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

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Abstract

We study the stock holdings and trading behavior of a representative group of more than 60,000 households and find evidence consistent with dividend clienteles. The stock holdings of retail investors indicate a preference for dividend yield that increases with age (consistent with life-cycle or consumption preferences) and decreases with income (consistent with low-tax investors holding high-yield stocks) and risk aversion. The stock trading behavior of retail investors provide reinforcing evidence of these dividend preferences. Older, low-income investors disproportionally purchase stocks before the ex-dividend day. Among small stocks, the ex-day premium increases with age and decreases with income, which is consistent with tax explanations of the ex-day premium. We also find evidence that older, low-income investors purchase stocks after they initiate dividends. Finally, we document that, consistent with the attention hypothesis, older and low-income investors purchase stocks on and after dividend announcement dates. These results have important policy implications because they indicate that recent reductions in the dividend tax rate are not exclusively a "tax break for the rich" because, in fact, the income streams of older and less wealthy investors benefit more from the proposed policy changes.

Do individual (or retail) investors prefer dividends? If so, what are the main determinants of their dividend preference? According to the traditional view (Miller and Modigliani 1961, Elton and Gruber 1970), the difference in the dividend and capital gains tax rates influences the dividend preference of investors. If there exists a positive differential between the tax rates on dividends and capital gains, firms that pay higher dividends are likely to attract groups of investors that have lower marginal tax rates. Low (high) income retail investors face a negative (positive) dividend-capital gains tax rate differential. Hence, low (high) income investors are likely to favor high (low) dividend yield stocks and consequently, a tax-induced retail investor dividend clientele may emerge.

Some retail investors may exhibit a strong preference for dividend paying stocks in spite of a tax disadvantage. For instance, investors with a high degree of risk aversion may prefer a stream of relatively certain dividend payments over uncertain capital gains. Alternatively, mental accounting (Thaler 1985) may influence investors' dividend preference – investors who keep dividend income and capital gains in two separate mental accounts may not treat them equally. Such investors may prefer high dividend yield (DY) stocks because the dividend income may act as a "silver-lining" when the capital gains are low or negative.

Life-cycle considerations may influence retail investors' dividend preference too (Shefrin and Thaler 1988). Older investors or any investor with a greater need for a regular income stream may prefer high DY stocks if they use the dividend income to finance their consumption. Due to self-control reasons, these investors may prefer cash dividends over "home grown" dividends (i.e., income generated by the partial liquidation of the portfolio or by holding relatively less risky bonds). Furthermore, to avoid regret, they may adopt the heuristic "consume from dividend and keep the principal intact" (Shefrin and Statman 1984).

Taken together, mental accounting, regret and self-control based theories predict that dividend income and capital gains need not be perfect substitutes and consumption from dividends may be preferred over consumption from capital gains. In fact, Long (1978) provides evidence that suggests that the market is willing to pay a premium for cash dividends.

In addition to a "rational," tax-induced clientele and a "behavioral," age-based clientele, other factors such as differential risk perceptions of investors and transaction costs may lead to the formation of dividend clienteles. Investors may prefer to hold high DY stocks due to their risk characteristics – high DY stocks are typically less risky than low DY stocks.

To summarize, there are several strong and theoretically sound reasons for the existence of retail investor dividend clienteles. There is also a widespread belief that retail investors

prefer dividend income over capital gains and anecdotal as well as indirect evidence on the existence of dividend clienteles from a variety of settings support such a belief (e.g., Elton and Gruber (1970), Eades, Hess, and Kim (1984), Green and Rydqvist (1999)). The extant evidence suggests that the dividend preference of retail investors is likely to be an important determinant of firms' payout policies. Brav, Graham, Harvey, and Michaely (2003) survey a large number of CFOs, Treasurers and other managers to identify the main determinants of firms' payout policies. There is a strong belief among these financial executives that retail investors' prefer dividend paying stocks.[1] Furthermore, several studies, either implicitly or explicitly, assume the existence of a tax-based retail investor dividend clientele. However, so far, direct evidence on the dividend preference of retail investors is scarce.

In this paper, using the investment accounts of more than 60,000 retail investors at a large discount brokerage house in the U.S. during the 1991-96 time-period, we provide direct evidence on the existence of retail investor dividend clienteles. We find that, as a group, retail investors prefer non-dividend paying stocks over dividend paying stocks. However, within the retail investor group, older and low-income investors prefer dividend paying stocks over non-dividend paying stocks. Within the set of dividend paying stocks, as a group, retail investors prefer high DY stocks over low DY stocks. Furthermore, older and low-income investors have a stronger preference for high DY stocks. Using the level of diversification as a proxy for investors' risk aversion, we find that the dividend preferences of retail investors are also influenced by risk aversion.

Overall, these results provide evidence of age, tax and risk-induced retail investor dividend clienteles, with the age clientele appearing to be the strongest. Our direct evidence on the existence of tax clienteles reinforce the findings from previous studies that have provided indirect support for the existence of tax clienteles (e.g., Elton and Gruber (1970), Eades, Hess, and Kim (1984), Barclay (1987), Green and Rydqvist (1999), Graham, Michaely, and Roberts (2003)).

We also find that the trading behavior of retail investors around dividend events (ex-dividend days, dividend announcement dates, dividend initiations, and dividend omissions) are consistent with the observed clientele effects. 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. These investor groups also exhibit abnormal buying behavior following dividend announcements and increase their holdings following dividend initiations.

The dividend preferences of retail investors has economically significant influence on the

[1] Approximately half of the respondents cited the strong dividend preference of retail investors as an important determinant of their payout policies.

ex-day return. We find that personal investor characteristics (age and income) that are the primary determinants of investors' dividend preferences get impounded into asset prices and help explain the variation in the ex-day premium. Furthermore, the explanatory power of age and income variables is stronger among small-cap stocks where retail investors are more likely to be the marginal investors. Overall, our results support the view that the ex-day price drop is jointly influenced by investors' age and marginal tax rates, as proxied by income.

This research has important policy implications. Recently, the taxation of dividends has been reduced dramatically, from rates as high as 39.6% to rates as low as 15% for the richest investors and even lower for the less wealthy. The reduced dividend taxation has received wide criticism as being a "tax break for the rich." The results from our paper suggest that this conclusion may be overstated. Given the strong dividend preference of older and low-income investor groups, the benefits of Bush's proposed policy may be more widespread than currently believed. While it is true that the wealthy own more stocks than the poor (Allen and Michaely 2003), our results indicate that the stock holdings of the old and the less wealthy are skewed more towards dividends than are the holdings of the wealthy. Therefore, our evidence suggests that, relative to their wealthy counterparts, the income stream of older and less wealthy investors benefits more from the recent reduction in dividend taxation.

The rest of the paper is organized as follows: in the following section, we provide a brief overview of the literature on retail investor dividend clienteles. A brief description of the datasets used in the study is provided in Section II. In Section III, we provide empirical evidence on the existence of retail investor dividend clienteles. In Section IV, we examine the trading activities of retail investors around dividend events and provide more evidence of dividend clienteles. We carry out robustness tests in Section V and, finally, we conclude in Section VI with a brief summary of the paper and implications of our findings.

I Background: Dividend Clienteles

According to the dividend clientele hypothesis (Miller and Modigliani 1961), firms attract investor clienteles based on their dividend payout policy. Firms that pay lower (higher) dividend attract investors in the higher (lower) marginal tax brackets and this creates an optimal match between the dividend policy of a firm and the dividend preferences of its stockholders. For instance, tax-exempt institutional investors such as pension funds and college endowment funds and retail investors with lower marginal tax rates are likely to prefer high dividend yield (DY) stocks. All else equal, if there exists a positive differential

between the tax rates on dividends and capital gains, higher dividends are likely to attract groups of investors that have lower marginal tax rates.

Several studies provide indirect evidence of a tax-induced dividend clientele by examining the price and volume reactions around dividend events. For instance, Elton and Gruber (1970) find that the implied marginal tax rates (as reflected in the ex-day premium) are higher (lower) for low (high) dividend yield stocks. Bajaj and Vijh (1990) and Denis, Denis, and Sarin (1994) show that price reactions to dividend changes are stronger for high dividend yield stocks, perhaps because high yield stocks attract investors with preference for dividends. This evidence is consistent with the clientele hypothesis. Numerous studies (e.g., Michaely, Thaler, and Womack (1995), Seida (2001)) have examined volume reactions around dividend events (dividend changes, initiations, and omissions), providing mixed evidence about whether clienteles exist.

Previous studies have also provided direct evidence on the dividend preferences of institutional investors. For instance, Grinstein and Michaely (2002) find that institutions prefer dividend-paying firms over non-dividend-paying firms and they prefer firms that repurchase shares. However, institutions do not exhibit a strong preference for high yield stocks. Dividend initiations lead to a higher institutional ownership (Dhaliwal, Erickson, and Trezevant 1999, Binay 2001) while dividend omissions result in lower institutional ownership (Binay 2001). Overall, these results suggest that institutional dividend clienteles may exist.

In contrast to our rich understanding of institutional dividend preferences, relatively less is known about the dividend preferences of retail investors. Direct evidence on the existence of retail investor dividend clienteles has been mixed. Blume, Crockett, and Friend (1974) document an inverse relation between income (a proxy for marginal tax rates) and portfolio dividend yield. In another instance, using data on the stock holdings of individual investors from a retail brokerage house, Pettit (1977) provides evidence of a tax-induced dividend clientele – investors in high tax brackets have a stronger preference for low DY stocks. However, using the same dataset as Pettit (1977) but a different methodology, Lewellen, Stanley, Lease, and Schlarbaum (1978) find only a very weak evidence of a tax-induced retail investor dividend clientele.

Scholz (1992) uses data from the 1983 *Survey of Consumer Finances* to test the dividend clientele hypothesis. He finds that tax rates influence the dividend yield of investor portfolios after controlling for transaction costs and risk. Our results are broadly consistent with the findings of Scholz (1992) and reinforce the evidence of a tax-based dividend clientele. In addition, we extend his results along multiple dimensions.

We provide evidence of age and risk clienteles and estimate the relative strengths of these clientele effects. Perhaps more importantly, we examine the actual stock holdings and trades of retail investors to determine whether dividend clienteles exist, while Scholz (1992) studies survey-declared year-end aggregate investor portfolios. The frequency of our data allows us to examine trades in individual stocks around dividend events (ex-dividend days, dividend announcement dates, dividend initiations, and dividend omissions), which is not possible using SCF's annual data. Investors' trades around dividend events provide strong and robust evidence of dividend clienteles.

With detailed stock-level dividend data instead of only an aggregate portfolio dividend yield, we are also able to examine investors' preferences for dividend yields. In addition, the stock-level data allows us to examine the relation between investors' personal characteristics and stock returns. Finally, with detailed information about the composition of investor portfolios we are able to develop direct measures of portfolio risk instead of using survey-declared proxies to control for risk.

II Data and Sample Selection

The primary data for this study consist of trades and monthly portfolio positions of retail investors at a major discount brokerage house in the U.S. for the period of 1991-96. There are a total of 77,995 households in the database of which 62,387 trade in stocks. An average investor holds a 4-stock portfolio (median is 3) 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) and the average number of days an investor holds a stock is 187 trading days (median is 95). In any given month, approximately 80% of investors own at least one dividend paying stock.

For a subset of households (31,260 households), demographic information such as age, income, occupation, marital status, gender, etc. is also available. In this study, we primarily examine the portfolio decisions and trading behavior of retail investor groups defined on the basis of age and income. In particular, we focus on the behavior of older and low-income investors. Table I (Panel A) reports the distribution of investors across age and income groups. Approximately 15% of investors are 65 years or older while 17% of them have low-income (annual household income $< 40{,}000$).

