolios for a single year. The frequency of our data allows us to examine actual trades in individual stocks around dividend events (e.g., ex-dividend days), which is not possible using Survey of Consumer Finances' survey data. Our data consist of detailed stock-level data, which allows us to determine how the demand for a stock varies with investor characteristics and dividend yield. Finally, using detailed information about the composition of investor portfolios, we are able to obtain direct measures of portfolio risk instead of using survey-declared proxies to control for risk.

The rest of the paper is organized as follows. In the following section, we describe the data sets used in this study. In Section II, we study portfolio holdings to determine if they are consistent with the existence of retail investor dividend clienteles. In Section III, we examine trading activity around dividend events (ex-dividend days, dividend announcements, initiations, and omissions) in the context of clienteles. We conclude in Section IV with a summary and brief discussion.

## I. Data and Sample Characteristics

The primary data for this study consist of trades and monthly portfolio positions of retail investors at a major U.S. discount brokerage house for the period 1991–1996. There are 77,995 households in the database but we focus on the 62,387 that trade stocks. An average investor holds a four-stock portfolio (median is three) with an average size of $35,629 (median is $13,869). A typical investor executes nine trades per year, where the average trade size is $8,779 (median is $5,239). The average monthly portfolio turnover rate—the average of purchase and sales turnover rates—is 6.59% (median is 2.53%) among the investors in our sample. In any given month, approximately 80% of investors own at least one dividend paying stock.

For a subset of 31,260 households, demographic information such as age, income, occupation, marital status, gender, etc. is available.[4] We focus on the behavior of older and low-income investors. Panel A of Table I reports the distribution of investors by age and income. Approximately 15% of investors in our sample are 65 years or older while 17% have low income (annual household income $<$ $40,000).[5] Panel B of Table I shows that older investors hold larger and

[4] The demographic information is self-reported at the time the brokerage account is opened. Only age and income are available for all 31,260 investors.

[5] Given potential concerns about some of the demographic information being stale, we examine the age and income distributions conditioned on the household's account age. The account age is defined as the number of days between the brokerage account opening date and December 31, 1996. The mean age and income for account age quintiles 1 and 5 are 50.18 and $89,440, and 51.90 and $89,320, respectively. The mean differences are statistically insignificant. We also find that the distributions of income across age groups are similar for the oldest accounts and the most recently opened accounts.

**Table I**

## Age and Income Groups: Summary Statistics

This table reports the portfolio summary statistics for groups of retail investors. Panel A reports the distribution of investors sorted by age and income. Age and income are available for 31,260 investors in our sample. Panel B reports the means of the following portfolio variables: (i) portfolio size, (ii) trade size, (iii) portfolio turnover (in percent), (iv) proportion of portfolio allocated to mutual funds (MF Own), (v) number of stocks in the portfolio, (vi) Sharpe ratio (SR), (vii) portfolio beta, (viii) portfolio's small-minus-big (SMB) factor exposure, (ix) portfolio's high-minus-low (HML) factor exposure, and (x) portfolio's up-minus-down (UMD) factor exposure. Monthly portfolio returns are used to compute the portfolio performance measures, where investors with less than 1 year of returns are excluded from the analysis. The first row in Panel B reports the variable means for all investors in the sample, the second row reports the results for investors with demographic information, and the third row reports the means for investors with missing demographic information. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996.

Panel A: Distribution of Investors across Age and Income Groups

| | Age Groups | | | |
|---|---|---|---|---|
| Income Groups | Below 45 | 45–65 | Above 65 | Row Sum |
| Below 40K | 5.65 | 6.93 | 4.85 | 17.43 |
| 40–75K | 21.53 | 25.21 | 7.50 | 54.23 |
| Above 75K | 11.55 | 14.37 | 2.42 | 28.34 |
| Column sum | 38.73 | 46.50 | 14.77 | 100.00 |

Panel B: Characteristics of Investor Portfolios across Age and Income Groups

| Investor Group | Portfolio Size | Trade Size | Portfolio Turn | MF Own | Number of Stocks | SR | Portfolio $\beta$ | SMB | HML | UMD |
|---|---|---|---|---|---|---|---|---|---|---|
| All Investors | 34,760 | 8,689 | 5.12 | 0.18 | 4.17 | 0.10 | 1.20 | 0.86 | 0.17 | −0.32 |
| Investors with Demographies | 31,925 | 8,613 | 5.02 | 0.19 | 4.03 | 0.10 | 1.21 | 0.80 | 0.14 | −0.30 |
| Investors without Demographies | 40,554 | 9,529 | 5.63 | 0.16 | 4.58 | 0.11 | 1.17 | 0.98 | 0.15 | −0.23 |
| Age groups | | | | | | | | | | |
| Below 45 | 24,402 | 8,075 | 5.36 | 0.18 | 3.94 | 0.10 | 1.22 | 0.90 | 0.13 | −0.32 |
| 45–65 | 33,002 | 8,672 | 4.99 | 0.19 | 4.84 | 0.10 | 1.20 | 0.87 | 0.19 | −0.33 |
| Above 65 | 55,685 | 9,081 | 4.46 | 0.19 | 5.98 | 0.10 | 1.13 | 0.70 | 0.26 | −0.28 |
| Income groups | | | | | | | | | | |
| Below 40K | 31,530 | 8,093 | 5.24 | 0.19 | 4.60 | 0.09 | 1.18 | 0.87 | 0.25 | −0.33 |
| 40–75K | 31,480 | 8,272 | 5.10 | 0.18 | 4.56 | 0.10 | 1.20 | 0.87 | 0.18 | −0.32 |
| Above 75K | 37,296 | 9,411 | 4.90 | 0.18 | 4.80 | 0.10 | 1.20 | 0.83 | 0.12 | −0.32 |

more valuable portfolios than do younger investors, and older investor turnover is lower.[6] We also find that low-income investors hold slightly smaller portfolios and trade frequently relative to high-income investors. Other portfolio characteristics such as risk-adjusted performance (as measured by the Sharpe ratio)

[6] The monthly portfolio turnover rate is the average of purchase and sales turnover rates. The purchase turnover rate in month $t$ is the ratio of the dollar value of purchases in month $t$ (beginning-of-month stock prices are used to compute the value) and the dollar value of the portfolio at the end of month $t - 1$. The sales turnover rate is defined in an analogous manner.

and the proportion of the portfolio allocated to mutual funds are remarkably similar across the age and income groups.[7]

To benchmark our retail investor sample to the overall population of retail investors in the United States, we compare the stock holdings of our sample with those reported by the Federal Reserve (Survey of Consumer Finances (SCF), 1992, 1995).[8] According to the 1992 SCF, a typical household held $63,143 in stocks (median of $11,000). The stock ownership increased in the 1995 SCF to $90,571 in stocks (median of $14,500). The median portfolio size of an investor in our sample is $13,869, which is reasonably similar to the average portfolio sizes reported in the SCF.[9] Overall, the portfolio size of the retail investors in our sample appears to be reasonably representative of the portfolios of all households in the United States.

In addition to the retail investor information, we obtain quarterly institutional holdings from Thomson Financial. These data contain the end of quarter stock holdings of all institutions that file form 13F with the Securities and Exchange Commission. Institutions with more than $100 million under management are required to file form 13F, and common stock positions of more than 10,000 shares or more than $200,000 in value must be reported. A detailed description of the institutional ownership data is available in Gompers and Metrick (2001).

Finally, for each stock in our sample and for the 1991–1996 sample period, we obtain the quarterly cash dividend payments, monthly stock prices, monthly shares outstanding, and monthly stock returns from Center for Research in Security Prices (CRSP). A total of 3,418 CRSP stocks paid dividends during the sample period. From this set, 2,775 stocks are in our sample and they distribute 54,457 cash dividend payments.[10]

## II. Dividend Preferences of Retail Investors and Dividend Clienteles

### *A. Aggregate Dividend Preferences of Retail Investors*

As a starting point, we examine the aggregate portfolio holdings of the retail investors to search for direct evidence of dividend clienteles. Using the excess weight in dividend paying stocks as a measure of dividend preference, we examine whether retail investors as a group are attracted toward dividend paying stocks. The excess weight for a given portfolio is the difference between the actual weight and the expected weight in dividend paying stocks. The expected weight (if investors were to hold the market or were to randomly select

[7] Further details on the investor database are available in Barber and Odean (2000).

[8] The report is available at http://www.federalreserve.gov/pubs/oss/oss2/95/scf95home.html. Also, see Kennickell, Starr-McCluer, and Sunden (1997).

[9] In unreported results, we find that portfolio sizes are comparable when we condition on age and income.

[10] The mean dividend/price decile for stocks held by investors in our sample is 5.94, which is insignificantly different from the mean decile for stocks that are not held by investors in our sample (6.03).

stocks) is the weight in dividend paying stocks in the market portfolio. See the Appendix for details. For comparison, we also measure the excess weight in dividend paying stocks in the aggregate institutional portfolio.

The results are presented in Figure 1 (Panel A), where retail excess weight (EWD) is the difference between the retail weight and the expected weight. We find that EWD for the aggregate retail portfolio is negative (−6.84%).[11] In contrast, EWD for the aggregate institutional portfolio is positive (3.80%). The difference between the institutional and the retail EWD is positive (10.64%) and statistically significant ($p$-value $< 0.01$). This evidence indicates that, as a group, retail investors prefer nondividend paying stocks, and institutional investors prefer dividend paying stocks. The evidence on institutions is consistent with the results in Grinstein and Michaely (2005), who find that institutions prefer dividend paying stocks (as well as the stock of firms that repurchase shares). What is new in our evidence is the aggregate preference for nondividend stocks for the class of retail investors.[12]

Given the retail preference for nondividend paying stocks, we now investigate whether retail investors also prefer low DY stocks among the subset of stocks that pay dividends. First we form DY quintiles at the beginning of each year, based on total dividend payments and stock prices at the end of the previous December. Each month, we measure the normalized portfolio weight (in percent) in the DY quintile portfolios, where the total portfolio weight in dividend paying stocks, $w_t^{div}$, is used as the normalizing variable.[13] The sample period averages of these normalized portfolio weights are reported in Figure 2, Panel A. We also report the expected normalized portfolio weights in the five DY quintiles using the relative capitalizations of DY quintile portfolios in the market portfolio. For comparison, we also report the normalized portfolio weights for the aggregate institutional portfolio (Panel B). Finally, we measure the excess normalized weights (in percent) in the aggregate retail and institutional portfolios as the difference between the actual and the expected normalized portfolio weights.

