

Do investors reinvest dividends and tender offer proceeds?

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Abstract

We find that households reinvest a very small proportion of corporate cash disbursements within two weeks, less than 1% of cash dividends and around 10% of tender offer proceeds. Tender offer proceeds are more likely to be reinvested even after controlling for the investor's identity, as well as for the size and unexpected nature of the cash flow. A dividend clientele story is consistent with some of the findings, but does not fare well under a closer look. We find that the bulk of households' reinvestment behavior is likely explained by a combination of default effects and mental accounting.

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1. Introduction

This paper studies individuals' reinvestment choices—an area that is important in two respects. First, a classical argument (Miller and Modigliani, 1961) goes that investors of listed stocks can satisfy their personal cash flow needs by selling some stock if dividends are too low, or by reinvesting part of the dividend if it is too high. Much of modern finance is based on the fact that investors are able to do this, yet there is very little evidence on whether and to what extent they actually do it. This question is connected to dividend clienteles.¹

Second, the degree of dividend reinvestment is an important factor in households' wealth accumulation. Reinvestment requires an active decision, the default choice is to do nothing. The significant impact of default choices has been shown in the context of retirement savings (Madrian and Shea, 2001; Choi et al., 2002 and 2004; Benartzi and Thaler, 2004) and merger financing (Baker, Coval, and Stein, 2006). If a default choice bias causes reinvestment of dividends from direct stock holdings to be “too low”, equity mutual funds provide an important service due to their automatic dividend reinvestment, thus increasing savings rates. Such an effect would need to be accounted for in the discussion of welfare implications of different forms of saving.

¹ The literature on dividend clientele is extensive, but evidence on their existence is mixed (see Allen and Michaely, 2004, for a review). Recent evidence from trading records supports the existence of tax and age clientele (Lee et al., 2006; Graham and Kumar, 2006).

In this paper we provide evidence bearing on these questions, documenting how investors reinvest corporate cash dividends and tender offer proceeds.² We focus on reinvestments (rather than the creation of homemade dividends through sales of stock) because the timing of dividends is unambiguously determined, it is exogenous for all except controlling shareholders, and the possible reinvestment should optimally occur immediately. More generally, corporate cash distributions are one type of a liquidity shock, and in standard theories most trading occurs in response to liquidity shocks.³

Our data contain the reinvestment action of all domestic individual and institutional investors in virtually all Finnish stocks during 1995-2002. The data allow identifying, on a daily basis, which of the investors receive dividends and tender offer proceeds and how they trade after having received these cash flows. The Finnish setting has other advantages as well. First, the strict rules of the Finnish Central Securities Depository (FCSD) and electronic transfer of funds guarantee that dividends and tender offer proceeds are paid to all investors within the same day, typically eight trading days after the ex-dividend date. As a result, the exact day that an investor has access to the funds can be identified. Second, dividends are paid only once a year rather than quarterly, which means that they are larger and transaction costs are less of an issue. Third, there are no dividend reinvestment plans in Finland, so all observed reinvestments are self-initiated. Fourth, during our sample period Finland used an imputation tax system for dividend income in which tax rates for dividends are identical for all domestic taxable investors

² The only other paper studying reinvestment behavior is the independent and contemporaneous work of Baker, Nagel, and Wurgler (2007). We later discuss the differences and similarities of the two papers.

³ The extent to which these payments are expected varies. The upcoming regular dividend is quite predictable, but special dividends and tender offer proceeds are not.

(zero in most years). Thus, unlike in countries with different tax brackets for dividend income, such as the United States, there can not be tax-based dividend clienteles among the Finnish household investors.

How much reinvestment should theoretically be expected? Aggregate net buying in a particular stock following a dividend payment must be zero by the market clearing condition. However, net buying of other stocks by the group of investors who just received a dividend in a particular stock is not constrained to be zero by market clearing. The need for reinvestment should then be related to dividend clienteles. With perfect sorting into dividend clienteles, there would be little need for reinvesting dividends, as investors are self-selected to hold stocks that provide just the level of dividends they want.