The portfolio and trading characteristics of these investor groups are considerably different (see Table I, Panel B), though these differences are not entirely unexpected. Older

investors, on average, hold a $55,685 portfolio with 6 stocks. In contrast, younger investors, on average, hold a much smaller portfolio worth $24,402 with only 4 stocks. Older investors also trade less frequently – the average annual portfolio turnover for this group is 4.46% while younger investors' average portfolio turnover is 5.36%. Examining the portfolio characteristics of the income groups we find that low-income investors hold slightly smaller portfolios and they trade more frequently relative to high income investors. Other portfolio characteristics such as risk-adjusted performance (as measured by Sharpe ratio) and proportion of portfolio allocated to mutual funds are remarkably similar across the age and income groups.[2]

To gauge how representative our retail investor sample is of the overall population of retail investors in the U.S., we compare the stock holdings of the investors in our sample with those reported by the Census Bureau[3] (Survey of Income and Program Participation (SIPP), 1995) and the Federal Reserve[4] (Survey of Consumer Finances (SCF), 1992, 1995). According to the 1992 SCF, a typical household held $8,700 in stocks (median was $16,900). The stock ownership declined marginally in the 1995 SCF where a typical household held $8,000 in stocks (median was $15,300). In the SIPP survey conducted by the Census Bureau, the real median value of stock and mutual funds held by households increased from $7,331 in 1993 to $9,000 in 1995. The median portfolio size of an investor in our sample is $13,869 and it matches quite well with the average portfolio sizes reported in SCF 1992, SCF 1995, and SIPP 1995.[5] Overall, these comparisons suggest that our retail investor sample is likely to be a good representative of the households in the U.S.

In addition to the retail investor dataset, we obtain quarterly institutional ownership data from Thomson Financial (formerly known as CDA Spectrum). The data contains the end of quarter stock holdings of all institutions that file form 13F with the Securities and Exchange Commission (SEC). Institutions with more than $100 million under management are required to file form 13F with the SEC and common stock positions of more than 10,000 shares or more than $200,000 in value must be reported on the form. 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 1991-96 sample period, we obtain the quarterly cash dividend payments, monthly stock prices, monthly shares outstanding, and

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

[3]*Source:* US Census Bureau Report, Asset Ownership of Households, 1995. The data are available at `http://www.census.gov/hhes/www/wealth/1995/wealth95.html`.

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

[5]In unreported results, we find that the portfolio sizes are comparable when we examine the portfolio sizes of investors in different age and income groups.

monthly stock returns from CRSP. A total of 3,418 stocks paid dividends during the 1991-96 time-period. From this set, 2,775 stocks are present in our sample and they distributed 54,457 cash dividend payments during the 1991-96 sample period.

III Dividend Preference of Retail Investors: Existence of Dividend Clienteles

III.A Dividend Preference Measures

Our first measure of investors' dividend preference is the unexpected (or excess) portfolio weight in dividend paying stocks. For a given portfolio p and month t, we compute the weights of dividend paying (w_{pt}^{div}) and non-dividend paying (w_{pt}^{ndiv}) stocks in the portfolio. In month t, any stock that makes a dividend payment in the previous one year is classified as a dividend paying stock. We also compute the portfolio weights in dividend (w_{mt}^{div}) and non-dividend (w_{mt}^{ndiv}) paying stocks in the aggregate market portfolio. The excess weight in dividend paying stocks (EWD) in portfolio p in month t,

$$\text{EWD}_{pt} = w_{pt}^{\text{div}} - w_{mt}^{\text{div}}, \tag{1}$$

provides a measure of the dividend preference of an investor (or a group of investors). When measuring the dividend preference of a group of investors, the individual portfolios are combined into an aggregate portfolio for the group and its EWD is computed. By computing a time-series average of EWD, we obtain the dividend preference reflected in portfolio p during a given time-period $(1, T)$:

$$\text{EWD}_{p} = \frac{1}{T}\sum_{t=1}^{T} \text{EWD}_{pt}. \tag{2}$$

Our second measure of dividend preference is the portfolio dividend yield (PDY). The PDY of investor portfolio p at the end of month t, PDY_{pt}, is measured using:

$$\text{PDY}_{pt} = \sum_{j=1}^{N_{pt}} w_{pjt}\text{DY}_{pjt}. \tag{3}$$

Here, N_{pt} is the number of stocks in portfolio p at the end of month t, w_{pjt} is the weight of stock j in the portfolio at the end of month t, and DY_{pjt} is the quarterly dividend yield of stock j in the portfolio from the most recent quarter prior to month t. The quarterly dividend yield of stock j at the end of quarter q is the ratio of its quarterly dividend payment (D_{jq}) to its cum-dividend price (P_{jq}^{cum}), $\text{DY}_{jq} = D_{jq}/P_{jq}^{\text{cum}}$. Again, taking an average of PDY over

time, we obtain the average portfolio dividend yield during a given time-period $(1, T)$:

$$\text{PDY}_p = \frac{1}{T}\sum_{t=1}^{T} \text{PDY}_{pt}. \tag{4}$$

To measure the dividend preference of a group of investors, we compute the cross-sectional average of PDY, either at a given time (t) or during a given time-period $(1, T)$.

Finally, to measure the preference of an investor group (e.g., retail investors) for a set of stocks (e.g., high dividend yield stocks), we use the average ownership of the investor group in the chosen set of stocks, where the group ownership for a given stock is the ratio of the total number of shares held by the group to the total number of shares outstanding.

III.B Aggregate Level Dividend Preference of Retail Investors

We examine whether our sample of retail investors as a group are attracted towards dividend paying stocks.[6] We measure the average aggregate ownership of retail investors in our sample in dividend paying (DIV) and non-dividend paying (NDIV) stock categories. For comparison, we also measure the average institutional ownership in DIV and NDIV categories.

The results are presented in Table II (Panel A). In each of the six years in our sample period, the average aggregate ownership of retail investors in our sample in dividend paying stocks is lower than their average ownership in non-dividend paying stocks. For instance, in 1991, the average ownership of retail investors in our sample in DIV and NDIV categories are 0.071% and 0.165%, respectively. In contrast, the aggregate institutional ownership in these two categories are 27.85% and 13.43%, respectively.[7] This evidence suggests that, as a group, retail investors prefer non-dividend paying stocks while institutional investors prefer dividend paying stocks. The evidence on institutional dividend preference is consistent with the results in Grinstein and Michaely (2002).

Similar results are obtained when we use another measure of retail dividend preference. First, we combine the portfolios of all retail investors in our sample and obtain an aggregate retail portfolio. Then, each month we measure the portfolio weights in DIV and NDIV stock categories (w_t^{div} and w_t^{ndiv}) and obtain annual measures by averaging the monthly portfolio weights. The expected portfolio weight in DIV and NDIV categories are computed using

[6] Throughout the paper we use the term "retail investors" to refer to the group of retail investors in our sample and not the entire population of retail investors in the market. Our assumption is that retail investors in our sample is a representative of the retail investor population. See the discussion in Section II.

[7] The aggregate institutional ownership represents the shares owned only by institutions in the CDA Spectrum dataset. Since this dataset does not include institutional investors who hold less than 10,000 shares or under $200,000 in dollar value, this measure is downward biased.

the relative market-capitalizations of the two categories. As seen in Panel B of Table II, the observed portfolio weight in DIV category is lower by 5-8% than the expected category weight in each of the six years. The evidence of retail preference for non-dividend paying stocks appears to be robust.

As an additional robustness check, we examine if the retail preference for dividend paying stocks varies across firm size. We form size quintile portfolios at the end of each year using the market-capitalization at the end of December and compute the average retail ownership in DIV and NDIV categories for each size quintile portfolio. The results are reported in Panel C. We find that the results are virtually unchanged from our aggregate level results (see Panel A) where we consider all stocks. In each size quintile portfolio and in each year, retail investors as a group prefer non-dividend paying stocks over dividend paying stocks. The aggregate retail ownership in non-dividend paying stocks is almost twice their ownership in dividend paying stocks. Overall, these results suggest that, as a group, retail investors prefer non-dividend paying stocks.

Given the retail preference for non-dividend paying stocks, within the category of dividend-paying stocks, do retail investors also prefer low dividend yield (DY) stocks? To examine the preference of retail investors for dividend yields, first we form DY quintiles at the beginning of each year using the total dividend payments in the previous year. The stock prices at the end of December are used to compute the dividend yields. Each month, we measure the normalized portfolio weight in the DY quintile portfolios where the portfolio weight in dividend paying stocks, w_t^{div}, is used as the normalizing variable.[8] The annual averages of these normalized portfolio weights are reported in Table III (Panel A). Each year, we also obtain the expected normalized portfolio weights in the five DY quintiles using the relative capitalizations of DY quintile portfolios in the market portfolio (see Panel B). Finally, we compute the excess normalized weights in the aggregate retail investor portfolio as the difference between the actual and the expected normalized portfolio weights.

The results are reported in Panel C of Table III. Retail investors appear to exhibit a preference for both low (bottom DY quintile) and high (top DY quintile) DY stocks. The excess normalized weight is significantly positive for both top and bottom DY quintiles. Judging by the magnitude of these excess normalized weights, it appears that the retail preference for high DY stocks is stronger than the retail preference for low DY stocks. This preference structure is evident in each of the six years in our sample.

[8] At the end of month t, if the aggregate portfolio weights in DY quintile portfolios are $w_{1t}, w_{2t}, w_{3t}, w_{4t}$, and w_{5t}, where $w_{1t} + w_{2t} + w_{3t} + w_{4t} + w_{5t} = w_t^{\text{div}}$, then we obtain the normalized portfolio weights as $w_{it}^{\text{norm}} = \frac{w_{it}}{w_t^{\text{div}}} \times 100, i = 1, \ldots, 5$.

III.C Heterogeneity in Dividend Preference

A preference for both low and high DY stocks suggests that there is heterogeneity in the dividend preference of retail investors. Some investors within the retail group may prefer low DY stocks while others may have a strong preference for high DY stocks. In other words, dividend clienteles may exist among the class of retail investors. As discussed earlier, dividend clienteles can emerge from tax rate heterogeneity (Miller and Modigliani 1961, Elton and Gruber 1970) or from differences in the consumption desires of retail investors (Shefrin and Statman 1984, Shefrin and Thaler 1988).

III.C.1 Cross-Sectional Variation in Preference for Dividend and Non-dividend Paying Stocks

We begin with a series of non-parametric tests to examine the cross-sectional variation in the dividend preference of retail investors. First, we define investor groups based on age, income, and occupation. We assume that annual household income is a proxy for investors' marginal tax rate, and the age of the head of household is a proxy for the investor's consumption preferences. Nine not mutually exclusive investor groups are formed, three groups each on the basis of age, income, and occupation variables. The groups formed by sorting on the age variable are: (i) age below 45 (younger), (ii) age between 45 and 65, and (iii) age above 65 (older); the three income groups are: (i) annual household income below 40K (low income), (ii) annual household income between 40-75K, and (iii) annual household income above 75K (high income); the three occupation categories are: (i) professional, (ii) non-professional, and (iii) retired. We interpret low (high) income as measuring low (high) tax rates.

Next, the portfolios of all investors within a given group (e.g., older investors) are combined into group level portfolios. Finally, the portfolio weights in DIV and NDIV categories and normalized weights in DY quintiles are used to examine the dividend preference of these demographic groups. For each investor group, we examine their overall dividend preferences (i.e., their preference for dividend paying stocks relative to non-dividend 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).

Table IV reports the actual portfolio weights in dividend paying stocks for the nine retail investor groups. To allow for a direct comparison, the portfolio weight of the aggregate retail portfolio in the DIV category is also reported. Our results indicate that relative to younger investors, older investors allocate a greater proportion of their equity portfolio to dividend paying stocks. In fact, for older investors, the portfolio weight in the DIV category

is marginally greater than the expected portfolio weight in the DIV category. This suggests that relative to younger investors, older investors have a greater preference for 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 but only significantly so in 1991 and 1992. However, both groups have smaller weights in the DIV category relative to the market portfolio. The portfolio weights in the three occupation categories show a little more variation. Investors in the professional category have higher average income than the investors in the non-professional category and hence they exhibit a greater preference for non-dividend paying stocks. Similarly, the retired group with a higher average age exhibit a stronger preference for the DIV category, which is consistent with the age group preferences.

To examine the relative roles of age and income in explaining the dividend preferences of retail investors, we perform an independent, double sort on these two variables and form nine investor groups. For each of these investor groups, we compute the proportion of the group's aggregate portfolio invested in dividend paying stocks. These results are presented in Table V. We find that within the older investor group, investors in all three income groups exhibit a greater preference for dividend paying stocks. The difference between the portfolio weights in the DIV category for low-income, older investors and high-income, older investors is insignificant in 4 out of 6 years. This suggests that older investors prefer dividend paying stocks over non-dividend paying stocks irrespective of their income. Within the younger investor group, however, low income investors exhibit marginally stronger preference for dividend paying stocks relative to high income investors. This suggests that the income variable can explain retail investors' dividend preferences, at least to some degree, once age effects are controlled.