We find that, at an aggregate level, retail investors prefer both low (bottom quintile) and high (top quintile) DY stocks. The excess normalized percentage weight is significantly positive for both low- and high-yield quintiles, though

[11] To examine whether the dividend preferences of a few large investors are driving our aggregate level results, we re-compute the annual EWD measures by excluding top $k\%$ ($k = 1, 2$) of investors with the largest portfolios. Our results are even stronger when we exclude these investors with large portfolios: for $k = 1$, the mean annual EWD measure in our sample period is −8.58%. The results are qualitatively similar for $k = 2$.

[12] For robustness, we examine whether the aggregate retail preference for dividend paying stocks is affected by a stock's market capitalization. We form size-quintile portfolios at the end of each year using the market-capitalization at the end of December and compute EWD for aggregate retail and institutional portfolios for each size-quintile. We find that within each size-quintile portfolio and in each year, retail investors as a group prefer nondividend paying stocks, while institutional investors prefer dividend paying stocks.

[13] At the end of month $t$, the total portfolio weights in dividend and nondividend paying stocks are $w_t^{div}$ and $w_t^{n\,div}$, respectively, where $w_t^{div} + w_t^{n\,div} = 1$. If the aggregate portfolio weights in the five DY quintile portfolios are $w_{1t}, w_{2t}, w_{3t}, w_{4t}$, and $w_{5t}$, respectively, where $w_{1t} + w_{2t} + w_{3t} + w_{4t} + w_{5t} = w^{div}{}_t$, then the normalized portfolio weights can be obtained as $w_{it}^{norm} = \frac{w_{it}}{w_t^{div}} \times 100, i = 1, \ldots, 5$.

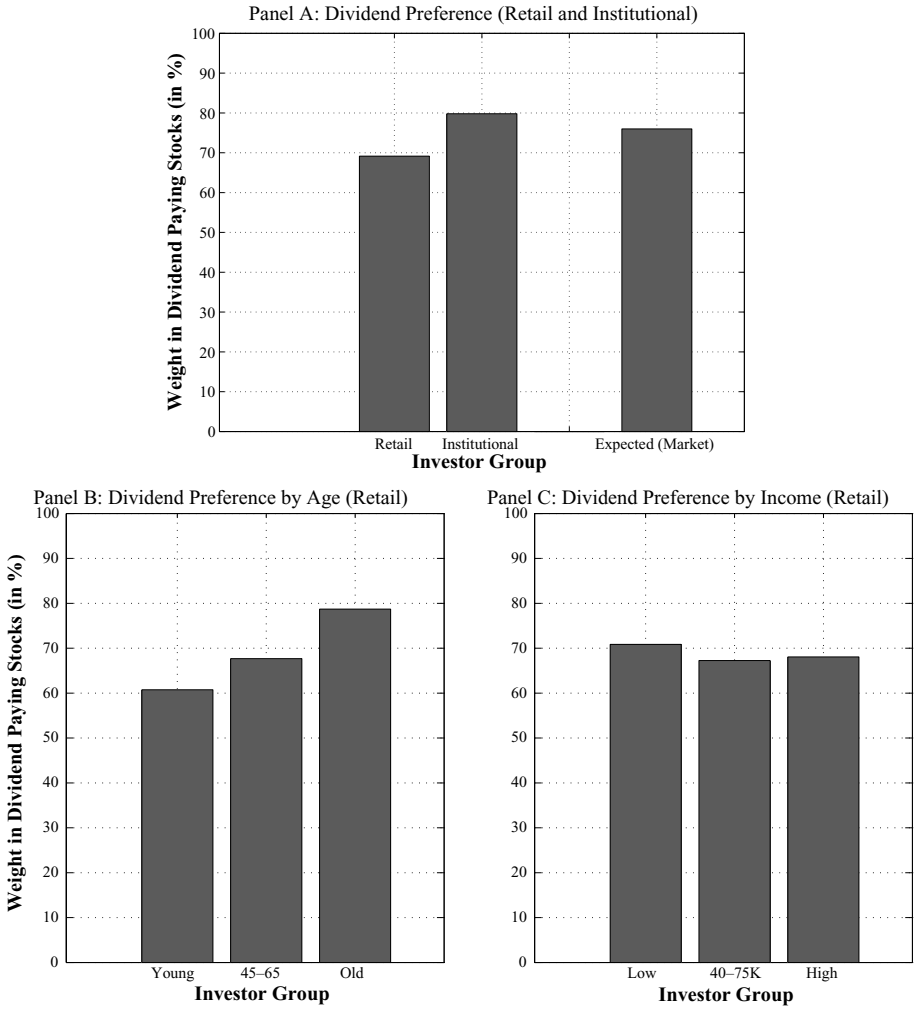


**Figure 1. Retail and institutional holdings of dividend paying stocks.** Panel A shows the sample period average weight in dividend paying stocks for the aggregate retail investor portfolio (as measured by the total holdings of 62,387 retail investors in our sample) and for the aggregate institutional portfolio. The sample period average weight in dividend paying stocks in the market portfolio (expected weight) is also reported. Panels B and C show the total portfolio weights (in percent) in dividend-paying stocks in portfolios for age and income groups, respectively. An aggregate portfolio is constructed for each investor group at the end of each month by combining the portfolios of all retail investors in that category. The portfolio weights in dividend-paying stocks are computed at the end of each month and the yearly averages of these monthly weights are reported. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996 while the institutional holdings data are from Thomson Financial.

the magnitude is greater for high-yield stocks (2.49% and 5.59%, respectively). In contrast, institutional investors exhibit a mild preference for lower DY stocks (see Panel B) and exhibit an aversion to higher DY stocks: The excess normalized percent weights are 3.12% and −6.16% for low and high DY quintiles,

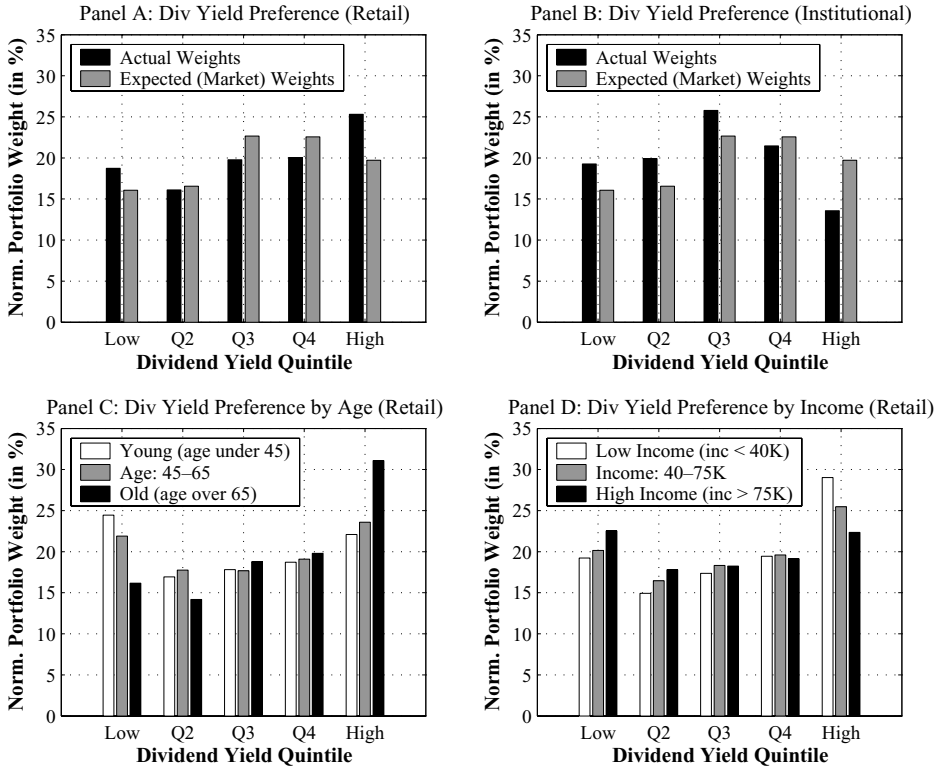


**Figure 2. Retail and institutional preferences for dividend yield.** The figure shows the aggregate preference of retail and institutional investors for dividend yield, within the set of dividend-paying stocks. In addition, for two groups of retail investors (age and income groups), the preference measures for dividend yields within the set of dividend-paying stocks are shown. An aggregate portfolio is constructed for each investor group at the end of each month by combining the portfolios of all retail investors in that category. The DY quintiles are formed at the end of each year using the total dividend payments in the previous year and the stock price at the end of the previous December. The portfolio weight assigned to stocks in a DY quintile is computed at the end of each month and the yearly averages of these monthly weights are reported. Panel A shows the normalized portfolio weights (in percent) of dividend yield quintiles in the aggregate retail portfolio, where the total portfolio weight in dividend-paying stocks is used as the normalizing variable. Panel B shows the same for the aggregate institutional portfolio. Panels C and D show the normalized portfolio weights of dividend yielding quintiles in age-based and income-based group portfolios, respectively. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996.

respectively.[14] The preference for both low and high DY stocks suggests that there could be heterogeneity in the dividend preferences of retail investors, with some retail investors preferring low DY stocks and others preferring high DY stocks. In other words, distinct dividend clienteles may exist within the class

[14] These univariate results must be interpreted with caution. The investor dividend preferences revealed through this analysis may in fact reflect investor preferences for risk or some other stock characteristic (e.g., small-cap, large-cap, growth, value, etc.) that is correlated with DY. We attempt to control for these characteristics in the multivariate analysis that follows.

of retail investors. In the next section, we examine the cross-sectional heterogeneity in the dividend preferences of retail investors to search for dividend clienteles.