Our results show that very little of the dividends are reinvested. Reinvestment within two weeks of the payment is on average less than 1% of the dividends received by individual investors. We calculate this reinvestment ratio first for all dividend-investor pairs capping the ratio between -1 and 1, and then averaging across pairs. We calculate these results excluding very passive investors, and the majority of household investors belong to that category. Reinvestment is strictly positive in 10% of the dividend-investor observations, and in 15% of the observations when dividend payments are larger than the median lot value of stocks listed in the Helsinki Stock Exchange. Investment back to the same stock that paid the dividend is strictly positive in only 1.4% of the observations. So, while investors could adjust their dividend income, they do not engage in such activity. Institutional investors' propensity to reinvest is also low, with the exception of mutual funds.

The low reinvestment ratios for regular dividends would seem to be consistent with a non-tax based dividend clientele story: most investors hold stocks providing the right amount of

dividends, which leaves little need for reinvestment. However, we also find a low rate of reinvestment for unexpected distributions, namely tender offer proceeds and special dividends. For example, individuals reinvest only 9% of larger tender offer proceeds. Even under perfect sorting into dividend clienteles, these unexpected cash flows should optimally be fully reinvested as soon as possible. We also investigate trading in response to changes in dividend income, and we do not detect portfolio rebalancing as predicted by dividend clientele theory. These results suggest that dividend clientele effects play little role in explaining reinvestment behavior. All in all, low reinvestment of all cash flow types is consistent with the notion that default choices strongly affect behavior.

Investigating further the propensity to reinvest different types of cash flows, we find that households are significantly more likely to reinvest tender offer proceeds than both regular and special dividends. We confirm this result for investors receiving both types of cash flows matching the size of the cash flows, and in a regression controlling for investors' past trading activity and portfolio size, among other things. Tax or wealth effects are unlikely to explain the difference. The greater tendency to reinvest tender offer proceeds could be related to mental accounting. Thaler (1990, 1999) argues that money obtained from different sources is placed in different mental accounts, having different propensities to be consumed. Instead of homemade dividends and active reinvestment decisions, investors may appreciate an exogenous separation of dividend income and capital gains due to self-control reasons, and establish rules like "Do not consume out of investment capital" (Shefrin and Statman, 1984; Shefrin and Thaler, 1988). Investors may thus reinvest more tender offer proceeds than dividends because they would view them as belonging to the mental account of "capital" which they want to preserve.

Tender offering payments corresponding to a compulsory acquisition of remaining shares give additional information on default effects.⁴ These types of payments represent a small portion of all tender offer payments, and they are made to investors who are on average very passive. The reinvestment rate in these payments, unlike in other tender offer payments, is not any higher than that of regular dividends. The default course of action in a tender offering is to do nothing, as tendering requires contacting one's broker. It seems that investors who choose the default action in the tendering decision (and thus ultimately end up in a compulsory acquisition according to the Finnish rules), also choose the default action in the reinvestment decision and do nothing. It thus seems that inertia and mental accounting compete in the decision to reinvest tender offer proceeds.

Our findings are complementary to the contemporaneous work of Baker, Nagel, and Wurgler (2007), who focus on the effect of capital gains versus dividends on consumption. Consistent with Baker et al., we find that mental accounting likely plays a role in investment decisions, but we focus on the differential reinvestment of different types of corporate cash disbursements. The data on tender offers makes this possible, as well as reveals the importance of default effects. We are also able to more accurately assess possible dividend clientele effects, as we have data on all investors in a market with homogeneous taxation of household investors.

The remainder of this paper is organized as follows. The next section explains the relevant institutional details and discusses the data and sample selection. Section 3 presents the results on reinvestment activity and the determinants of reinvestment decisions. Section 4 concludes and discusses the practical implications of the findings.

⁴ The institutional environment regarding tender offers in Finland is similar to that in the United Kingdom, but different from that in the United States. We discuss the details in Section 2.3.