III.C.2 Cross-Sectional Variation in Preference for Dividend Yield

Is age also a stronger determinant (relative to income) of retail investors' preference for dividend yields? To examine the relation between age and portfolio dividend yield, we compute the normalized weights in DY quintiles for age, income, and occupation, where the investor groups are formed in the manner described above.

The results are reported in Table VI. We find that older investors assign a greater proportion of their portfolio to high DY stocks – the difference between the normalized weight in high and low DY stock categories is 14.93. Similarly, investors in the low income group

assign a greater weight to high DY stocks – the difference between the normalized weight in high and low DY stock categories is 9.79. Interestingly, within the age and income groups, the preference differential for dividend yield is monotonic – the differential between the normalized weights of older and younger, and low-income and high-income groups increases along the DY quintiles. Comparing the normalized weights of younger and older investors for a particular DY quintile, we find that in DY quintiles 1 and 2, younger investors assign a greater weight while in DY quintile 5, older investors assign a greater weight. A similar pattern is observed between the groups of low-income and high-income investors. Like before, the results for the occupation groups provides a robustness check and reinforce our findings for the age and income groups.

To examine the relative roles of age and income in explaining retail investors' preference for dividend yields, like before, we perform an independent, double sort on age and income and define nine investor groups. The normalized portfolio weights of investor groups (see Table VII) indicate that age is the dominant determinant of investors' preference for dividend levels. For older investors, the normalized portfolio weight in the high DY quintile is greater than the normalized portfolio weight in the low DY quintile irrespective of the income level, though the weight differential is higher for low income category. Furthermore, within both high and low income groups, the normalized portfolio weight of older investors in the high DY quintile is higher (by 5.45% and 13.16% respectively) than the younger investors.

Taken together, these 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 over non-dividend paying stocks, and within the set of dividend paying stocks, they exhibit the strongest preference for high DY stocks. These results are consistent with the existence of dividend clienteles, where heterogeneity in investors' income levels (marginal tax rates), consumption desires and risk preferences lead to the formation of dividend clienteles.

To quantify the dividend preferences of retail investors more accurately, we compute the quarterly portfolio dividend yield of each household portfolio at the end of each month. The yield (PDY) variable captures an investor's preference for dividend paying stocks over non-dividend paying stocks and her preference for dividend yields. Figure 1 plots the monthly PDY time-series of the three age groups (below 45, 45-65, and above 65) while Figure 2 shows this time-series for the three income groups (below 40K, 40-75K, and above 75K). The annual average PDY for these investor groups are also reported in Table VIII. The time-series plots indicate that the PDY of older (high income) investors is greater than the younger (low

income) investors, and the relative ranking is maintained throughout the six-year sample period. The PDY differentials are statistically significant in each of the six years (see Table VIII). Furthermore, in unreported results, we find that an almost monotonic relation exists between age and PDY and income and PDY when finer age and income groups are defined.[9]

III.D Dividend Preference in Taxable and Tax-Deferred Accounts: A Comparison

A considerable number of investors in our sample hold retirement accounts.[10] Investors may hold high dividend yield stocks in these tax-deferred accounts to maximize their after-tax returns. However, the tax-deferred accounts may not be attractive to low-income investors for whom the dividend-capital gains tax differential is negative. They do not get additional tax benefits by holding high dividend yield stocks in tax-deferred accounts. Furthermore, if consumption needs drive the dividend preference of older investors, they are likely to hold high yield stocks in their taxable accounts in spite of a tax disadvantage.

We divide low-income investors into two groups: (i) those who hold only taxable accounts, and (ii) those who hold only tax-deferred accounts. We carry out a similar partition of older investors. The monthly time-series of the average quarterly portfolio dividend yield for each of these four groups of investors are shown in Figure 3.

Consistent with the evidence in Barber and Odean (2003), at the aggregate level, we find that the average annual portfolio dividend yield (PDY) of investors with taxable accounts only is marginally greater (average difference = 0.08%) than investors with tax-deferred accounts. However, within the group of low-income investors, the average annual PDY is higher (average difference = 0.19%) for investors with taxable accounts than those who hold tax-deferred accounts. In contrast, within the group of high-income investors, the average annual PDY is lower (average difference = −0.24%) for investors with taxable accounts than those who hold tax-deferred accounts. This evidence suggests that tax considerations motivate low-income investors to hold higher yield stocks in taxable accounts while high-income investors use tax-deferred accounts to shelter their dividend income from taxes.

Comparing the dividend preference of investors who hold taxable accounts to those who hold tax-deferred accounts within the group of older investors, we find that the average an-

[9] We defined nine income groups based on annual household income: (i) income less than 15,000 (or 15K), income between 15K-20K, 20-30K, 30-40K, 40-50K, 50-75K, 75-100K, 100-125K, and income over 125K. The average quarterly portfolio dividend yield decreases along these income groups almost monotonically in each of the 71 months in our sample-period. A finer partition along age (ten age groups) yields qualitatively similar results – PDY increases with age in all 71 months.

[10] Approximately 42% of accounts in our sample are retirement accounts (IRA or Keogh). There are 158,031 accounts in our sample which includes 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.

nual PDY is higher (average difference = 0.64%) for investors with taxable accounts than those who hold tax-deferred accounts. In contrast, within the group of younger investors, the average annual PDY is lower (average difference = −0.35%) for investors with taxable accounts than those who hold tax-deferred accounts. This evidence further supports the hypothesis that older investors are likely to prefer dividends for consumption reasons. Younger investors who are less likely to have such consumption preferences choose to hold higher dividend yield stocks in their tax-deferred accounts.

Overall, the results from our non-parametric tests have the following implications: (i) retail investors as a group prefer non-dividend paying stocks over dividend paying stocks, but within the retail investor group, older and low income investors prefer dividend paying stocks over non-dividend paying stocks, (ii) within the set of dividend paying stocks, retail investors as a group prefer high DY stocks over low DY stocks, where the preference differential is stronger among older and low income investors, and (iii) age appears to be the dominant determinant of retail investors' dividend preferences. These results are consistent with the existence of age and tax induced retail investor dividend clienteles.

III.E Dividend Preference and Risk Aversion

Investors with lower risk tolerance may prefer high DY stocks simply due to their bond-like risk-return characteristics. If relatively less wealthy and older investors have lower risk tolerance, they may prefer to hold high DY stocks not due to tax or consumption reasons but due to an appropriate match between their risk profile and the risk-return characteristics of high DY stocks. In other words, the evidence of age and tax clienteles that we have uncovered may simply reflect a risk clientele. Alternatively, the three clientele effects may co-exist.

To examine the relation between dividend preference and risk aversion, we use two proxies of risk aversion: (i) the diversification level of the investor's equity portfolio, and (ii) the proportion of the total portfolio allocated to mutual funds. The diversification measure we employ is the sum of squared portfolio weights (Blume and Friend 1975, **?**).[11] The results are qualitatively similar with the two measures, so we report the results with the first risk

[11]The degree of diversification of a portfolio can be measured as its deviation from the market portfolio (Blume and Friend 1975). The weight of each security in the market portfolio is very small, so the diversification measure can be approximated as $\text{DIV} = \sum_{i=1}^{N}(w_i - w_m)^2 = \sum_{i=1}^{N}(w_i - \frac{1}{N_m})^2 \approx \sum_{i=1}^{N} w_i^2$, where N is the number of securities held by the investor, N_m is the number of stocks in the market portfolio, w_i is the portfolio weight assigned to stock i in the investor portfolio and w_m is the weight assigned to a stock in the market portfolio ($w_m = 1/N_m$). A lower value of DIV reflects a higher level of diversification.

aversion measure only. We proceed as follows: first, at the end of each month, we divide investor portfolios into five categories on the basis of their diversification levels. Next, we compute the average PDY for each of these diversification quintiles in each month. Finally, we compute the average of the monthly PDY measures to obtain the average portfolio dividend yield (PDY) for each diversification quintile for the entire sample period.

The results are presented in Table IX. In each diversification quintile, we find that the PDY of older (low income) investors is greater than the PDY of younger (high income) investors. This is consistent with our previous findings. In addition, we find that the PDY increases with the level of diversification and the increase is almost monotonic. This suggests that the risk preference of investors influences their dividend preference. However, it is worth noting that among older investors, the difference between the PDY of bottom diversification quintile (lowest risk aversion) and top diversification quintile (highest risk aversion) is very small (0.001) and statistically insignificant. This PDY differential is also small (0.048) but statistically significant for low income investors. These results suggest that both low income and older investors prefer high dividend yield stocks irrespective of their level of risk aversion.

In sum, these results suggest that a risk-induced retail investor dividend clientele exists and this effect is distinct from age and tax-induced dividend clienteles documented earlier.

III.F Summing Up: Regression Tests

To further explore the nature of the dividend preferences of retail investors and to estimate the relative strengths of age, tax, and risk clienteles, we estimate a regression model where the dependent variable is the average quarterly portfolio dividend yield of a household during a chosen time-period and a set of variables that characterize household demographics and portfolio characteristics are employed as dependent variables. In the regression specification, *Income* is the total annual household income, *Age* is the age of the head of the household, the *Diversification Level* variable (a proxy for an investor's risk aversion) is the negative of sum of squared portfolio weights,[12] and *Family Size* measures the number of people (children and adults) in the household. The *Professional* and *Retired* dummy variables represent occupation categories where the professional job category includes investors who hold technical and managerial positions. Investors who are not in these two categories belong to the non-professional category which consists of students, house-wives, blue-collar workers, sales

[12]As diversification level increases, the sum of squared portfolio weights decreases but the negative of this sum increases. Thus, a negative sign prefix makes it easier to interpret the coefficient estimate of the diversification variable.

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 average of monthly buy and sell turnovers, *Portfolio Size* is the average size of the household portfolio, and *Portfolio Performance* is the risk-adjusted performance (Sharpe Ratio) of the household. Finally, *RMRF, SMB, HML,* and *UMD* 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.[13] The factor exposures provide an accurate measure of the systematic risk of an investor's portfolio.[14]

The estimation results are presented in Table X. To allow for direct comparisons among the coefficient estimates, all variables are standardized.[15] For robustness, we first carry out the estimation separately for the first half (1991-93) and the second half (1994-96) of our sample period, and then for the entire 1991-96 sample-period. The results for the 1991-93 and 1994-96 sub-periods are very similar, so in our discussion we focus exclusively on the full sample results. To ensure that our results are robust to concerns about multi-collinearity, we compute the variance inflation factor (VIF) for each of the explanatory variables.[16] We find that the VIF is not greater than two for any of our explanatory variables which suggests that multi-collinearity is unlikely to influence our regression estimates.

The regression model estimates provide evidence of retail dividend clienteles. The *Age* variable has a positive and significant coefficient estimate (0.077 with a t-stat of 6.97) and the *Retired Dummy* has a positive and significant estimate too (0.028 with a t-stat of 2.26). Taken together, these coefficient estimates suggest that older investors exhibit a strong preference for dividends, all else equal. We interpret these findings as evidence of an age-driven dividend clientele where older investors prefer high DY stocks perhaps because they have greater consumption needs. The consumption needs of a household are also proxied by the *Family Size* variable – larger families are likely to have a greater need for a regular income stream and hence they may prefer high DY stocks. Our results do not support this hypothesis. We find that the coefficient estimate of the *Family Size* variable is negative and statistically

[13]Households with less than twelve months of returns data are excluded from this analysis.

[14]The results are qualitatively similar when we use the total risk of the portfolio, as measured by the standard deviation of portfolio returns, to control for the riskiness of the portfolio.

[15]If x is a raw variable, the standardized variable z is obtained by using the following linear transformation: $z = \frac{x-\mu}{\sigma}$. Here, μ is the mean of x and σ is its standard deviation. The standardized variable z has a mean of 0 and a standard deviation of 1.

[16]VIF measures the degree to which an explanatory variable can be explained by other explanatory variables in a regression model. For explanatory variable i, $\text{VIF}_i = 1/(1 - R_i^2)$ where R_i^2 is the R^2 in the regression where explanatory variable i is used as a dependent variable and other explanatory variables are used as independent variables. As a rule of thumb, multi-collinearity is not of concern as long as VIF < 2.

insignificant (-0.016 with a t-stat of -1.05).