### *B. Heterogeneity in Dividend Preferences of Retail Investors*

We begin by defining investor groups based on age and income. We assume that annual household income is a proxy for investors' marginal tax rates, and that the age of the head of the household is a proxy for consumption or regret avoidance preferences. Six nonmutually exclusive investor groups are formed, three groups each on the basis of age and income. The groups formed by sorting on age are (i) below 45 years (younger), (ii) between 45 years and 65 years, and (iii) above 65 years (older). The three income groups are (i) annual household income below \$40K (low-income), (ii) between \$40 and \$75K, and (iii) above \$75K (high-income). We interpret low (high) income as measuring low (high) tax rates.[15]

Next, the portfolios of all investors within a given group (e.g., older investors) are combined into a group level portfolio. Finally, for each investor group, we examine their overall dividend preferences (i.e., their preference for dividend paying stocks relative to nondividend paying stocks) as well as their preference for dividend yields (i.e., within the set of dividend paying stocks, their preference for stocks in different DY quintiles).

Figure 1 (Panels B and C) reports the actual portfolio weights (in percent) in dividend paying stocks for the six retail investor groups. Our results indicate that relative to the aggregate retail investor group and relative to younger investors, older investors allocate a greater proportion of their equity portfolios to dividend paying stocks. Comparing the portfolio weights of the three income groups, we find that relative to high-income investors, low-income investors exhibit a marginally stronger preference for dividend paying stocks.

To examine the relations between both age and income, and portfolio dividend yield, we compute the normalized weights in DY quintiles for age and income, where the investor groups are formed in the manner described above. The results are reported in Figure 2 (Panels C and D). We find that older investors assign a greater proportion of their portfolio to high-yield stocks—the difference between the normalized weight in high and low DY stock categories is 14.93% for older investors. Similarly, investors in the low-income group assign a greater weight to high-yield stocks—the difference between the weight in high and low DY stock categories is 9.79%. Interestingly, within the age and income groups, the relative preference for DY is monotonic. That is, across the DY quintiles, the "old versus young" relative preference for dividends increases

[15] The income variable is an imperfect marginal tax rate proxy because it could measure a tax effect, a consumption effect, or a combination of the two. In Section II.C, we isolate these two income-related effects.

with DY. A similar pattern is observed for "low-income versus high-income" dividend preferences.

Taken together, our results suggest that dividends influence the portfolio choices of retail investors, and that these choices vary with age and income. Older investors with low income exhibit the strongest preference for dividend paying stocks, and within the set of dividend paying stocks, they exhibit the strongest preference for dividend yield.[16] These results are consistent with the existence of dividend clienteles based on income levels (marginal tax rates) and age (consumption desires).

### *C. Isolating the Effects of Taxes on Dividend Preferences*

Thus far we have focused on dividend preferences related to age and income, the latter of which we interpret as a tax effect. We acknowledge, however, that the income result could measure a tax effect, a consumption effect (in which low-income investors like dividends for consumption purposes), or a combination of the two. In this section, we compare taxable and tax-deferred accounts, in an attempt to isolate tax effects from possible income/consumption effects.

Many investors in our sample hold retirement accounts.[17] Investors may hold high DY stocks in these tax-deferred accounts to maximize after-tax returns. For example, young, wage-earning investors may have a lesser need to realize dividends to fund consumption, and focus instead on dividend tax consequences. These investors may choose to hold high-yield stocks in tax-deferred accounts to shelter the dividend payments from taxes. In contrast, the tax incentive to hold high dividend stocks is small or nonexistent for older investors. Therefore, we expect little, if any, difference in DY in older investors' taxable and tax-deferred accounts.

To examine whether taxes affect in which accounts dividends are held, taxable or tax-deferred, we divide younger investors into two groups, namely, those who hold only taxable accounts, and those who hold only tax-deferred accounts. We similarly partition older investors. Consistent with the evidence in Barber and Odean (2004), averaging over all investors, we find that the average annual portfolio dividend yield (PDY) of investors with tax-deferred accounts is marginally greater (average difference = 0.32%) than investors with taxable accounts.[18] However, this small average difference masks important differences that appear to be tax driven.

Within the group of younger investors, for whom taxes are most likely to matter, high-dividend stocks are held in tax-deferred accounts (average

[16] The results from double sorts on age and income are not reported but are available upon request.

[17] Approximately 42% of the accounts in our sample are retirement accounts (IRA or Keogh). There are 158,031 accounts in our sample, including 64,416 IRA and 1,299 Keogh accounts. A typical household holds multiple accounts—out of 77,995 households in our sample, 43,706 hold at least one retirement account.

[18] See the Appendix for details on the portfolio DY (PDY) measure.

tax-deferred versus taxable annual DY differential = 0.96%). This evidence is consistent with younger investors using tax-deferred accounts to shelter dividend income from taxes. In contrast, for older investors, for whom taxes are of minimal concern, PDY for taxable accounts is indistinguishable from PDY for tax-deferred accounts (average annual DY differential = 0.08%). Overall, the contrast between young and older investors is consistent with tax incentives affecting dividend decisions.[19]

### *D. Impact of 1993 Marginal Tax Rate Changes on Dividend Preferences*

In 1993, the Revenue Reconciliation Act increased tax rates for high-income individuals. The marginal tax rate increased from 31% to 36% (39.6%) for individuals with annual taxable income of at least $140,000 ($250,000). Individuals in other income brackets were unaffected by this legislation. To examine the impact of the tax rate changes on the dividend preferences of retail investors, we perform an event study. Investors who hold taxable accounts only (10,969 investors) are divided into two groups based on their annual household income, specifically, investors with income below $125,000 (9,695 investors), and investors with income above $125,000 (1,274 investors). For each of these groups, we measure the average change in the PDY relative to December 1992 levels. Given that the 1993 tax rate changes affect only wealthy investors, we expect only the second group of investors to respond to the changes in marginal tax rates.

Figure 3 shows the average changes in PDY from December 1992 levels for the two groups of investors. One year after the event, the average decrease in PDY is 11.65% (18.16%) for investors with income below $125,000 (over $125,000). The difference of 6.51% is statistically significant at the 1% level. Two years after the event month, the average decrease in PDY is 1.54% for investors with income below $125,000 and again, the decrease is considerably greater (15.10%) for investors with income over $125,000. The difference of 13.56% is statistically significant at the 1% level.[20] This evidence suggests that taxes are an important determinant of retail investors' dividend preferences. Consistent with the tax hypothesis, the 1993 marginal tax rate changes influenced the

[19] The results are similar when we control for the effects of income. Within the set of low-income investors, the average tax-deferred versus taxable PDY differentials are 1.20% and 0.12% for younger and older investor groups, respectively. Similarly, within the set of high-income investors, the average tax-deferred versus taxable PDY differentials are 0.88% and 0.04% for younger and older investor groups, respectively.

[20] To isolate whether the changes in Figure 3 are driven by taxes, we also examine tax-deferred accounts. We do not expect the tax rate changes to affect PDY in tax-deferred accounts. Consistent with this expectation, we find that the differential between PDY changes for investors in the two income groups (investors with income above $125,000 and others) is −0.15% after 1 year and 0.19% after 2 years. These figures are not statistically different from zero. Because we do not find statistical changes in the tax-deferred accounts, this suggests that the changes in Figure 3 are in fact tax-driven.

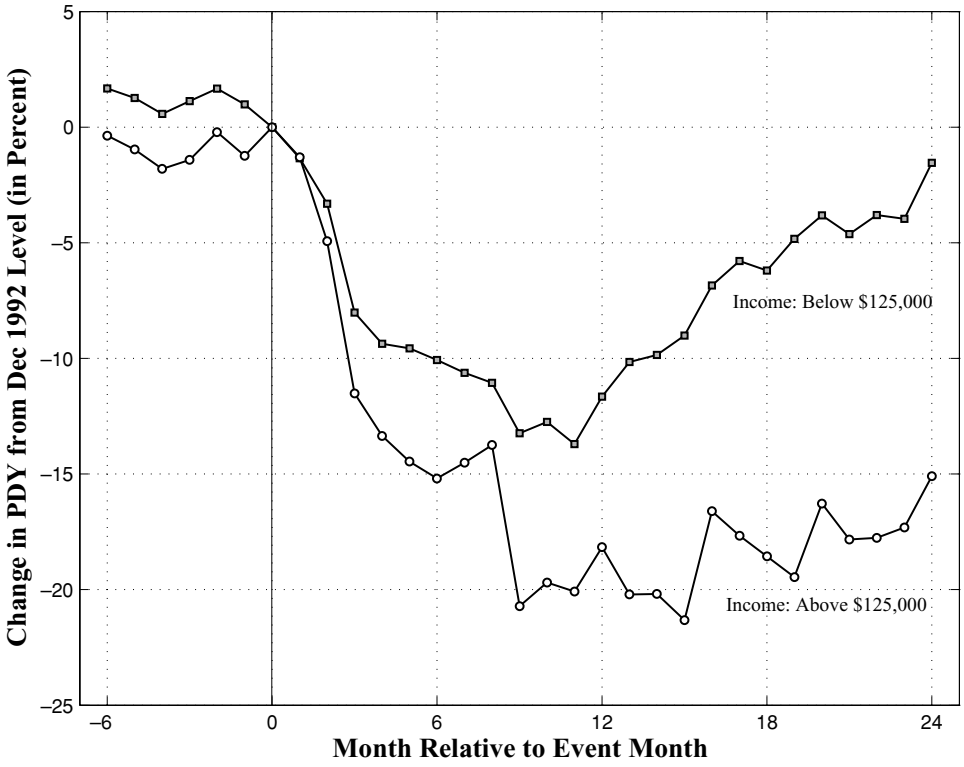


**Figure 3. Effect of 1993 tax rate increase on portfolio dividend yield (PDY).** This figure shows the impact of 1993 tax-rate increase for wealthy investors on the average PDY of taxable accounts. The top line depicts investors with income below $125,000, and the bottom line depicts investors with annual income above $125,000. The portfolio dividend yield of a given portfolio is measured as the weighted average of the dividend yields of all stocks in the portfolio. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996.

dividend choices of the subset of retail investors for whom tax rates increased the most.[21] Also, these results lend credibility to our using income brackets to proxy for tax effects.[22]

[21] To examine whether age might confound our results, we perform the event study separately for younger and older investors. The results are qualitatively similar to those shown. As an additional robustness check, by performing the event study using purchases (instead of end-of-month portfolio holdings), we examine whether investors with income over $125,000 actively reduced the PDY of their portfolios after 1993. The trade-based results are qualitatively similar to (albeit slightly weaker than) the results discussed in the text.