For evidence of a tax-induced dividend clientele, we examine the coefficient estimate of the *Income* variable (marginal tax rate proxy). The coefficient estimate is negative and statistically significant (-0.023 with a t-stat of -2.50) which suggests that low (high) income investors (with lower marginal tax rates) are likely to hold high (low) DY stocks. More importantly, the relation between PDY and income is strong even in the presence of a variety of control variables. This provides evidence consistent with the existence of a tax-induced retail dividend clientele. Furthermore, the *TDA Dummy* has a positive coefficient (0.027 with a t-stat of 2.91) which suggests that investors hold higher yield stocks in tax-deferred accounts. Consistent with the evidence presented in Barber and Odean (2003), this result suggests that the dividend preferences of investors are influenced by tax considerations.

Finally, using the diversification level of a household's equity portfolio as a proxy for risk aversion, we examine if a risk-induced dividend clientele exists. The coefficient estimate of the *Diversification Level* variable is positive and significant (0.019 with a t-stat of 2.77). This suggests that retail investors with higher levels of diversification, who are likely to be more risk averse, hold high DY portfolios. In other words, this evidence is consistent with a risk-induced retail dividend clientele.

The other coefficient estimates are either consistent with previous findings or appear intuitive. For instance, larger portfolios have higher portfolio yields which is consistent with the findings in Scholz (1992). The negative coefficient estimate of the *Portfolio Turnover* variable suggests that investors who hold a high DY portfolio are likely to trade less frequently. 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.

III.G Which Clientele is Dominant?

We examine the relative strengths of age, tax, and risk clienteles by comparing the coefficient estimates of the portfolio dividend yield equation. Of the three clientele variables, *Age*, *Income* and *Diversification Level*, the *Age* variable has the largest (in absolute terms) coefficient. This indicates that the portfolio dividend yield is most sensitive to the age of the head of the household and hence the age clientele appears to be dominant. A one standard deviation shift in the *Age* variable corresponds to a 0.077% shift in the quarterly portfolio dividend yield.

The coefficient estimates of *Income* and *Diversification Level* variables are comparable – a one standard deviation shift in the *Income* (*Diversification Level*) variable corresponds to

a 0.023% (0.019%) shift in the quarterly portfolio dividend yield. Hence, the strengths of tax and risk clienteles appear to be similar in magnitude.

Overall, the regression estimates show that in our sample of retail investors, the preference for dividends vary based on age, taxes, and risk aversion. Furthermore, the influence of clientele variables on PDY is significant not only statistically but also economically. Our evidence on the existence of tax clienteles reinforce the findings from previous studies that have provided indirect support for the existence of tax clienteles (e.g., Elton and Gruber (1970), Eades, Hess, and Kim (1984), Barclay (1987), Green and Rydqvist (1999), Graham, Michaely, and Roberts (2003)). The results are also consistent with Poterba and Sawmick (2002) who show that U.S. households are responsive to their marginal tax rates when making broad asset allocation decisions.

IV Trading Behavior around Dividend Events

To further investigate whether retail investor dividend clienteles exist, we examine the trading activities of nine groups of retail investors, formed on the basis of age and income. If retail dividend clienteles exist, these investor groups are likely to exhibit abnormal trading activities around salient dividend events consistent with their dividend preference. For instance, high income investors with higher marginal tax rates may sell a dividend paying stock prior to the ex-dividend date so that they are taxed at the capital gains rate, which is lower than the dividend tax rate. Following the ex-date, these investors are likely to be net buyers. In contrast, investors with low income (and lower marginal tax rates) are likely to hold the stock or may engage in buying prior to the ex-dividend date and may engage in selling following the ex-date. Similarly, older investors with a strong dividend preference are likely to be net buyers prior to the ex-date, especially among high DY stocks. In contrast, the trading behavior of other age groups is likely to be less pronounced around dividend events.

Previous studies have used the aggregate trading volume (either signed or unsigned) to investigate the existence of dividend clienteles. However, if there is heterogeneity in the dividend preference of investors within the group of retail investors, aggregate trading volume, both signed and unsigned, may fail to detect clientele trading. The demographic information (age and income) along with a signed volume reaction measure (buy-sell imbalance) provide more power to detect clientele trading, if it exists.

Since factors other than taxes, consumption needs, and risk-aversion are likely to induce trading around dividend events, detecting clientele trading is likely to be difficult. For

instance, investors' reluctance to realize losses (Odean 1998) may lead to a muted sell reaction around dividend events even when clientele effects predict net selling by retail investors. Furthermore, given the salient nature of dividend events, they are likely to induce retail investors, especially the less sophisticated investors, to engage in attention-driven buying (Lee 1992, Barber and Odean 2001). As a result, at least some buying is likely to be attention-driven. Again, this may make the detection of clientele based trading difficult. However, by comparing the abnormal directional volume reactions between the pre-event and post-event periods and cross-sectionally across investor groups, we are able to separate clientele based trading from trading induced by attention and the disposition effect.

We consider four types of dividend events: (i) ex-dividend dates, (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 buy-sell imbalance of investor group i for stock j on day t (or in month t) is defined as

$$\text{BSI}^i_{jt} = \frac{B^i_{jt} - S^i_{jt}}{B^i_{jt} + S^i_{jt}} \times 100 \tag{5}$$

where B^i_{jt} is the total buy volume of group i for stock j on day t (or in month t) and S^i_{jt} 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 BSI levels on days $t-20$ to $t-16$ and days $t+16$ to $t+20$.[17]

$$\text{EBSI}^i_{jt} = \text{BSI}^i_{jt} - \overline{\text{BSI}}^i_j \tag{6}$$

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

IV.A Ex-Dividend Days

There are 2,775 dividend paying stocks in our sample and they made 54,457 quarterly cash dividend payments during the 1991-96 sample period. Table XI reports the average excess buy-sell imbalance (EBSI) of different groups of investors around ex-dividend dates. For the entire group of retail investors, the EBSI is positive on the ex-day (EBSI = 2.22) as well

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

as in the week prior to the event (EBSI = 3.51) and in the week following the event (EBSI = 3.22). The uniformly positive EBSI suggests that different groups of investors may be 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 event date and during the week following the event. The difference between the event-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 event day (EBSI = 2.26, 4.10) but not on the ex-dividend date and the week following it. The EBSI differentials between the event-day and pre-event week and post-event week and pre-event week are both negative and statistically significant (EBSI differentials = $-5.68, -4.83$). Overall, the trading activities of age groups indicate that older investors buy dividends in the weeks prior to the ex-date and are consistent with the evidence of an age clientele uncovered earlier.

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 investor group, consistent with the clientele hypothesis, there is relatively more buying prior to the ex-date – the difference between the event-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 the high income investor group. Overall, these results are consistent with low income (low tax rate) investors buying dividends in the week prior to the ex-day and provide support for the existence of tax-induced retail investor dividend clientele.

Comparing the trading behavior of all retail investors around ex-dividend dates of low DY and high DY stocks (see Panels B and C), we find that the volume reaction is stronger for high DY stocks. Furthermore, consistent with the attention hypothesis, there is more buying around ex-dates of high DY stocks among *all* investor groups. A considerably stronger evidence of age and tax clienteles are found when we examine the trading behavior of investor groups around the ex-dividend dates of high DY stocks. Both older and low income investors are strong net buyers in both weeks prior to the event date – the EBSI differential between the event 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 for older and low-income investor groups respectively. There is also low level of attention-driven buying following the ex-date among all groups of investors but consistent with the clientele hypothesis, there is relatively less post-event buying by older and low

income investors.

IV.B Ex-Day Premium and Retail Investor Characteristics

If the trading activities of retail investors around dividend events comprise a non-significant proportion of the total trading volume around these events, the personal characteristics of retail investors that are the primary determinants of their dividend preference may reflect themselves in stock returns. In particular, retail investor characteristics may be important determinants of the ex-day premium. Such a relation might be stronger among small-cap stocks and other stock categories where retail investors are more likely to be the marginal price-setting investors.

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

$$\text{PREM} = \frac{P_{\text{cum}} - P_{\text{ex}}}{D}. \tag{7}$$

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*), the average income (*Income*) and the average diversification level (*Diversification Level*) 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 only the ex-day events within the 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 three measures of a given stock's retail clientele, namely, *Age*, *Income*, and the *Diversification Level*. As before, to allow for direct comparisons among the coefficient estimates, all variables are standardized.

In the absence of market frictions, the fall in stock price on the ex-dividend day is equal to the dividend payment and the ex-day premium is equal to 1 (see equation 7). 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 higher (lower) if the marginal investors value dividends more (less)

than capital gains and if investors are indifferent between the two modes of payment, the ex-day premium is equal to 1. In the extreme case where investors are willing to pay a premium for cash dividends, the ex-day premium may even be greater than 1.

We have already shown that older, low income, and more risk averse investors hold high DY stocks. These groups of investors are likely to value dividends more than capital gains. So, we expect a positive relation between age and the ex-day premium, a negative relation between income (a proxy for marginal tax rates) and the ex-day premium, and a positive relation between diversification level (a proxy for risk aversion) and the ex-day premium.

Table XII reports the estimation results in a pooled regression specification. Panel A reports the pooled regression estimates with unadjusted ex-dividend day price while Panel B reports the estimates when the ex-dividend day price is adjusted using the CAPM model to take into account the expected price movements on the ex-dividend date. We find that the relation between the ex-day premium and investor characteristics is very weak when all ex-day events are considered. The coefficient estimates for all three investor variables, *Age*, *Income*, and *Diversification Level*, are statistically insignificant. However, the signs of the *Age* and *Income* variables are as expected – positive for the *Age* variable and negative for the *Income* variable. This suggests that stocks with a greater ownership of high income investors have smaller ex-day premium which is consistent with the existence of a tax-induced dividend clientele. The positive coefficient of the *Age* variable indicates that the ex-day premium is likely to be higher for stocks with greater ownership by older investors. Again, this is consistent with age clienteles where older investors assign a greater value to dividends.

Our results are considerably stronger for small-cap stocks (bottom size quintile). For size quintile 1, the coefficient estimate of the *Age* variable is 0.055 (t-stat = 2.24) and the coefficient estimate of the *Income* variable is -0.035 (t-stat = -1.98). In contrast, the coefficient estimate of the *Diversification Level* variable is still statistically insignificant. The relative strength of the small-cap results is consistent with the findings in Kumar and Lee (2002), who show that retail investor sentiment has incremental explanatory power to explain cross-sectional variation in small stock returns, particularly among lower-priced stocks with low institutional ownership.

For robustness, we re-estimate the pooled regression specifications after adjusting the ex-dividend day price using the CAPM model. The qualitative nature of our results remain virtually unchanged. In fact, we find that the coefficient estimates of the *Age* and *Income* variables are larger in absolute magnitude – 0.062 with a t-stat of 2.51 and -0.050 with a t-stat of -2.04 respectively.

Given that all variables are standardized, we can examine the economic significance of our results just by comparing the coefficient estimates. Among small-cap stocks, a one standard deviation shift in the *Age* variable corresponds to a 0.055 (with unadjusted ex-dividend day price) or a 0.062 (with adjusted ex-dividend day price) shift in the ex-day premium while a one standard deviation shift in *Income* corresponds to a -0.035 or a -0.050 shift in the ex-day premium. These numbers indicate that the potential impact of age and tax induced retail dividend clienteles on ex-day stock return is economically significant.

IV.C Announcement Events

The trading behavior of retail investors around dividend announcement events provide further evidence of clientele driven trading. Investors who are attracted towards dividend paying stocks are likely to be net buyers following a dividend announcement. In contrast, investors with weak or no preference for dividends are less likely to exhibit abnormal trading (buying or selling) following dividend announcements. In addition, there is likely to be considerable attention-driven buying following announcement events.

Table XIII presents the average excess buy-sell imbalance (EBSI) of different groups of investors around announcement events. In Panel A, we report the EBSI for all announcement events while Panels B and C report the EBSI for low (bottom DY quintile) and high (top DY quintile) DY stocks respectively. The 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 announcement events is weaker.

Examining the volume reaction across investor groups, as expected, we find that the post-event week EBSI is positive and stronger for both older and low-income investor groups. Furthermore, the post-event week EBSI is considerably stronger for high DY stocks – for the older and low income investor groups, the post-event week EBSI are 13.06 and 5.76 respectively. The EBSI differentials between event day and pre-event week and post-event week and pre-event week are both positive for low income (2.84 and 3.32 respectively) and older (7.93 and 11.35 respectively) investor groups. Overall, the post-event EBSI for older group is stronger relative to the post-event EBSI for low income investors.

Consistent with the attention hypothesis, there is considerable net buying among several investor groups following announcement events. However, the cross-sectional EBSI differentials across age and income groups are consistent with the clientele hypothesis. The buying activities are more pronounced among investors with stronger dividend preference.

IV.D Dividend Initiation and Omission Events

For further evidence of dividend clienteles, we examine if the trading activities of retail investors around dividend initiation and omission events are consistent with the clientele hypothesis. Dividend initiations and omissions are salient events that represent a significant shift in corporate policy. Given their salience, investors with strong dividend preferences are likely to exhibit strong volume reactions.

We define dividend initiation events as cases where a stock that had not paid dividends in the past year initiates a cash dividend payment. Our sample of dividend omission events consists of missed quarterly cash dividend payments. There are 494 dividend initiation and 226 dividend omission events during the 1991-96 sample period. To detect clientele trading, we follow a slightly different approach. Unlike the short-term volume reaction we examine around dividend ex-day and announcement events, we measure the excess monthly ownership around initiation and omission events 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 an investor group's ownership in a stock.[18] Corresponding to each event, we also define a benchmark ownership level for each group. The benchmark ownership level is assumed to be 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 12-month window around the event date.

Examining the behavior of the entire group of retail investors, we find that the ownership changes following both dividend initiations and omissions are quite small and furthermore, the shifts are weaker for omissions (see Table XIV). 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 the stock by an average of 0.18% in the event month and by 0.28% in the month following the event. Similarly, the corresponding ownership changes in the low income investor group are 0.14% and 0.25% respectively. However, six months after the event, the group ownerships are only marginally different from their pre-event levels.

In contrast to dividend initiation events, dividend omissions do not have any perceptible influence on the behavior of retail investors as a group. Examining the behavior within age

[18]The results are similar when we use the total market capitalization of the stock, instead of the total portfolio value, to measure group-level ownership.

and income groups, we find that older investors do not exhibit any 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 the ownership level of high income investors. Overall, investors' trading activities around dividend omission events do not provide any additional evidence supporting the dividend clientele hypothesis.

V Robustness Tests

V.A Stability of Dividend Preference: Split Sample Tests

Our empirical analysis has focused primarily on the aggregate preference of retail investors and investor groups formed on the basis of age, income, risk-aversion, etc. It is not transparent from this analysis if the dividend preference of an investor is stable through time or whether our aggregate level measures primarily capture the dividend preference of new investors.

We take a closer look at the stability of dividend preference of individual households using a split-sample test. For investors who are present in both halves of our sample-period, we compute the average dividend yield of each investor's portfolio in both halves (1991-93 and 1994-96) of our sample-period and examine the shifts in the dividend yield of each investor across the two sub-periods. A relatively simple correlation test provides strong evidence of a stable dividend preference. The rank correlation between the portfolio dividend yields in the two sub-periods is quite large (0.79).

To further explore the stability of investors' dividend preference, we divide each portfolio into deciles in both sub-periods and examine the transitions among PDY decile groups between the two sub-periods (see Table XV). We find that a considerable proportion (21-61%) of investors stay within their decile group and a large fraction (58-85%) of investors stay within one of their neighboring deciles. This suggests that the dividend preference of investors in our sample is stable and does not change significantly during the six-year period.

V.B Dividend Preference and the Disposition Effect

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 underneath the observed clientele effects. It is conceivable that investor portfolios have high dividend yields simply because they buy lower priced stocks and exhibit a greater propensity to hold on to those stocks when they suffer losses. In other words, the high portfolio yields we observe is not so much due to retail investors' preference for high dividends but due to their greater reluctance to realize losses, i.e., the disposition effect (Shefrin and Statman 1985, Odean 1998). To examine this possibility, we examine the relation between disposition effect (DE) and portfolio dividend yield (PDY).

We measure the disposition effect following the methodology in Odean (1998).
If

N_{gr} = number of trades where a gain is realized,
N_{lr} = number of trades where a loss is realized,
N_{gp} = number of potential trades where there is a paper gain,
N_{lp} = number of potential trades where there is a paper loss,
PGR = proportion of gains realized,
PLR = proportion of losses realized, and
DE = disposition effect,

then, considering the set of trades for a chosen set of investors and for a specified time period, we can compute

$$\text{PGR} = \frac{N_{\text{gr}}}{N_{\text{gr}} + N_{\text{gp}}}, \quad \text{PLR} = \frac{N_{\text{lr}}}{N_{\text{lr}} + N_{\text{lp}}}, \quad \text{and finally,} \tag{8}$$

$$DE = \text{PGR} - \text{PLR}. \tag{9}$$

A value of DE > 0 indicates that a smaller proportion of losers are sold compared with the proportion of winners sold and thus provides evidence in favor of the disposition effect.

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. To further explore the relation between the disposition effect and portfolio yield, first, we form DY quintiles by sorting all stocks in our sample using the DY measure. Next, as before, we form investor groups by sorting on age, income, and diversification level variables. Finally, we compute DE for each investor group in each DY quintile.

Table XVI reports the results. We find that DE decreases almost monotonically with

DY for all nine investor groups. The DE differential between the high DY quintile and low DY quintile is significantly negative for each investor group. These results indicate that the disposition effect is unlikely to be the key determinant of investors' strong dividend preferences. That is, the observed dividend clienteles do not result from a "naive" investor trading behavior where they buy lower-priced stocks and fail to sell them when they suffer losses thereby increasing the dividend yield of their portfolios.

V.C Dividend Preference at the Time of Purchase

It is possible that our dividend preference measures based on investors' end-of-month portfolio positions are noisy. So, we estimate the dividend preferences of investor groups on the basis of their purchase decisions. Using the dividend yields of stocks at the time of purchase, we compute a value-weighted average dividend yield for investor groups formed on the basis of age, income, and occupation. The weights are determined by the dollar value of the buy trades.

The results are reported in Table XVII. We find that the qualitative nature of our previous results remain unchanged. Consistent with our portfolio based results, we find that older (low-income) investors buy a greater proportion of high dividend yield stocks than younger (high-income) investors. For instance, in 1991, the average quarterly dividend yield of stocks purchased by older and younger investor groups are 0.581% and 0.350% respectively. The difference of 0.231% is statistically significant at the 1% level. The difference between the dividend preference of low-income and high-income investors is weaker but nevertheless, statistically significant at the 5% in five out of six years. As before, the dividend preference of occupation groups reinforce our findings for age and income groups.

VI Summary and Conclusion

In this paper, we study the stock holdings and trading behavior of a representative group of more than 60,000 households and find evidence consistent with dividend clienteles. The stock holdings of retail investors indicate a preference for dividend yield that increases with age (consistent with life-cycle or consumption preferences) and decreases with income (consistent with low-tax investors holding high-yield stocks) and risk aversion. Our evidence is consistent with the existence of tax clienteles and reinforces the findings from previous studies that have provided indirect support for the existence of tax clienteles (e.g., Elton and Gruber

(1970), Eades, Hess, and Kim (1984), Barclay (1987), Green and Rydqvist (1999), Graham, Michaely, and Roberts (2003)).

The stock trading behavior of retail investors provide reinforcing evidence of these dividend preferences. Older, low-income investors disproportionally purchase stocks before the ex-dividend day. Among small stocks, the ex-day premium increases with age and decreases with income, which is consistent with tax explanations of the ex-day premium. We also find evidence that older, low-income investors purchase stocks after they initiate dividends. Finally, we document an interesting behavioral result that is consistent with the attention hypothesis (Lee 1992, Barber and Odean 2001): older and low-income investors disproportionally purchase stocks on and after dividend announcement dates.

This research has important policy implications. Recently, the taxation of dividends has been reduced dramatically, from rates as high as 39.6% to rates as low as 15% for the richest investors and even lower for the less wealthy. The reduced dividend taxation has received wide criticism as being a "tax break for the rich." The results from our paper suggest that this conclusion may be overstated. Given the strong dividend preference of older and low-income investor groups, the benefits of Bush's proposed policy may be more widespread than currently believed. While it is true that the wealthy own more stocks than the poor (Allen and Michaely 2003), our results indicate that the stock holdings of the old and the less wealthy are skewed more towards dividends than are the holdings of the wealthy. Therefore, our evidence suggests that, relative to their wealthy counterparts, the income stream of older and less wealthy investors benefits more from the recent reduction in dividend taxation.

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Table I
Age and Income Groups: Summary Statistics

This table reports the portfolio summary statistics for groups of investors sorted by age and income variables. Age and income are available for 31,260 investors in our sample. Panel A reports the distribution of investors across age and income categories. Panel B reports the means of the following portfolio variables: (i) portfolio size, (ii) trade size, (iii) portfolio turnover, (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 factor exposure, (ix) portfolio's high-minus-low factor exposure, and (x) portfolio's up-minus-down 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 retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period.

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	Portf Size	Trade Size	Portf Turn	MF Own	Num Stks	SR	Portf β	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
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

Table II

Aggregate Retail Preference for Dividend Paying Stocks

This table reports different measures of retail preference for dividend paying stocks. In Panel A, we report the average retail ownership (as measured by the total holdings of retail investors in our sample) in dividend paying and non-dividend paying stocks for each year in our 1991-96 sample period. For a direct comparison, the average institutional holdings in dividend and non-dividend categories are also shown. Panel B reports the actual portfolio weight in dividend paying stocks in the aggregate retail investor portfolio. The expected portfolio weight represents the weight of dividend paying stocks in the market portfolio. In Panel C, the aggregate retail ownership in dividend paying and non-dividend paying stocks is shown for each of the five size quintiles where these quintiles are formed at the end of each year using the market capitalization at the end of December. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period while the institutional holdings data are from Thomson Financial. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in total ownerships and portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

Panel A: Aggregate Retail and Institutional Ownership (in percent)

	1991	1992	1993	1994	1995	1996
Retail Investors						
Dividend-Paying Stocks (DIV)	0.071	0.071	0.061	0.042	0.035	0.032
Non-Paying Stocks (NDIV)	0.165	0.171	0.139	0.096	0.077	0.063
Percent Difference	133.63**	139.95**	128.85**	125.57**	121.57**	97.46**
Institutional Investors						
Dividend-Paying Stocks (DIV)	27.85	30.79	31.52	32.76	33.84	33.68
Non-Paying Stocks (NDIV)	13.43	15.37	16.59	18.44	20.23	21.36
Percent Difference	−51.78**	−50.07**	−47.37**	−43.71**	−40.23**	−36.59**

Panel B: Portfolio Weights (in percent) in Aggregate Retail Portfolio

	1991	1992	1993	1994	1995	1996
Actual Weight in Dividend-Paying Stocks	73.12	70.50	69.48	69.20	68.65	66.01
Expected Weight in Dividend-Paying Stocks	81.59	78.71	76.71	74.06	73.66	71.23
Actual − Expected	−8.47**	−8.21**	−7.22**	−4.86**	−5.01**	−5.23**

Table II(Continued)

Aggregate Retail Preference for Dividend-Paying Stocks

Panel C: Aggregate Retail Ownership (in percent), Sorted by Size

Size Quintile	1991	1992	1993	1994	1995	1996
Quintile 1						
Dividend-Paying Stocks	0.068	0.063	0.055	0.039	0.033	0.030
Non-Paying Stocks	0.125	0.131	0.107	0.074	0.059	0.051
Percent Difference	85.38**	109.53**	94.09**	91.36**	78.33**	67.73**
Quintile 2						
Dividend-Paying Stocks	0.062	0.066	0.063	0.046	0.032	0.028
Non-Paying Stocks	0.130	0.137	0.112	0.078	0.062	0.052
Percent Difference	109.03**	109.51**	78.12**	70.40**	95.81**	86.04**
Quintile 3						
Dividend-Paying Stocks	0.071	0.072	0.058	0.038	0.028	0.023
Non-Paying Stocks	0.131	0.139	0.113	0.078	0.063	0.052
Percent Difference	85.86**	93.24**	93.56**	105.24**	126.60**	123.17**
Quintile 4						
Dividend-Paying Stocks	0.050	0.061	0.041	0.046	0.036	0.027
Non-Paying Stocks	0.130	0.138	0.113	0.079	0.063	0.053
Percent Difference	161.38**	125.45**	173.34**	69.07**	76.75**	92.99**
Quintile 5						
Dividend-Paying Stocks	0.056	0.066	0.062	0.044	0.035	0.032
Non-Paying Stocks	0.131	0.138	0.112	0.078	0.063	0.053
Percent Difference	133.11**	109.01**	81.79**	77.04**	79.01**	65.62**