[22] Our results are very similar when we adjust investors' PDY measures using the market DY. For instance, 1 year after the event month, the difference between the average declines in the adjusted PDY of the two income groups is 6.92%. Two years after the event month, this difference is 14.11%. Both the differences are statistically significant at the 1% level. This suggests that our results are not mechanically induced by changes in the market DY during the 1993 to 1996 time period.

*E. Multivariate Regression Tests*

To further explore the dividend preferences of retail investors and to estimate the relative strengths of age and tax effects, we estimate a multivariate regression in which the dependent variable is the average annual PDY of a household. That is, there is one observation per household in the regression model. Variables that characterize household demographics and portfolio characteristics are used as independent variables.

In the regression specification, *Income* is the total annual household income and *Age* corresponds to the head of the household. The *Professional* and *Retired* dummy variables represent occupation categories, where the professional job category includes investors who hold technical and managerial positions. The remaining investors belong to the nonprofessional category, which consists of students, nonworking spouses, blue-collar workers, sales and service workers, and clerical workers. The tax-deferred account dummy (*TDA Dummy*) is set to one if the household equity portfolio consists of only tax-deferred accounts. *Portfolio Turnover* is the sample period average of monthly buy and sell turnovers, *Portfolio Size* is the sample period average market capitalization of the household portfolio, and *Portfolio Performance* is the Sharpe ratio of the household portfolio measured over the 6-year sample period. The *RMRF, SMB, HML,* and *UMD Loadings* are the factor exposures of the household portfolio obtained by fitting a four-factor model to the monthly household portfolio returns series over the period the household is active.[23] The factor exposures measure the systematic risk of an investor's portfolio and also serve as controls for an investor's style preference. *Portfolio Idiosyncratic Risk* is the variance of the residual from the four-factor model. To control for industry effects, for each investor, we use end-of-month portfolio positions to compute the sample period average portfolio weights (or concentration) in 48 Fama–French industries (Fama and French (1997)) as well in NASDAQ stocks. The coefficient estimate of the *NASDAQ Concentration* variable is reported, but for brevity, the coefficient estimates of the Fama–French industry concentration variables are suppressed.[24]

The estimation results are presented in Table II (columns 1 and 2). The regression estimates provide evidence consistent with retail dividend clienteles. *Age* has a positive and significant coefficient estimate (0.024 with a $t$-stat of 6.28), as does the *Retired Dummy* (0.326 with a $t$-stat of 2.14). Taken together, these coefficient estimates indicate that older investors prefer dividends, holding all else constant. We interpret these findings as evidence of an age-driven dividend clientele, such that older investors prefer high-yield stocks, perhaps because they have greater consumption needs.

The coefficient estimate of *Income* (marginal tax rate proxy) provides evidence consistent with a tax-induced retail dividend clientele. The coefficient estimate is negative and statistically significant ($-0.002$ with a $t$-stat of $-2.76$), which suggests that low-income investors (with lower marginal tax rates) are likely to hold high-yield stocks. Importantly, the relation between PDY and

[23] Households with less than 12 months of return data are excluded from this analysis.

[24] These estimated coefficients are available upon request.

**Table II**

## Regression Analysis Explaining Household Portfolio Dividend Yield

This table reports the estimates of cross-sectional regressions. The average portfolio dividend yield of a household is the dependent variable (one observation per household) and household characteristics are used as independent variables. The estimates for three different subsamples are presented: (i) all investors in the sample (columns 1 and 2), (ii) investors with portfolio size to annual income ratio (SIR) $\geq 1$ (column 3), and (iii) all investors except those located in California (column 4). Among the independent variables, *Income* is the total household income and *Age* corresponds to the head of the household. The *Professional* and *Retired* dummy variables represent occupation categories, where the professional job category includes investors who hold technical and managerial positions. The remaining investors belong to the nonprofessional category. *TDA Dummy* is set to one if a household holds only tax-deferred accounts. *Portfolio Turnover* is the average of monthly buy and sell turnovers, *Portfolio Size* is the average market capitalization of the household portfolio, and *Portfolio Performance* is the Sharpe ratio of the household portfolio measured over the 6-year sample period. *NASDAQ Concentration* for an investor is the sample period average portfolio weight (or concentration) in NASDAQ stocks. The sample period average portfolio weights (or concentration) in 48 Fama–French industries are also included as independent variables, but for brevity, the coefficient estimates are not reported. The *RMRF, SMB, HML,* and *UMD Loadings* are the factor loadings of an investor's portfolio. These loadings are obtained by fitting a four-factor time-series model to the monthly portfolio returns series of each investor over the period the investor is active and *Portfolio Idiosyncratic Risk* is the variance of the residual from the four-factor model. The *t*-statistic for the coefficient estimate is reported in parentheses below the estimate. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996.

| Dependent Variable: Average Annual Portfolio Dividend Yield in Percent (One Observation per Household) | | | | |
|---|---|---|---|---|
| | All Investors | | Large Portfolios (SIR $\geq 1$) | Excluding California Investors |
| Intercept | 0.086 | 0.709 | 0.838 | 0.821 |
| | (2.714) | (3.904) | (2.687) | (2.999) |
| *Age* | 0.047 | 0.024 | 0.017 | 0.021 |
| | (10.616) | (6.281) | (3.369) | (4.654) |
| *Income* | −0.003 | −0.002 | −0.001 | −0.002 |
| | (−4.095) | (−2.761) | (−2.342) | (−2.705) |
| *Professional Dummy* | −0.035 | 0.026 | 0.026 | 0.076 |
| | (−0.322) | (0.256) | (0.180) | (0.642) |
| *Retired Dummy* | 0.651 | 0.326 | 0.420 | 0.358 |
| | (3.744) | (2.137) | (2.275) | (2.051) |
| *TDA Dummy* | 0.819 | 0.525 | 0.427 | 0.450 |
| | (5.397) | (2.194) | (1.930) | (3.021) |
| *Portfolio Turnover* | | −0.022 | −0.021 | −0.028 |
| | | (−3.511) | (−3.280) | (−4.568) |
| *Portfolio Size* | | 0.002 | 0.001 | 0.001 |
| | | (3.101) | (2.694) | (2.938) |
| *Portfolio Performance* | | 0.005 | −0.001 | 0.007 |
| | | (2.194) | (−0.274) | (2.230) |
| *Portfolio Idiosyncratic Risk* | | −0.016 | −0.013 | −0.016 |
| | | (−10.503) | (−6.461) | (−8.555) |
| *RMRF Loading* | | −0.877 | −1.252 | −0.947 |
| | | (−9.547) | (−8.796) | (−8.718) |
| *SMB Loading* | | −0.963 | −1.274 | −0.963 |
| | | (−11.002) | (−10.379) | (−9.250) |
| *HML Loading* | | 1.712 | 1.961 | 1.785 |
| | | (23.815) | (18.072) | (21.080) |
| *UMD Loading* | | −0.467 | −0.499 | −0.446 |
| | | ( −7.014) | (−4.807) | (−5.658) |
| *NASDAQ Concentration* | | −6.686 | −6.974 | −6.648 |
| | | (−36.944) | (−28.055) | ( −30.798) |
| Number of cases | 22,808 | 11,985 | 6,466 | 9,221 |
| Adjusted $R^2$ | 4.12% | 44.13% | 51.96% | 42.43% |

income holds even in the presence of a variety of control variables. Furthermore, the *TDA Dummy* has a positive coefficient (0.525 with a $t$-stat of 3.92), which suggests that investors hold higher-yield stocks in tax-deferred accounts, all else equal. This indicates that the dividend preferences of investors are influenced by tax considerations, after controlling for income and consumption effects.[25]

The other coefficient estimates are either consistent with previous findings or intuitive. For instance, larger portfolios have higher-dividend yields, which is consistent with the findings in Scholz (1992). The negative coefficient estimate of *Portfolio Turnover* indicates that investors who hold a high-yield portfolio trade less frequently. Perhaps investors who use dividend income as a source of regular income are likely to hold high DY stocks longer and thus they may trade infrequently. The *NASDAQ Concentration* variable has a negative coefficient estimate, which is expected because NASDAQ stocks typically have zero or low DY. Finally, though not shown in the table, the coefficient estimate for the "Utilities" industry is large and significant (0.289 with a $t$-stat of 25.86).[26]

To investigate whether one clientele dominates, we examine the shift in the annual DY corresponding to a one-standard deviation shift in the age and income variables. The age and income variables have standard deviations of 12.82 and 64.55, respectively. A one-standard deviation shift in *Age* corresponds to a 0.308% shift ($0.024 \times 12.82 = 0.308$) in annual PDY, while a one-standard deviation shift in *Income* corresponds to a $-0.129$% shift ($-0.002 \times 64.55 = -0.129$). This indicates that PDY is more sensitive to the age of the head of the household, and hence the age clientele appears to be dominant.

### *F. Additional Regression Tests*

For robustness, we estimate the PDY equation for two subsamples. In the first case, we consider investors with a mean portfolio size to annual income ratio (i.e., SIR) greater than or equal to one. The equity portfolios of these investors are unlikely to represent a "play money" account. In the second subsample, we delete all investors who reside in California. A considerable portion (27.25%)

[25] We estimate the regression model separately for subgroups of investors who hold only taxable accounts and those who hold only tax-deferred accounts. Consistent with the clientele effects, we find that the coefficient estimates of *Age*, *Income*, and *Retired Dummy* are statistically significant for the set of investors with taxable accounts (the estimates are 0.066, $-0.005$, and 0.090, respectively, and the corresponding $t$-statistics are 5.572, $-2.348$, and 2.182), while the estimates are statistically insignificant for the set of investors with tax-deferred accounts. Given potential concerns about the reliability of the demographic information, we also estimate the basic DY regression for investor groups based on account age. For account age quintile 1, the coefficient estimates ($t$-statistics) for *Age*, *Income*, *Professional Dummy*, *Retired Dummy*, and *TDA Dummy* are 0.047 (6.692), $-0.002$ ($-2.609$), 0.183 (1.087), 0.919 (3.051), and 0.356 (2.455), respectively. The coefficient estimates and $t$-statistics are very similar for account age quintile 5: 0.047 (6.130), $-0.002$ ($-2.529$), 0.156 (0.776), 1.224 (4.320), and 1.080 (4.375), respectively.