Table III

Aggregate Retail Preference for Dividend Yields Among Dividend-Paying Stocks

This table reports the normalized portfolio weights of dividend yield (DY) quintiles in the aggregate retail portfolio, where the total portfolio weight in dividend paying stocks is used as the normalizing variable. The aggregate retail portfolio is constructed at the end of each month by combining the portfolios of all retail investors in our sample. The dividend yield (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 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. In Panel A, we report the actual (or observed) portfolio weights and in Panel B we report the expected portfolio weights, which represent the weights in the market portfolio. In Panel C, the excess (Actual − Expected) weights in the observed investor portfolio are shown. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

Panel A: Actual Normalized Portfolio Weights in Dividend Paying Stocks

DY Quintile	1991	1992	1993	1994	1995	1996
Low	18.40	20.16	19.69	18.25	18.61	17.35
Q2	20.32	14.99	11.11	12.17	16.15	21.86
Q3	19.27	19.70	18.20	21.42	24.33	15.79
Q4	19.26	19.76	22.84	20.38	16.33	21.78
High	22.75	25.39	28.16	27.77	24.58	23.21

Panel B: Expected Normalized Portfolio Weights in Dividend Paying Stocks

DY Quintile	1991	1992	1993	1994	1995	1996
Low	15.67	18.92	16.04	15.61	16.09	14.04
Q2	21.15	16.25	14.07	13.52	15.02	19.36
Q3	21.86	23.03	21.36	23.89	24.52	21.34
Q4	22.68	23.26	23.72	19.46	21.78	24.44
High	16.27	16.51	22.58	25.04	19.89	18.06

Panel C: Excess Normalized Weights in the Aggregate Investor Portfolio

DY Quintile	1991	1992	1993	1994	1995	1996
Low	2.73^{**}	1.24^{*}	3.65^{**}	2.65^{**}	2.52^{**}	3.31^{**}
Q2	-0.83	-1.26^{*}	-2.96^{**}	-1.35^{*}	1.13	2.51^{**}
Q3	-2.59^{**}	-3.33^{**}	-3.16^{**}	-2.47^{**}	-0.19	-5.55^{**}
Q4	-3.41^{**}	-3.50^{**}	-0.87	0.92	-5.45^{**}	-2.66^{**}
High	6.48^{**}	8.88^{**}	5.58^{**}	2.74^{**}	4.70^{**}	5.15^{**}

Table IV

Cross-Sectional Variation in Retail Preference for Dividend-Paying Stocks: One-Dimensional Sorts

This table reports the total portfolio weights in dividend paying stocks in the aggregate portfolios of three different groups of retail investors, formed on the basis of age, income, and occupation. 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 portfolio weights in dividend paying stocks in the aggregate retail portfolio are also shown. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

Investor Group	1991	1992	1993	1994	1995	1996
All Investors						
	73.12	70.50	69.48	69.20	68.65	66.01
Age Groups						
Below 45 (Younger)	65.82	62.22	59.53	60.15	59.22	57.51
45-65	70.27	69.02	68.06	67.18	66.10	65.42
Above 65 (Older)	81.83	79.73	77.24	76.65	78.50	78.32
Older − Younger	16.01**	17.50**	17.71**	16.50**	19.29**	20.81**
Income Groups						
Below 40K (Low)	74.71	71.97	68.66	69.04	68.75	66.04
40-75K	71.17	68.76	66.65	66.63	65.50	64.82
Above 75K (High)	70.99	68.90	67.65	67.05	67.65	66.06
Low − High	3.72*	3.07*	1.01	1.99	1.10	−0.02
Occupation Categories						
Professional	68.65	67.85	65.63	64.05	64.43	61.71
Non-Professional	70.06	65.58	62.98	65.02	63.39	66.32
Retired	81.67	80.03	78.58	78.18	78.57	79.41
Retired − Professional	13.02**	12.18**	12.95**	14.13**	14.14**	17.70**

Table V

Cross-Sectional Variation in Retail Preference for Dividend-Paying Stocks: Two-Dimensional Sorts

This table reports the total portfolio weights in dividend paying stocks in the aggregate portfolios of nine different groups of retail investors, formed by sorting on age and income. 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 holdings data are from a large discount brokerage house in the US. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

Age Groups	Income Groups	1991	1992	1993	1994	1995	1996
	Below 40K (Low)	67.27	62.86	63.44	62.84	60.07	61.38
Younger	*40-75K*	66.40	62.89	59.66	59.46	57.19	56.30
	Above 75K (High)	63.79	60.69	57.70	59.93	61.43	57.78
	Low - High	3.48*	2.17*	5.74**	2.91*	−1.36	3.60*
	Below 40K (Low)	72.36	69.30	65.57	66.24	68.79	66.21
Age 45-65	*40-75K*	68.97	67.82	66.45	66.99	64.70	65.36
	Above 75K (High)	71.20	70.31	70.73	67.62	66.98	65.21
	Low - High	1.16	−1.01	−5.16**	−1.38	1.81	1.00
	Below 40K (Low)	82.92	80.48	78.02	78.54	77.84	78.40
Older	*40-75K*	81.07	79.12	77.01	74.95	76.99	75.98
	Above 75K (High)	82.32	80.41	77.20	78.48	80.92	80.93
	Low - High	0.60	0.07	0.82	0.06	−3.08*	−2.53*

Table VI

Cross-Sectional Variation in Retail Preference for Dividend Yields: One-Dimensional Sorts

This table reports the total weights in the aggregate portfolio of three different groups of investors formed on the basis of age, income, and occupation. The total portfolio weight assigned to stocks in each of the five dividend yield quintiles is reported. 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 dividend yield (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 December. The total portfolio weight assigned to stocks in a DY quintile is computed at the end of each month and the sample-period averages of these monthly weights are reported. The portfolio weights assigned to stocks in each of the five dividend yield quintiles in the aggregate retail portfolio are also shown. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

	Dividend Yield Quintile					
Investor Group	Low	Q2	Q3	Q4	High	High−Low
All Investors						
	19.58	16.10	19.78	20.06	24.48	4.90**
Age Groups						
Below 45 (Younger)	24.44	16.93	17.82	18.72	22.09	−2.35**
45-65	21.90	17.76	17.67	19.09	23.58	1.68*
Above 65 (Older)	16.16	14.18	18.77	19.79	31.09	14.93**
Older − Younger	−8.28**	−2.75**	0.95	1.07	9.00**	
Income Groups						
Below 40K (Low)	19.23	14.93	17.37	19.45	29.02	9.79**
40-75K	20.15	16.45	18.33	19.60	25.47	5.32**
Above 75K (High)	22.52	17.79	18.24	19.12	22.34	-0.18
Low − High	−3.29**	−2.86**	−0.87	0.33	6.68**	
Occupation Categories						
Professional	26.39	16.78	16.17	17.74	22.91	−3.48**
Non-Professional	21.69	15.34	18.02	20.10	24.85	3.17**
Retired	17.55	16.61	20.11	20.42	25.30	7.74**
Retired − Professional	−8.84**	−0.17	3.94**	2.68**	2.39*	

Table VII

Cross-Sectional Variation in Retail Preference for Dividend Yields: Two-Dimensional Sorts

This table reports the total portfolio weights in the aggregate portfolios of nine different groups of retail investors, formed by sorting on age and income. The total portfolio weight assigned to stocks in each of the five dividend yield (DY) quintiles is reported. 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 sample-period averages of these monthly weights are reported. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

		Dividend Yield Quintile					
Age Group	Income Group	Low	Q2	Q3	Q4	High	High−Low
	Below 40K (Low)	24.65	18.17	17.04	17.39	22.75	−1.90*
Younger	*40-75K*	25.73	17.23	17.13	17.94	21.96	−3.77**
	Above 75K (High)	22.59	16.31	18.88	20.39	21.83	−0.76
	Low − High	2.06*	1.86*	−1.84*	−3.00**	0.92	
	Below 40K (Low)	19.82	15.23	17.27	18.93	28.75	8.93**
Age 45-65	*40-75K*	20.78	17.27	18.00	19.25	24.69	3.91**
	Above 75K (High)	23.87	19.13	17.33	19.00	20.67	−3.20**
	Low − High	−4.05**	−3.90**	−0.06	−0.07	8.08**	
	Below 40K (Low)	15.71	12.32	16.79	19.28	35.91	20.20**
Older	*40-75K*	14.80	13.74	19.23	21.15	31.08	16.28**
	Above 75K (High)	18.72	16.54	19.73	17.73	27.28	8.56**
	Low − High	−3.01**	−4.22**	−2.94**	1.55*	8.63**	

Table VIII

Portfolio Dividend Yield Across Age and Income Groups

This table reports the average quarterly portfolio dividend yield (in percent) of groups of investors formed by sorting on age and income. The portfolio dividend yield of portfolio p at the end of month t, PDY_{pt}, is measured as

$$\text{PDY}_{pt} = \sum_{j=1}^{N_{pt}} w_{pjt}\text{DY}_{pjt},$$

where N_{pt} is the number of stocks in portfolio p at the end of month t, w_{pjt} is the weight of stock j in the portfolio at the end of month t, and DY_{pjt} is the dividend yield of stock j in the portfolio from the most recent quarter prior to month t. The annual average of PDY for the 1991-96 sample-period is reported. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in the average quarterly portfolio yields. * and ** denote significance at the 5% and 1% levels, respectively.

Investor Group	1991	1992	1993	1994	1995	1996
Age Groups						
Below 45 (Younger)	0.654	0.560	0.469	0.457	0.440	0.410
45-65	0.667	0.594	0.516	0.508	0.493	0.437
Above 65 (Older)	0.805	0.720	0.631	0.654	0.660	0.600
Older − Younger	0.151**	0.160**	0.162**	0.197**	0.220**	0.190**
Income Groups						
Below 40K (Low)	0.722	0.655	0.563	0.573	0.572	0.510
40-75K	0.694	0.611	0.530	0.533	0.530	0.494
Above 75K (High)	0.664	0.574	0.491	0.476	0.451	0.398
Low − High	0.058**	0.082**	0.072**	0.097**	0.122**	0.112**

Table IX
Dividend Preference and Risk Aversion

This table reports the sample-period average quarterly portfolio dividend yield (PDY) for investor groups formed by performing independent double sorts on age, income, and diversification variables. The portfolio dividend yield of portfolio p at the end of month t, PDY_{pt}, is measured as

$$\text{PDY}_{pt} = \sum_{j=1}^{N_{pt}} w_{pjt}\text{DY}_{pjt},$$

where N_{pt} is the number of stocks in portfolio p at the end of month t, w_{pjt} is the weight of stock j in the portfolio at the end of month t, and DY_{pjt} is the dividend yield of stock j in the portfolio from the most recent quarter prior to month t. The diversification level is measured as the sum of squared portfolio weights. It is a proxy for risk aversion. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in average quarterly portfolio yields. * and ** denote significance at the 5% and 1% levels, respectively.

	Diversification Quintiles					
Investor Group	Low	Q2	Q3	Q4	High	High−Low
Age Groups						
Below 45 (Younger)	0.366	0.386	0.414	0.433	0.448	0.081**
45-65	0.437	0.434	0.440	0.468	0.499	0.062**
Above 65 (Older)	0.617	0.611	0.595	0.600	0.618	0.001
Older − Younger	0.251**	0.226**	0.182**	0.167**	0.171**	
Income Groups						
Below 40K (Low)	0.507	0.474	0.477	0.494	0.556	0.048*
40-75K	0.415	0.441	0.444	0.481	0.505	0.090**
Above 75K (High)	0.379	0.391	0.425	0.444	0.497	0.117**
Low − High	0.128**	0.083**	0.051*	0.050**	0.059**	

Table X

Estimation Results: Household Portfolio Dividend Yield Equation

This table reports the estimates of cross-sectional regressions where the average portfolio dividend yield of a household is the dependent variable and a set of household characteristics are used as independent variables. *Income* is the total household income, *Age* is the age of the head of the household, *Diversification Level* is the average number of stocks in a household portfolio, and *Family Size* measures the number of people (children and adults) in 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 non-professional category which consists of blue-collar workers, sales and service workers, and clerical workers. *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 size of the household portfolio, and *Portfolio Performance* is the risk-adjusted performance (Sharpe Ratio) of the household. Finally, *RMRF, SMB, HML,* and *UMD* are the factor loadings from a four-factor model where the monthly household portfolio return is used to obtain these estimates. To allow for direct comparison among the coefficient estimates, variables are standardized so that each variable has a mean of 0 and a standard deviation of 1. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period.