[26] We also experiment with a few other explanatory variables such as home-ownership (a wealth proxy), gender, family size (a proxy for consumption needs), and marital status. The coefficient estimates for all these new variables are statistically insignificant and more importantly, the coefficient estimates for the other variables are virtually unchanged.

of our sample is located in California, and we want to guard against the possibility that our results could be affected by California investors (particularly the younger investors) who may have a strong preference for technology stocks during the sample period. The results are reported in Table II (columns 3 and 4). We find that the subsample coefficient estimates are very similar to the full-sample results. This evidence indicates that our results are robust to concerns about "play money" and industry preferences of California residents.

We also estimate a separate specification to isolate the impact of the 1993 marginal tax rate changes. In this specification, we use a panel of data, with up to six observations per investor. The dependent variable is the annual DY of an investor's portfolio, and the independent variables include the independent variables from our previous regression model and a high-income $*$ post-1992 dummy variable. The dummy variable is set to one if an investor belongs to the highest-income group (income $>$ \$125,000) and the year is 1993, 1994, 1995, or 1996. If the marginal tax rate increase for the high-income individuals affected their dividend preferences, the coefficient estimate of the high-income $*$ post-1992 dummy should be negative. Though not shown in the table, the estimated coefficients for age and income are virtually unchanged. More importantly, the estimated coefficient on the high-income $*$ post-1992 dummy is negative ($-0.311$ with a $t$-stat of $-2.898$). This indicates that, on average, the annual DY of high-income investors decreased by $-0.311\%$ after the 1993 marginal tax rate change, which is consistent with taxes affecting dividend preferences.

We perform one final regression to determine the factors that affect a particular stock's ownership. We estimate a pooled regression model at the end of each month, where the dependent variable is the stock ownership of an investor (measured using the portfolio weight) at the end of the month. The independent variables include the independent variables in Table II, plus the DY of the stock, DY interacted with age (DY $*$ Age), and DY interacted with income (DY $*$ Income). These interactive terms are the variables of interest because the goal of this specification is to determine whether a stock is more likely to be held by older investors (or less wealthy investors) when DY is high. We find that the average monthly coefficient estimate of the DY $*$ Age variable is 0.049 ($t$-stat $=$ 7.37) and the average monthly coefficient estimate of the DY $*$ Income variable is $-0.035$ ($t$-stat $= -5.73$). These results reinforce our evidence on dividend clienteles: The ownership of a given stock by older and low-income investors increases with DY.

Overall, the regression estimates show that in our sample of retail investors, the preference for dividends varies with age and taxes. The marginal contributions of these two variables are significant even after we control for the effects of a wide array of variables such as portfolio risk, trading frequency, and industry preferences. The influence of clientele variables on PDY is significant both statistically and economically.[27] These results are consistent with Poterba and

[27] Even though our evidence is consistent with the existence of retail investor dividend clienteles, we entertain the possibility that a much simpler mechanism is at play. It is conceivable that portfolios for some investors have high dividend yields simply because they buy lower-priced stocks

Samwick (2002), who show that U.S. households consider their marginal tax rates when making broad asset allocation decisions.

## III. Trading Behavior around Dividend Events

Thus far our results are based primarily on portfolio holdings. We now turn to trading activity. We examine the trading activities of groups of retail investors formed on the basis of age and income. If active retail dividend clienteles exist, investor groups might exhibit abnormal trading activities consistent with their dividend preferences around salient dividend events. For instance, older investors or those with low income (and lower marginal tax rates) might buy a stock prior to the ex-dividend date, or sell following the ex-date. We use demographic information (age and income) along with signed volume to investigate whether clientele trading exists.

Because factors other than taxes and consumption needs are likely to induce trading around dividend events, detecting clientele trading might be difficult. For instance, investors' reluctance to realize losses (e.g., Odean (1998)) may lead to a muted sell reaction around dividend events, even if clientele effects predict net selling by retail investors. Furthermore, the salient nature of dividend events may induce retail investors to engage in attention-driven buying (e.g., Lee (1992), Barber and Odean (2001)). However, by comparing abnormal volume reactions between the pre-event and post-event periods, and cross-sectionally across investor groups, we attempt to isolate clientele trading.

We consider four types of dividend events: (i) ex-dividend days, (ii) dividend announcements, (iii) dividend initiations, and (iv) dividend omissions. For each investor group, first we compute the daily (or monthly) buy–sell imbalance (BSI) in a $k$-day (or $k$-month) event window around these events. The BSI of investor group $i$ for stock $j$ on day $t$ (or in month $t$) is defined as

$$\mathrm{BSI}_{ijt} = \frac{B_{ijt} - S_{ijt}}{B_{ijt} + S_{ijt}} \times 100, \tag{1}$$

where $B_{ijt}$ is the total buy volume of group $i$ for stock $j$ on day $t$ (or in month $t$) and $S_{ijt}$ is the total sell volume of group $i$ for stock $j$ on day $t$ (or in month $t$). Next, we compute the excess (or abnormal) buy–sell imbalance (EBSI) of investor group $i$ for stock $j$ on day $t$ by subtracting the expected (or normal) level of BSI, where the expected BSI for group $i$ and stock $j$ is the average of the BSI levels on days $t - 20$ to $t - 16$ and days $t + 16$ to $t + 20$;[28] that is,

and exhibit a greater propensity to hold on to those stocks when they suffer losses. In other words, the high portfolio yields we observe could be due to the reluctance of retail investors to realize losses, that is, the disposition effect (e.g., Shefrin and Statman (1985), Odean (1998)). To study this possibility, we examine the relation between the disposition effect (DE) and portfolio dividend yield (PDY). We find that DE is negatively correlated with PDY (correlation = −0.11). This indicates that the PDY is higher for investors who are less likely to hold on to their losses. Therefore, the relation between the DE and DY is the opposite of what would be required for the disposition effect to be responsible for our clientele results.

[28] The results are robust to changing the number of days used to define expected BSI.

$$\text{EBSI}_{ijt} = \text{BSI}_{ijt} - \overline{\text{BSI}}_{ij}. \quad (2)$$

Finally, on each day (or each month) within the event window, for each event type and for each investor group, we obtain an equally weighted average of group-level BSIs across all events within an event type.

### *A. Ex-dividend Days*

The 2,775 dividend paying stocks in our sample make 54,457 quarterly cash dividend payments during the sample period. Table III reports the average

**Table III**
**Trading Activity around Ex-dividend Days**

This table reports the average excess buy–sell imbalance (BSI) of groups of retail investors around ex-dividend dates. Investor groups are formed by sorting on age and income. The BSI is the ratio of the net buy imbalance (Buy Volume − Sell Volume) and the total volume (Buy Volume + Sell Volume) on a given day. The excess BSI is obtained by subtracting the expected level of BSI where the expected BSI is the average of BSI levels on days $t - 20$ to $t - 16$ and days $t + 16$ to $t + 20$. $t$ is the ex-dividend date. Equal-weighted averages (average is taken across all events) of BSIs are reported for the event date and for four time periods around the ex-dividend date. In Panel A, we report the results for all dividend-paying stocks in our sample and in Panel B, we report the results for high dividend yield (top quintile) stocks. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996. * and ** denote significance at the 5% and 1% levels, respectively.

| Investor Group | −10:−6 | Pre-event −5:−1 | Event Day 0 | Post-event +1:+5 | +6:+10 | Ev − Pre | Post − Pre |
|---|---|---|---|---|---|---|---|
| Panel A: Ex-day Activity for All Dividend Paying Stocks | | | | | | | |
| All investors | −0.81 | 3.51 | 2.22 | 3.22 | 0.78 | −1.29 | −0.29 |
| Age groups | | | | | | | |
| Below 45 (Younger) | −0.88 | −0.76 | 4.41 | 1.29 | −0.02 | 5.17** | 2.05* |
| 45–65 | −1.36 | 3.43 | −3.61 | 2.32 | 1.37 | −7.05** | −1.12 |
| Above 65 (Older) | 2.26 | 4.10 | −1.58 | −0.73 | −0.74 | −5.68** | −4.83** |
| Older − Younger | 3.14** | 4.86** | −5.99** | −2.45** | −0.72 | −10.85** | −6.88** |
| Income groups | | | | | | | |
| Below 40K (Low) | 1.69 | 6.61 | 2.17 | 2.96 | 2.04 | −4.41** | −3.65** |
| 40–75K | −0.54 | 1.47 | −2.17 | 1.46 | −0.50 | −3.64** | −0.01 |
| Above 75K (High) | −1.49 | 1.12 | 0.17 | 0.74 | −0.81 | −0.94 | −0.38 |
| Low − High | 3.18** | 5.49** | 2.00* | 2.22* | 2.85** | −3.47** | −3.27** |
| Panel B: Ex-day Activity for High Dividend Yield (Top DY Quintile) Stocks | | | | | | | |
| All investors | 0.07 | 7.85 | 7.01 | 7.49 | 3.87 | −0.84 | −0.36 |
| Age groups | | | | | | | |
| Below 45 (Younger) | −2.48 | 2.77 | 6.56 | 6.27 | 1.29 | 3.79** | 3.49** |
| 45–65 | −1.03 | 8.17 | 7.01 | 7.43 | 5.17 | −1.16 | −0.74 |
| Above 65 (Older) | 6.40 | 13.26 | 1.17 | 1.20 | 2.66 | −12.09** | −12.06** |
| Older − Younger | 8.88** | 10.48** | −5.39** | −5.06** | 1.37 | −15.87** | −15.55** |
| Income groups | | | | | | | |
| Below 40K (Low) | 4.01 | 16.45 | 10.25 | 3.92 | 4.15 | −6.20** | −12.53** |
| 40–75K | 1.84 | 7.41 | 3.45 | 6.02 | 5.43 | −3.95** | −1.39 |
| Above 75K (High) | −5.59 | 1.11 | 2.50 | 4.35 | 1.78 | 1.39 | 3.24** |
| Low − High | 9.61** | 15.33** | 7.75** | −0.43 | 2.37* | −7.58** | −15.77** |

EBSI of different groups of investors around ex-dividend days.[29] In Panel A, we report EBSI for all ex-days, and in Panel B we report EBSI for high (top quintile) DY stocks. For the entire group of retail investors, EBSI is positive on the ex-day (EBSI = 2.22), as well as in the week prior (3.51) and the week following (3.22) the event. The uniformly positive EBSI might indicate that different groups of investors are active before, on, and after the ex-dividend dates.

Examining the EBSI of the three age groups around ex-days, we find that younger investors are net buyers on the ex-date and during the week following the event. The difference between ex-day EBSI and pre-event week EBSI is positive and statistically significant (EBSI differential = 5.17). In contrast, older investors are net buyers in both weeks prior to the ex-day (EBSI =2.26, 4.10) but not on the ex-dividend date and the week following. The EBSI differentials between the ex-day and pre-event week, and between the post-event week and pre-event week, are both negative and statistically significant (−5.68, −4.83). Overall, this trading activity indicates that on average older investors buy dividends prior to the ex-date, while young investors wait until after the dividend is assigned. These results are consistent with age-driven clientele trading. The results are somewhat surprising because they suggest a degree of trading sophistication and activity not normally assumed for retail investors.[30]

The trading activities of the three income groups are also consistent with the prediction of the clientele hypothesis, though the evidence is somewhat weaker. For the low-income group, consistent with the clientele hypothesis, there is relatively more buying prior to the ex-date: The difference between ex-day (post-event week) EBSI and pre-event week EBSI is −4.41 (−3.65), which is statistically significant. The pre-event EBSI for low-income investors is also stronger relative to buying by high-income investors. Overall, these results are consistent with low-income (low tax rate) investors buying dividends in the week prior to the ex-day and are consistent with tax-induced retail investor dividend clientele trading. Panel A results also indicate that low-income investors continue to pursue dividends more aggressively than do high-income investors, even after the ex-day (though less so than before the ex-day).

[29] Our ex-dividend day results are based on 237,660 trades (126,744 buys, 110,916 sells) executed in a 10-day window around the ex-days. Out of 54,457 events, investors in our sample trade around 20,519 events (37.68%), for which they execute on average 11.58 trades per event. The BSI is only computed for days on which at least five investor trades occurred.

[30] Odean (1998, 1999), and Barber and Odean (2000) argue that, on average, the retail investors in our sample are not sophisticated, primarily because they trade too frequently and exhibit the disposition effect. However, note that these authors primarily study average behavior across the sample, while we focus on cross-sectional variation in behavior. Note also that Coval, Hirshleifer, and Shumway (2001) suggest that these investors may have market timing and stock selection abilities, Ivković and Weisbenner (2005) suggest that these investors have better information about geographically proximate stocks, and Goetzmann and Kumar (2004) show that a group of active investors earns superior risk-adjusted performance. Finally, Ivković, Poterba, and Weisbenner (2005) show that, once controlling for the disposition effect, these investors conduct sophisticated tax-loss selling. Taken together, these results make our evidence of sophisticated ex-day trading less surprising.

Examining trading behavior for high-yield stocks (Panel B), we find a stronger volume reaction, which is where one would expect to find the active pursuit of dividends. Both older and low-income investors are net buyers of high-yield stocks in the weeks prior to the event date. The EBSI differential between the ex-day and the pre-event week is −12.09 (−6.03) for older (low-income) investors, while the EBSI differentials between the post-event week and the pre-event week are −12.06 and −12.53. These results are consistent with clientele activity around ex-dividend days. Note also that there is more buying around ex-dates of high-yield stocks among all investor groups. This is consistent with the attention hypothesis (which we examine in more detail in Section III.C).

To examine whether investors benefit from their trading activities around ex-dates, we compute the average tax savings per trade. We examine buy and sell trades separately. For buy trades, we measure the average potential tax savings for investors when they purchase the stock in a 20-day window before the ex-date rather than on or after the ex-date. Similarly, to measure the potential tax savings from their sell trades, we consider sales for which investors realize long-term capital gains (we assume that the stock is held at least 1 year) in a 20-day window following the ex-date. We measure the average potential tax savings corresponding to these trades in comparison to their decision to execute the trades before the ex-date. We also examine whether the tax savings that correspond to investors' buying and selling decisions are larger for higher DY (top three decile) stocks.

The results indicate that on average investors save from their buying (selling) decisions.[31] While the tax savings are less than a dollar for low-dividend stocks, the savings average $6.60 and $6.37 per trade, respectively, for buys and sells of high DY stocks. Moreover, the tax savings vary with the tax sensitivity of the investor. For low-income investors, the savings are less than $2 per trade for low-dividend stocks but average $16 per trade for high-yield stocks. Furthermore, the average tax savings per trade is about $25 for over one-fourth of the trades and more than $50 for roughly one-tenth of the trades. In contrast, older investors, who are likely to prefer consumption-financed dividends to tax savings, have near-zero tax savings from their trades around ex-days. Collectively, these results suggest that low-income (low marginal tax rate) investors are likely to benefit from the timing of their ex-day trading activities, especially among high DY stocks.

### *B. Ex-day Premium and Retail Investor Characteristics*

Much of the ex-day literature assumes that retail investor characteristics are impounded into stock prices, and into the ex-day price drop in particular. If this does in fact occur, the effects might be most obvious among small-cap stocks, in which retail investors are more concentrated and therefore more likely to be the marginal price-setting investors (Kumar and Lee (2006)).

[31] Note that even "less than a dollar" and "$2" reported tax saving estimates are statistically significant ($p$-value $< 0.05$).

To investigate the relation between the ex-day premium and investor characteristics in our sample, we first compute the ex-day premium for each dividend payment event, where the ex-day dividend premium is defined as

$$PREM = \frac{P_{cum} - P_{ex}}{D}. \tag{3}$$

Here, $P_{cum}$ is the closing price of the stock a day before it goes ex-dividend, $P_{ex}$ is the closing stock price on the ex-dividend date, and $D$ is the amount of the dividend payment. Next, at the end of each month, for each stock, we compute the value-weighted average age (*Age*) and the average income (*Income*) of the stock's retail investor clientele. The ex-day premium and investor characteristics during a year are averaged to obtain yearly measures of the premium and investor characteristics. Finally, we estimate six pooled regressions with fixed year effects—one regression that pools all ex-day events and five others corresponding to the five size-quintiles, where the ex-day events within a given size-quintile are pooled together. The dependent variable in the pooled regression specification is the average ex-day premium of a given stock in a particular year, while the independent variables are the two clientele measures, namely, *Age* and *Income*.

In the absence of market frictions, the stock price drop on the ex-dividend day would equal the dividend payment and the ex-day premium would equal one (see equation (3)). However, Elton and Gruber (1970) argue that in the presence of frictions such as taxes, the ex-day premium reflects the marginal tax rates of the marginal investors. In general, the ex-day premium reflects the marginal investors' relative valuation of dividends in comparison to capital gains. The ex-day premium is lower if the marginal investors value dividends less than capital gains for tax reasons. If investors are indifferent between the two modes of payment, the ex-day premium is equal to one. If investors are willing to pay a premium for cash dividends, the ex-day premium may be greater than one.

We have already shown that older and low-income investors hold high DY stocks. These groups are likely to value dividends more than capital gains. So, if retail investor characteristics are impounded into ex-day stock prices, we would expect to find a positive relation between age and the ex-day premium and a negative relation between income (a proxy for marginal tax rates) and the premium.

Our results indicate that the average ex-day premium for stocks with younger investors (age deciles 1–3) is 0.670 and is higher (0.747) for stocks with older investors (age deciles 8–10). The difference of 0.077 is statistically significant ($t$-statistic = 5.45). Similarly, the average ex-day premium for stocks with a low-income clientele (income deciles 1–3) is 0.785, and it is lower (0.717) for stocks with a high-income investor clientele (income deciles 8–10). Again, the difference of 0.068 is statistically significant ($t$-statistic = 4.37). This evidence indicates that the ex-day premium increases with age and decreases with income, consistent with the clientele hypothesis.

**Table IV**
**Ex-day Premium and Retail Investor Characteristics**

This table reports the estimated coefficients from pooled regressions with fixed year effects. The dependent variable is the average ex-day premium (average taken over the year) for a given stock adjusted for market movements on the ex-day. The ex-day premium is defined as the ex-day price change (Cum-dividend price − Ex-dividend price) divided by the dividend payment. The independent variables are (i) *Age*, which is the value-weighted average age of retail stockholders of a given stock in a particular year, and (ii) *Income*, which is the value-weighted average household income of retail stockholders of a given stock in a particular year. The results under column "All" report the estimates for all dividend paying stocks, while columns Q1 to Q5 report the estimates for dividend-paying stocks in the five size-quintiles, respectively. The size-quintiles are formed at the end of previous year using the market capitalization at the end of December. The *t*-statistics for the coefficient estimates are reported in parentheses. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996.

| Dependent Variable: Ex-day Premium | | | | | | |
|---|---|---|---|---|---|---|
| | | Size-quintiles | | | | |
| Variable | All | Small | Q2 | Q3 | Q4 | Large |
| *Age /10* | 0.008 | 0.052 | 0.002 | 0.014 | −0.018 | 0.017 |
| | (1.73) | (2.84) | (0.11) | (0.71) | (−0.98) | (0.95) |
| *Income /1000* | 0.080 | −0.801 | −0.400 | 0.448 | 0.176 | −0.208 |
| | (−1.51) | (−2.40) | (−0.89) | (0.54) | (0.49) | (−0.71) |
| *N*(stocks) | 9,396 | 1,766 | 1,625 | 1,730 | 1,939 | 2,336 |
| Adjusted $R^2$ | 0.13% | 1.52% | 0.91% | 0.33% | 0.42% | 0.42% |

In Table IV, we report the estimation results for a pooled regression specification. The ex-dividend day price is adjusted using the market model (CAPM) to account for expected price movements. We find that the relations between the ex-day premium and investor characteristics have the expected signs but are statistically weak when all ex-day events are considered. The coefficient estimate of the *Age* variable is 0.008 ($t$-stat = 1.73) and the coefficient estimate of the *Income* variable is −0.080 ($t$-stat = −1.51). Thus, for stocks held predominantly by high tax rate investors, the premium is lower, which is consistent with clientele investors' tax characteristics being impounded into stock prices. The positive coefficient of the *Age* variable indicates that the ex-day premium is higher for stocks with greater ownership by older investors. That is, to make an older investor indifferent between buying a stock cum- versus ex-dividend, the ex-day price must be relatively high, and therefore the ex-day price drop must be correspondingly small.