Dependent variable: Average portfolio dividend yield (in percent) of a retail investor

	1991-93		1994-96		1991-96	
Variable	Estimate	*t*-stat	Estimate	*t*-stat	Estimate	*t*-stat
Intercept	0.001	0.05	-0.043	-0.61	-0.000	-0.02
Age	0.069	6.03	0.072	4.66	0.080	6.97
Income	-0.022	-2.28	-0.019	-2.44	-0.023	-2.50
Diversification Level	0.018	2.09	0.041	3.15	0.019	2.77
Family Size	-0.014	-1.16	0.001	0.12	-0.016	-1.05
Professional Dummy	0.010	0.86	-0.024	-1.70	0.002	0.19
Retired Dummy	0.030	2.39	0.015	1.79	0.028	2.26
TDA Dummy	0.033	3.07	0.010	1.82	0.027	2.91
Portf. Turnover	-0.031	-3.24	-0.081	-5.50	-0.032	-3.43
Portf. Size	0.040	3.78	0.023	1.85	0.034	3.20
Portf. Performance	0.044	4.69	0.028	2.59	0.041	4.44
RMRF	-0.120	-11.88	-0.141	-9.02	-0.134	-13.65
SMB	-0.473	-15.70	-0.559	-13.57	-0.474	-16.28
HML	0.392	16.10	0.439	7.27	0.401	17.55
UMD	-0.079	-7.55	-0.008	-0.51	-0.071	-5.88
Num. of households		10,353		6,158		10,457
Adjusted R^2		0.24		0.26		0.25

Table XI
Trading Behavior 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 computed as 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, in Panel B, we report the average BSIs for low dividend yield stocks (bottom quintile), and in Panel C, we report the results for high dividend yield (top quintile) stocks. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in average BSIs. * and ** denote significance at the 5% and 1% levels, respectively.

Panel A: Ex-Day Activity for All Dividend Yield Stocks

Investor Group	Pre-Event -10:-6	Pre-Event -5:-1	EventDay 0	Post-Event +1:+5	Post-Event +6:+10	Ev−Pre	Post−Pre
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 Low Dividend Yield (Bottom DY Quintile) Stocks

All Investors	-0.07	0.17	3.27	0.94	-0.36	3.09**	0.76
Age Groups							
Below 45 (Younger)	-1.25	-2.00	0.53	-4.94	-3.91	2.53**	−2.94**
45-65	1.13	0.52	-2.43	-0.87	0.66	−2.96**	−1.40
Above 65 (Older)	1.40	-1.54	1.41	-3.81	-0.36	2.95**	−2.27**
Older − Younger	2.65**	0.46	0.89	1.13	3.55**	0.42	0.67
Income Groups							
Below 40K (Low)	0.69	0.33	2.08	3.97	0.49	1.75*	3.65**
40-75K	-0.60	-1.70	-2.70	-3.87	-4.21	−1.00	−2.17**
Above 75K (High)	-1.57	-0.66	4.60	-3.85	-3.21	5.26**	−3.19**
Low − High	2.27**	0.99	−2.52**	7.82**	3.70**	−3.51**	6.84**

Panel C: 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**

Table XII
Ex-Day Premium and Retail Investor Characteristics

This table reports the estimated coefficients from pooled regressions with fixed year effects where the dependent variable is the average ex-day premium (average taken over the year) for a given stock. The ex-day premium is defined as the ratio of the ex-day price change (Cum-dividend price − Ex-dividend price) and 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, (ii) *Income*, which is the value-weighted average household income of retail stockholders of a given stock in a particular year, and (iii) *Diversification Level*, which is the value-weighted average diversification level 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 each year using the market capitalization at the end of December. The t statistics for the coefficient estimates are reported in parentheses. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period.

Panel A: Unadjusted Ex-Dividend Day Price

Dependent variable: Average Ex-day premium

		Size Quintiles				
Variable	All	Small	Q2	Q3	Q4	Large
Age	0.007	0.055	0.001	0.003	-0.006	0.005
	(1.49)	(2.24)	(0.01)	(0.13)	(-0.26)	(0.23)
Income	-0.006	-0.035	-0.020	0.016	0.003	-0.015
	(-1.45)	(-1.98)	(-0.81)	(0.65)	(0.11)	(-0.77)
Diversification Level	-0.015	0.054	-0.001	-0.025	-0.048	-0.045
	(-0.94)	(1.11)	(-0.02)	(-0.71)	(-1.03)	(-1.04)
N(stocks)	9,396	1,766	1,625	1,730	1,939	2,336
Adj. R^2	0.002	0.015	0.015	0.006	0.004	0.003

Panel B: Ex-Dividend Day Price Adjusted using CAPM

		Size Quintiles				
Variable	All	Small	Q2	Q3	Q4	Large
Age	0.009	0.062	0.003	0.017	-0.022	0.020
	(1.81)	(2.51)	(0.13)	(0.69)	(-0.96)	(0.97)
Income	-0.005	-0.050	-0.025	0.028	0.011	-0.013
	(-1.71)	(-2.04)	(-0.97)	(0.53)	(0.48)	(-0.61)
Diversification Level	-0.015	0.033	0.004	-0.030	-0.055	-0.054
	(-0.95)	(0.68)	(0.11)	(-0.84)	(-1.15)	(-1.09)
N(stocks)	9,396	1,766	1,625	1,730	1,939	2,336
Adj. R^2	0.001	0.015	0.019	0.003	0.004	0.004

Table XIII
Trading Behavior Around Dividend Announcement Events

This table reports the average excess buy-sell imbalance (BSI) of groups of retail investors 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 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 announcement date. Equal-weighted averages (average is taken 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 average BSIs for low dividend yield stocks (bottom quintile), and in Panel C, we report the results for high dividend yield (top quintile) stocks. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in average BSIs. * and ** denote significance at the 5% and 1% levels, respectively.

Panel A: Ex-Day Activity for All Dividend Yield Stocks

Investor Group	Pre-Event -10:-6	Pre-Event -5:-1	EventDay 0	Post-Event +1:+5	Post-Event +6:+10	Ev−Pre	Post−Pre
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: Ex-Day Activity for Low Dividend Yield (Bottom DY Quintile) Stocks

All Investors	-3.47	-2.48	1.94	1.77	-1.36	4.42**	4.25**
Age Groups							
Below 45 (Younger)	-5.35	-2.21	4.89	0.67	-5.01	7.10**	2.88**
45-65	-3.26	-1.98	7.00	0.57	-3.14	8.99**	2.56**
Above 65 (Older)	-3.31	1.79	4.28	6.46	-4.31	2.49**	4.67**
Older − Younger	2.04*	4.00**	−9.17**	5.79**	0.70	−4.61**	1.79*
Income Groups							
Below 40K (Low)	-6.03	-3.57	4.00	1.91	-4.73	7.57**	5.48**
40-75K	-6.37	0.16	5.72	1.89	-6.52	5.56**	1.72*
Above 75K (High)	-0.92	-2.46	5.27	4.11	2.51	7.72**	6.57**
Low − High	−5.11**	−1.12	−1.27	−2.20**	−7.25**	−0.15	−1.09

Panel C: Ex-Day Activity for High Dividend Yield (Top DY 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**

Table XIV

Retail Ownership Shifts Around Dividend Initiations and Omissions

This table reports the total and excess group ownership around dividend initiation and omission events. Investor groups are defined based on age and income. The total ownership of an investor group in a particular stock is the total weight of the stock in the aggregate group portfolio, where the aggregate group portfolio is constructed by combining the portfolios or all investors within the group. Corresponding to each event, a benchmark ownership level is also defined for each group where the benchmark ownership level is assumed to be 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 levels, columns 2-5 report the observed ownership levels, and columns 6-8 report excess ownership levels. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in average BSIs. * and ** denote significance at the 5% and 1% levels, respectively.

Panel A: Dividend Initiations

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)
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

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)
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**

Table XV
Stability of Dividend Preference

This table reports the results from a split-sample test that examines the stability of dividend preference of retail investors. For all households that are present in our sample at the end of 1993, we first compute the average dividend yield in both halves of the sample period (1991-93 and 1994-96). Households with less than 1-year of data in either of the two halves are excluded from our analysis. Then, we divide households into portfolio dividend yield (PDY) deciles by sorting on their PDY measure. The percentage of households that move from PDY decile i ($i = 1, \ldots, 10$) in the 1991-93 period to PDY decile j ($j = 1, \ldots, 10$) in the 1994-96 period are shown. The last column shows the percentage of households that stayed in first half decile or moved to one of their immediate neighboring deciles in the second half. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period.

1991-93	1994-96 PDY Decile										Percent
PDY Decile	Low	D2	D3	D4	D5	D6	D7	D8	D9	High	Stable
Low	61.27	24.35	6.07	3.11	1.70	1.05	0.90	0.51	0.58	0.47	85.62
D2	13.55	41.91	27.02	8.16	3.90	1.91	1.37	0.79	0.79	0.58	82.48
D3	8.06	13.22	26.84	28.90	11.89	4.77	2.82	1.66	1.08	0.76	68.97
D4	5.24	7.30	16.40	24.57	23.45	11.02	6.11	2.85	1.81	1.26	64.41
D5	4.01	4.73	9.32	14.85	23.09	20.23	11.81	6.25	3.47	2.24	58.16
D6	3.00	3.65	6.76	7.88	14.67	21.06	23.05	11.38	5.67	2.89	58.78
D7	2.13	2.24	2.57	5.53	8.63	14.49	24.60	24.89	10.87	4.05	63.98
D8	1.19	1.48	2.85	3.83	6.00	10.01	15.10	27.89	24.35	7.30	67.34
D9	0.90	0.72	1.34	1.95	4.62	10.80	9.61	16.76	32.88	20.41	70.05
High	0.65	0.40	0.83	1.23	2.06	4.65	4.62	7.00	18.46	60.12	78.58

Table XVI
Dividend Preference and the Disposition Effect

This table reports disposition effect (DE) measures for investor groups formed by sorting on age and income. The DE is computed for each of the five DY quintiles. The DE measure is defined as the difference of proportion of gains realized (PGR) and proportion of losses realized (PLR). PGR is the ratio of the number of gains realized and the total number of winners in a given portfolio (i.e, the total number of actual gains and paper gains). Similarly, PLR is the ratio of the number of losses realized and the total number of losers in a given portfolio (i.e, the total number of actual losses and paper losses). Therefore, a positive DE indicates that the investor is less willing to sell the losers in the portfolio relative to the winners in the portfolio. The retail investor holdings data is from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in the average DE. * and ** denote significance at the 5% and 1% levels, respectively.

	Dividend Yield (DY) Quintiles					
Investor Group	Low	Q2	Q3	Q4	High	High−Low
All Investors						
	0.043	0.030	0.026	0.035	0.029	−0.014**
Age Groups						
Below 45 (Younger)	0.085	0.068	0.060	0.075	0.059	−0.026**
45-65	0.056	0.045	0.039	0.045	0.039	−0.017**
Above 65 (Older)	0.023	0.016	0.017	0.016	0.007	−0.016**
Income Groups						
Below 40K (Low)	0.055	0.040	0.047	0.049	0.039	−0.017**
40-75K	0.058	0.052	0.041	0.048	0.038	−0.020**
Above 75K (High)	0.054	0.035	0.029	0.035	0.027	−0.027**
Diversification Groups						
Low Div	0.121	0.098	0.082	0.081	0.087	−0.034**
Medium Div	0.109	0.069	0.076	0.071	0.073	−0.036**
High Div	0.030	0.023	0.021	0.028	0.022	−0.008*

Table XVII

Cross-Sectional Variation in Dividend Preference at the Time of Purchase

This table reports the value-weighted average quarterly dividend yield of stocks purchased by different groups of retail investors formed on the basis of their age, income, and occupation. The dividend yield from the most recent quarter prior to a trade is used to compute the average yields where the weights are determined by the dollar value of the trades. The results are qualitatively similar when all trades are weighted equally. The retail investor holdings data are from a large discount brokerage house in the U.S. for the 1991-96 time-period. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights. * and ** denote significance at the 5% and 1% levels, respectively.