The results are stronger for small-cap stocks. For size-quintile 1, the coefficient estimate of the *Age* variable is 0.052 ($t$-stat = 2.84) and the coefficient estimate of the *Income* variable is −0.801 ($t$-stat = − 2.40). The relative strength of the small-cap results is consistent with the findings in Kumar and Lee (2006), who show that retail investor sentiment has incremental explanatory power to explain the comovements in small stock returns, and also with Gompers and Metrick (2001), who argue that institutions focus their investments on large-cap stocks.

To examine the economic significance of the results, we measure the shift in the average ex-day premium corresponding to a one-standard deviation change in the age and income variables. For the small-cap stock category, a one-standard deviation change in *Age* corresponds to a 0.067 shift ($12.82 \times 0.052/10 = 0.067$) in the ex-day premium, while a one-standard deviation change in *Income* corresponds to a $-0.052$ shift ($64.55 \times -0.801/1000 = -0.052$). These numbers indicate that the potential impact of age- and tax-induced retail dividend clienteles on ex-day stock returns is economically important. Overall, these results (especially for small-cap stocks) are consistent with the assumption of many ex-day papers that retail investor characteristics (particularly tax rates) are impounded into ex-day stock prices.

### *C. Dividend Announcements and the Attention Hypothesis*

In Section III.A we find evidence consistent with old and low-income investors pursuing dividends on the cum-day and earlier. In this section, we investigate whether dividend-loving investors might purchase stocks in response to a behavioral hypothesis, namely, when a news event draws their attention to dividend paying stocks. There is no tax or consumption justification for buying a stock on the announcement day (e.g., versus buying on the cum-day); however, Lee (1992), Barber and Odean (2001), and Chan (2003) argue that investor stock purchases increase when information events draw investor attention to a particular stock. These authors investigate information events in general. We focus on dividend announcement information events and also examine whether the attention hypothesis varies by investor characteristic. We conjecture that investors who are attracted to dividend paying stocks are those most likely to be net buyers following a dividend announcement.

Table V presents the average EBSI of different groups of investors around announcement events.[32] Panel A reports EBSI for all announcements, while Panel B reports EBSI for high-yield stocks. We find that retail investors as a group exhibit net buying on the announcement date, as well as during the post-event week. However, relative to ex-dividend dates, the directional volume reaction following announcements is weak.

Examining the volume reaction across investor groups, as conjectured, we find that the post-announcement week EBSI is positive and strong for both older and low-income investor groups. Furthermore, the post-announcement week EBSI is considerably stronger for high DY stocks: For the older and low-income investors, the post-announcement week EBSIs are 13.06 and 5.76, respectively. The EBSI differentials between the announcement day and pre-event week, and between the post-announcement week and pre-announcement week, are

[32] Our announcement-date results are based on 234,688 trades (125,307 buys, 109,381 sells) executed in a 10-day window around the announcements. Out of 54,457 announcement events, investors in our sample trade around 20,451 events (37.55%) for which they execute an average of 11.48 trades per event. Like our ex-day analysis, the BSI is only computed for days in which we have at least five investor trades.

**Table V**

## Trading Activity around Dividend Announcements

This table reports the average excess buy–sell imbalance (BSI) around dividend announcement dates. Investor groups are formed by sorting on age and income. The BSI is computed as the ratio of the net buy imbalance (Buy Volume − Sell Volume) and total volume (Buy Volume + Sell Volume) on a given day. The excess BSI is obtained by subtracting the expected level of BSI, where expected BSI is the average of BSI levels on days $t-20$ to $t-16$ and days $t+16$ to $t+20$. The announcement date is $t=0$. Equal-weighted averages (average across all events) of excess BSIs are reported for the event date and for four time periods around the announcement date. In Panel A, we report the results for all dividend paying stocks in our sample. In Panel B, we report the results for high dividend yield (top quintile) stocks. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996. * and ** denote significance at the 5% and 1% levels, respectively.

| Investor Group | Pre-event −10:−6 | Pre-event −5:−1 | Event Day 0 | Post-event +1:+5 | Post-event +6:+10 | Ev − Pre | Post − Pre |
|---|---|---|---|---|---|---|---|
| Panel A: Announcement-Day Activity for All Dividend Paying Stocks | | | | | | | |
| All investors | −0.97 | −0.76 | 1.05 | 2.90 | 0.92 | 1.80* | 3.65** |
| Age groups | | | | | | | |
| Below 45 (Younger) | −2.11 | 0.50 | 0.23 | 0.68 | −0.66 | −0.27 | 0.18 |
| 45–65 | −0.97 | −1.73 | 1.13 | 1.24 | −0.73 | 2.85** | 2.96** |
| Above 65 (Older) | −0.51 | 1.23 | 2.20 | 6.34 | 1.42 | 0.97 | 5.11** |
| Older − Younger | 1.60 | 0.73 | 1.97* | 5.67** | 2.08* | 1.24 | 4.93** |
| Income groups | | | | | | | |
| Below 40K (Low) | −0.45 | 0.36 | 1.22 | 3.70 | 0.89 | 0.87 | 3.34** |
| 40–75K | −1.94 | 0.89 | 1.05 | 2.99 | −1.21 | 0.17 | 2.10** |
| Above 75K (High) | −0.81 | −2.06 | −1.45 | −0.99 | 1.15 | 0.61 | 1.07 |
| Low − High | 0.36 | 2.42** | 2.68** | 4.69** | −0.25 | 0.26 | 2.27** |
| Panel B: Announcement-Day Activity for High Dividend Yield (Top Quintile) Stocks | | | | | | | |
| All investors | 1.68 | −1.79 | 2.03 | 4.06 | 3.64 | 3.82** | 5.85** |
| Age groups | | | | | | | |
| Below 45 (Younger) | 1.96 | 0.62 | 1.85 | −0.93 | 0.07 | 1.24 | −1.54 |
| 45–65 | −0.60 | −5.54 | −4.57 | 0.68 | −2.33 | 0.97 | 6.21** |
| Above 65 (Older) | 1.39 | 1.71 | 9.64 | 13.06 | 10.37 | 7.93** | 11.35** |
| Older − Younger | 0.57 | 1.09 | 7.79** | 13.99** | 10.30** | 6.69** | 12.89** |
| Income groups | | | | | | | |
| Below 40K (Low) | 2.42 | 2.44 | 5.29 | 5.76 | 7.48 | 2.84** | 3.32** |
| 40–75K | 1.37 | −2.15 | −0.10 | 3.87 | 0.44 | 2.06* | 6.02** |
| Above 75K (High) | 2.10 | −1.91 | −4.58 | −1.81 | 1.04 | −2.67** | 0.10 |
| Low − High | 0.32 | 4.36** | 9.87** | 7.57** | 6.45** | 5.52** | 3.22** |

positive for low-income (2.84 and 3.32, respectively) and older (7.93 and 11.35) investors. Overall, the post-announcement EBSI for the older group is stronger than that for low-income investors.

Consistent with the attention hypothesis, we identify net buying following dividend announcements. This attention-driven activity is most pronounced among investors with the strongest dividend preferences. To the best of our knowledge, this is the first evidence of attention-drive trading that finds heightened activity among subgroups of investors with characteristics that make them sensitive to attention-driven effects.

### D. Does Trading around Dividend Events Explain Portfolio Holdings?

Is the accelerated trading around ex-days and announcement days substantial enough to help explain the holdings of retail investors? To examine the relation between dividend event trading activities and retail investors' end-of-month portfolio positions, we measure total trading volume during $k$ days ($k = 1, 3, 5, 10$) around dividend events. We normalize by the aggregate retail position for each stock at the end of the previous month. The ratio of the event-period trading volume and the previous month's portfolio position (in short, the volume-position ratio or VPR) provides a measure of the significance of dividend-event-window trading activities of retail investors.

Around ex-days, we find that for $k = 10$, the mean VPR is 17.11% (median = 3.25%) when we consider all events and 37.92% (median = 11.40%) when we only consider cases in which event-window trading volume is positive. Therefore, median trading around a typical year's four ex-dividend dates would explain about 13% of an investor's holdings ($3.25\% \times 4 = 13\%$).

The quarterly statistics are surprisingly similar around dividend announcements. Around dividend announcements, we find that for $k = 10$, the mean VPR is 17.71% (median = 3.31%) when we consider all events and 40.28% (median =11.71%) when we only consider cases in which event-window trading volume is positive. When smaller event-day windows are chosen (e.g., $k = 1$), the VPR measures are lower but the pattern is similar.

To determine whether the relative importance of ex-day trading increases after the 1993 marginal tax rate increase, we examine VPR for both the 1991 to 1992 and 1993 to 1996 subperiods. When the marginal tax rate increases, we expect VPR to increase if taxes cause the increase in ex-day trading. For $k = 10$, when we consider all events, we find that the mean ex-day VPR for the 1991 to 1992 and 1993 to 1996 subperiods are 13.49% and 18.97%, respectively (the medians are 2.29% and 4.24%, respectively). When we only consider cases for which event-window trading volume is positive, the mean ex-day VPR for 1991–92 and 1993–96 sub-periods are 26.46% and 44.29%, respectively (the medians are 10.06% and 12.30%, respectively). The increase in mean VPR is statistically significant, with $t$-values greater than 12 in both cases. Collectively, the evidence suggests that the trading activities of retail investors around ex-days are at least partially induced by tax considerations.

### E. Dividend Initiations and Omissions

Finally, we examine whether the trading activities of retail investors around dividend initiations and omissions are consistent with clientele activity. Initiations and omissions are important events that represent a significant shift in corporate policy. Given their salience, we conjecture that investors with strong dividend preferences are likely to exhibit strong volume reactions.

We define dividend initiations as cases in which a stock that had not paid dividends in the past year initiates a cash dividend. Our sample of dividend omissions consists of missed quarterly cash dividend payments. There are 494

initiations and 226 omissions during the sample period. To investigate possible clientele effects, we measure the excess monthly ownership around initiations and omissions to allow for the possibility of a delayed reaction to these events.

To measure the total ownership of an investor group in a particular stock, we construct an aggregate portfolio for each investor group. The total weight in this aggregate portfolio is used to measure a group's ownership in a stock. Corresponding to each event, we also define the benchmark ownership level as the average ownership in months $t - 7$ to $t - 2$, where $t$ is the event month. Finally, for each investor group and for each event, we compute the excess ownership in a window around the event date.

Examining the behavior of the entire group of retail investors, we find that the ownership changes are quite small following dividend initiations, and weaker

**Table VI**

**Retail Ownership Shifts around Dividend Initiations and Omissions**

This table reports total and excess group ownership around dividend initiations and omissions. Investor groups are defined based on age and income. The total ownership in a particular stock is the total weight of the stock in the aggregate group portfolio, where the aggregate portfolio is constructed by combining the portfolios of all investors within the group. Corresponding to each event, a benchmark ownership level is defined for each group, where the benchmark is the average ownership in months $t - 7$ to $t - 2$ and $t$ is the event month. The excess ownership is the difference between the observed and benchmark ownership levels. Column 1 reports the benchmark ownership, columns 2–5 report the observed ownership levels, and columns 6–8 report excess ownership levels. The retail investor data are from a large U.S. discount brokerage house for the period 1991 to 1996. * and ** denote significance at the 5% and 1% levels, respectively.

| Investor Group | Pre(2) −7:−2 | Pre(1) −1 | Ev 0 | Post(1) +1 | Post(2) +2:+7 | Ev − Pre(2) | Post(1) − Pre(2) | Post(2) − Pre(2) |
|---|---|---|---|---|---|---|---|---|
| Panel A: Dividend Initiations | | | | | | | | |
| All investors | 1.67 | 1.73 | 1.78 | 1.63 | 1.67 | 0.11* | −0.04 | −0.01 |
| Age groups | | | | | | | | |
| Below 45 (Younger) | 1.85 | 1.96 | 1.89 | 1.90 | 1.82 | 0.04 | 0.05 | −0.02 |
| 45–65 | 1.67 | 1.69 | 1.68 | 1.62 | 1.59 | 0.01 | −0.05 | −0.08 |
| Above 65 (Older) | 1.90 | 1.97 | 2.08 | 2.17 | 1.98 | 0.18** | 0.28** | 0.09* |
| Income groups | | | | | | | | |
| Below 40K (Low) | 1.70 | 1.74 | 1.84 | 1.95 | 1.70 | 0.14* | 0.25** | −0.00 |
| 40–75K | 1.89 | 1.89 | 1.98 | 1.89 | 1.76 | 0.09* | 0.01 | −0.13* |
| Above 75K (High) | 1.74 | 1.86 | 1.78 | 1.76 | 1.70 | 0.04 | 0.02 | −0.04 |
| Panel B: Dividend Omissions | | | | | | | | |
| All investors | 1.57 | 1.53 | 1.51 | 1.55 | 1.54 | −0.05 | −0.02 | −0.02 |
| Age groups | | | | | | | | |
| Below 45 (Younger) | 1.86 | 1.93 | 2.00 | 2.11 | 1.94 | 0.14** | 0.25** | 0.08 |
| 45–65 | 1.68 | 1.63 | 1.86 | 1.70 | 1.60 | 0.18** | 0.02 | −0.08 |
| Above 65 (Older) | 1.87 | 2.08 | 1.93 | 1.79 | 1.92 | 0.06 | −0.08 | 0.05 |
| Income groups | | | | | | | | |
| Below 40K (Low) | 2.15 | 1.94 | 2.05 | 1.93 | 1.83 | −0.10* | −0.22** | −0.32** |
| 40–75K | 1.48 | 1.52 | 1.49 | 1.48 | 1.51 | 0.01 | 0.00 | 0.03 |
| Above 75K (High) | 1.84 | 1.67 | 1.88 | 1.61 | 1.50 | 0.05 | −0.23** | −0.34** |

still for omissions (see Table VI). However, the ownership changes within age and income groups are consistent with the existence of age and tax clienteles. For instance, following a dividend initiation, older investors increase their ownership in a stock by an average of 0.18% in the event month and by 0.28% in the month following the event (see Panel A). Similarly, the corresponding ownership changes in the low-income investor group are 0.14% and 0.25%, respectively. However, 6 months after the event, the group ownerships are only marginally different from their pre-event levels.

In contrast to dividend initiations, dividend omissions do not have any perceptible influence on the behavior of retail investors as a group (see Panel B). Within age and income groups, we find that older investors do not exhibit an abnormal reaction but younger investors increase their ownership. We also find that low-income investors decrease their holdings by an average of 0.10% in the event month and by 0.22% in the month following the event. This is consistent with the tax-induced clientele hypothesis. However, there is also a decrease in ownership among high-income investors. Overall, trading activities around omissions provide, at best, weak evidence supporting the dividend clientele hypothesis.

## IV. Summary and Conclusion

We study the stock holdings of more than 60,000 households and find that as a class, retail investors prefer nondividend paying stocks. We also confirm recent evidence (e.g., Grinstein and Michaely (2005)) that institutions prefer to hold dividend paying stocks. We also investigate the cross-sectional relation between retail investor characteristics and dividend preferences. For holdings of dividend paying stocks, among retail investors we identify a preference for DY that increases with age (consistent with life cycle or consumption preferences) and decreases with income (consistent with low tax investors holding high-yield stocks). Institutional investors prefer low DY stocks.

We find additional evidence consistent with dividend preferences varying in a manner consistent with tax characteristics. When taxes are likely to be a major concern (e.g., for young investors), a greater proportion of high dividend stocks are held in tax-deferred accounts. In contrast, when taxes are of minimal concern (e.g., older investors), investors' dividend preferences across taxable and tax-deferred accounts are indistinguishable. Furthermore, consistent with the tax hypothesis, the 1993 marginal tax rate increases led to reduced DY in the portfolios of the subset of retail investors for whom tax rates increased.

We also investigate stock trades. First, we find evidence that older and low-income investors buy stocks on the cum-dividend day or earlier, in order to obtain the dividend. This is somewhat surprising because it indicates that older and low-income investors trade more actively in pursuit of dividends than might have been anticipated. This result could be unique to our data set of discount brokerage accounts, if these investors are more active traders than is typical. We also find that income and age characteristics appear to be impounded into ex-day returns among small-cap stocks.

Second, we find that older and low-income investors purchase stocks that recently announced dividends, consistent with a behavioral hypothesis that posits that investors purchase stocks that attract their attention (e.g., Lee (1992), Barber and Odean (2001)). To the best of our knowledge, we are the first to find that the strength of the attention reaction varies predictably with the degree to which the attention of an investor is drawn to a particular event. Third, we find that older investors purchase stocks after the stocks initiate dividends. Finally, we find that our main portfolio-based results hold when we examine the initial purchase of stocks, making it unlikely that the conclusions we draw based on holdings are spurious. Overall, our evidence is consistent with the existence of age and tax clienteles.

Finding evidence of dividend clienteles has interesting implications for corporate policies. For example, if financial executives perceive that there is a certain clientele of investors that holds their company's stock, they may hesitate to change their payout policies because they believe that such an action might result in an alteration of their investor base and lead to a reduction in the price of their company's stock. This is consistent with recent survey evidence (Brav et al. (2005)).

Finally, finding that older and low-income investors disproportionally own high dividend stocks introduces an interesting wrinkle into recent policy debates. Our results suggest that policies that reduce dividend taxation or otherwise encourage companies to pay dividends are beneficial to older, low-income investors, at least among those who own stocks. This is an interesting area for future research.

## Appendix: Dividend Preference Measures

To measure the dividend preferences of a group of investors, we combine the portfolios of all investors in the group into a group-level aggregate portfolio. The unexpected (or excess) portfolio weight in dividend-paying stocks in the group-level portfolio provides a measure of the group's dividend preference. In particular, for a given group portfolio $p$ in month $t$, we compute the percentage weights of dividend paying ($w_{pt}^{div}$) and nondividend paying ($w_{pt}^{ndiv}$) stocks in the group portfolio. In month $t$, any stock that makes a dividend payment in the previous year is classified as a dividend-paying stock. We also compute the portfolio weights (in percent) in dividend ($w_{mt}^{div}$) and nondividend ($w_{mt}^{n\,div}$) paying stocks in the aggregate market portfolio. We interpret the weight of dividend paying stocks in the market portfolio as a measure of the expected weight in dividend paying stocks if investors were to randomly select stocks. The excess percent weight in dividend paying stocks ($EWD$) in portfolio $p$ in month $t$,

$$EWD_{pt} = w_{pt}^{div} - w_{mt}^{div}, \tag{A1}$$

provides a measure of the dividend preference of the group of investors. By computing the time-series average of $EWD$, we obtain the dividend preference reflected in group-level portfolio $p$ during a given time period (1, $T$)

$$EWD_p = \frac{1}{T}\sum_{t=1}^{T} EWD_{pt}. \tag{A2}$$

The excess percent weight in nondividend paying stocks (EWND) is defined analogously.

To examine the dividend preference of an investor, we measure the DY of the investor portfolio. The DY of the portfolio of investor $i$ at the end of month $t$, $PDY_{it}$, is defined as

$$PDY_{it} = \sum_{j=1}^{N_{it}} w_{ijt} DY_{ijt}. \tag{A3}$$

Here, $N_{it}$ is the number of stocks in the portfolio of investor $i$ at the end of month $t$, $w_{ijt}$ is the weight of stock $j$ in investor $i$'s portfolio at the end of month $t$, and $DY_{ijt}$ is the quarterly DY of stock $j$ in investor $i$'s portfolio from the most recent quarter prior to month $t$. The quarterly DY of stock $j$ at the end of quarter $q$ is the ratio of its quarterly dividend payment ($D_{jq}$) to its cum-dividend price, that is, the closing price of the stock on the day before the ex-date ($P_{jq}^{\text{cum}}$), $\text{DY}_{jq} = D_{jq}/P_{jq}^{\text{cum}}$. Taking an average of $PDY$ over time, we obtain the average $PDY$ for investor $i$, during a given time period (1, $T$):

$$PDY_i = \frac{1}{T}\sum_{t=1}^{T} PDY_{it}. \tag{A4}$$

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