	1991	1992	1993	1994	1995	1996
Age Groups						
Below 45 (Younger)	0.350	0.313	0.232	0.253	0.162	0.176
45-65	0.415	0.408	0.334	0.349	0.238	0.241
Above 65 (Older)	0.581	0.580	0.448	0.491	0.332	0.375
Older − Younger	0.231**	0.266**	0.216**	0.238**	0.169**	0.200**
Income Groups						
Below 40K (Low)	0.475	0.419	0.326	0.361	0.282	0.239
40-75K	0.422	0.377	0.306	0.329	0.229	0.215
Above 75K (High)	0.410	0.375	0.303	0.330	0.232	0.228
Low − High	0.065**	0.044**	0.023*	0.032*	0.051**	0.011
Occupation Categories						
Professional	0.420	0.372	0.301	0.331	0.236	0.220
Non-Professional	0.413	0.387	0.314	0.342	0.241	0.219
Retired	0.544	0.491	0.405	0.443	0.325	0.317
Retired − Professional	0.124**	0.119**	0.104**	0.112**	0.089**	0.096**

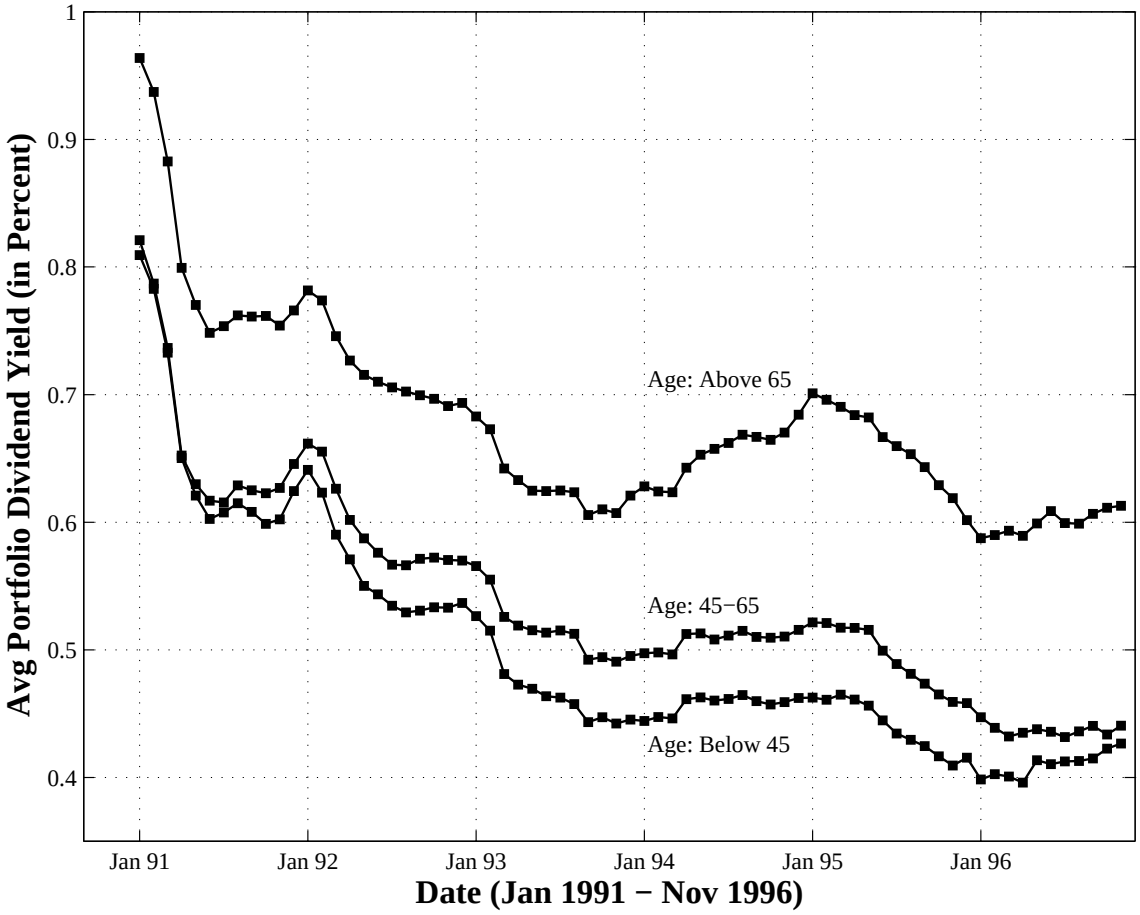

Figure 1. Dividend Preference and Age. This figure shows the time-variation in the quarterly portfolio dividend yield of three groups of investors grouped as age cohorts. The portfolio dividend yield of a given portfolio is measured as the weighted average of the dividend yields of all stocks in the portfolio. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights.

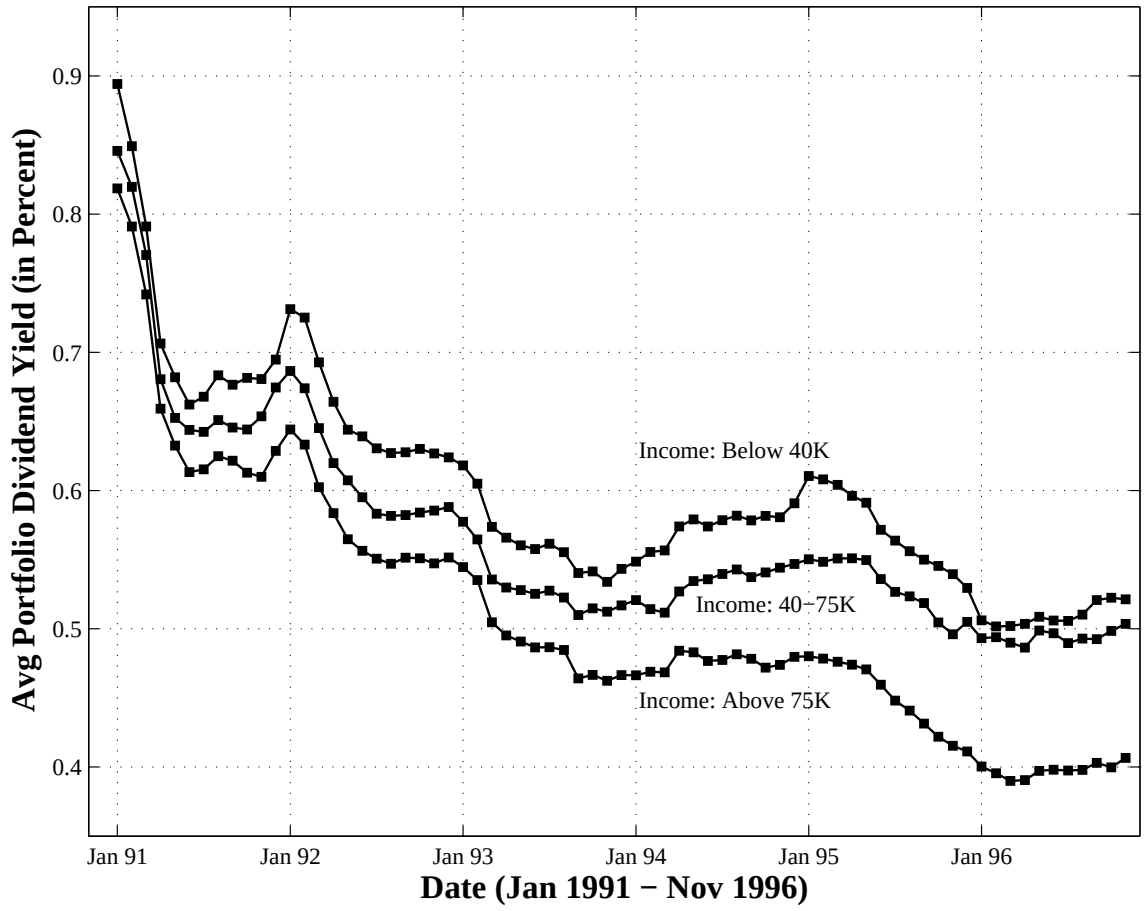

Figure 2. Dividend Preference and Income. This figure shows the time-variation in the portfolio dividend yield of three groups of investors grouped as income cohorts. The portfolio dividend yield of a given portfolio is measured as the weighted average of the dividend yields of all stocks in the portfolio. The Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights.

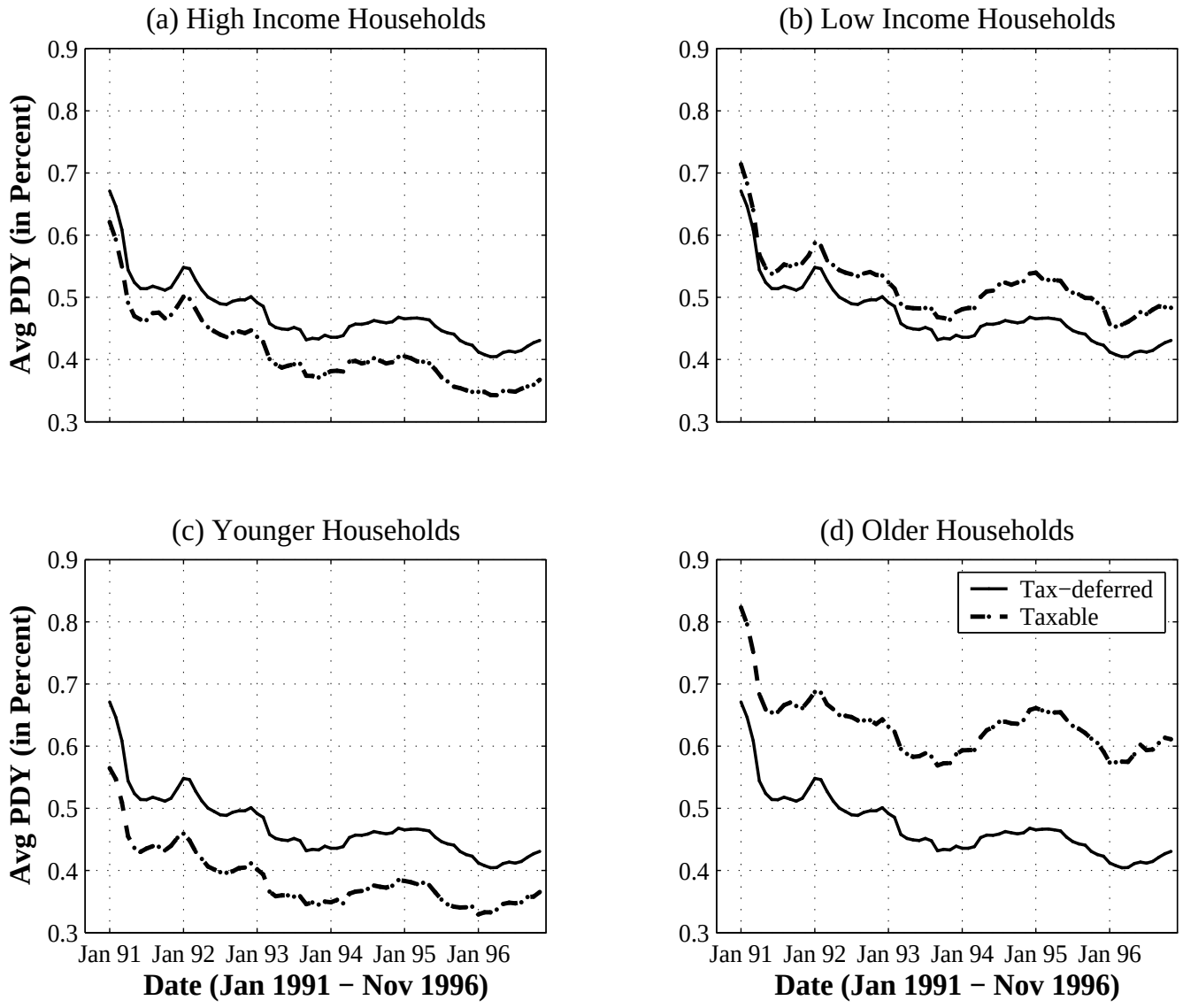

Figure 3. Dividend Preference in taxable and tax-deferred accounts. This figure shows the time-variation in the average quarterly portfolio dividend yield of investors who hold only taxable accounts or only tax-deferred accounts. Four groups of investors are examined: (a) high-income, (b) low-income, (c) younger, and (d) older. 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 Kolmogorov-Smirnov test is used to examine the statistical significance of the difference in portfolio weights.