2. Institutional setting and data

In this section, we first review relevant institutional details of the dividend payment process, the lag between the last cum-dividend and payment date, and tender offers in Finland. We then describe the data and sample selection.

2.1. Tax issues and the dividend payment process in Finland

During the sample period Finland used an imputation tax system for dividend income, which effectively makes dividends tax-free (or close to tax-free in some years) for all domestic investors. The effective tax rate for dividends was 4% in 1996, 1.4% in 2000, and zero in 1995, 1997-1999, and 2001-2002. Capital gains were taxed at 25-29%.

Cash dividends are paid once a year, typically in March and April. Dividend reinvestment plans are rare in Finland, and no such plans were in effect during the sample period. The board of directors proposes the size of the cash dividend to the annual general meeting. The dividend proposal is announced simultaneously with the corporate earnings for the fiscal year. It is very rare for the annual general meeting to deviate from the proposal.

The electronic ownership records of the FCSD determine to whom the dividends are paid. A shareholder does not have to do anything to receive the dividend; the company transfers the funds directly to the investor's bank account. The Finnish retail payment systems are among the most sophisticated and efficient in the world (Iivarinen, 2002). Small interbank payments are settled twice a day, and the payment is often in the receiver's account on the same day.

An investor who has bought shares no later than on the last cum-dividend day ($t + 0$) is entitled to a dividend. Because of a settlement lag, ownership of shares is determined by the ownership records on the registration day, which is the third trading day after the last cum-dividend day ($t + 3$). The FCSD has strict rules for the payment of dividends; these rules

guarantee that the bank accounts of shareholders are credited on the reported dividend payment day.⁵

2.2. Lag between last cum-dividend and payment day

Compared to the United States, where dividends are paid several months after the ex-day, the lag between the ex-day and the payment day in Finland is short. Of the 916 dividend payments in the dataset, about a half were made on the fifth trading day ($t + 8$) following the registration day ($t + 3$), which is also the stock exchange norm. Only eight payments had a lag of fewer than three trading days.

Is the lag between the ex-day and the payment date long enough to avoid confusion between trades related to reinvestment of dividends and trades related to ex-day tax arbitrage? By utilizing the same data as in this study, Rantapuska (2007) shows that the majority of short-term ex-day trades are concentrated on the last cum-dividend day and the first ex-dividend day. The number of short-term trades starts to rise five days before the last cum-dividend day, and the number returns to the same level five days after the last cum-dividend day, at $t + 5$. Given the median of eight days between the last cum-dividend day and the payment day, trades related to ex-dividend day trading are unlikely to affect the analysis of reinvestment activity.

⁵ Errors in the settlement process can cause some delay in dividend payment. However, these kind of errors are rare. As an example, Nokia, the most traded stock, had approximately 25,000 shareholders when dividends for fiscal year 1996 were paid. For this dividend payment, there were 84 manual payment corrections, causing a delay to fewer than 0.4% of the shareholders.

2.3. Tender offers

The institutional environment regarding tender offers in Finland is similar to that in the United Kingdom. It differs from the United States in the following way. First, two-tier offers promising a higher return for tendering shareholders are not allowed. Second, the governing rules depend on the fraction of shares owned by the bidder. If the bidder owns less than two-thirds of the shares outstanding, the offer can be made for any number of shares at any price. If the bidder owns more than two-thirds, the bidder is obliged to make an offer for all the remaining shares. If the ownership exceeds 90%, the bidder has the right to compulsory acquisition of all remaining shares. Dissenting shareholders have a right to arbitration if they don't accept the price, after which a forced redemption can be executed.

Earlier empirical evidence from the same market (Karhunen, 2002) shows that in almost all takeovers, the bidder is successful in acquiring full control, and tendering is thus only a matter of time. Based on this evidence, payments of tender offer proceeds are assumed to be exogenous, similar to dividends. In other words, we assume that investors do not *choose* to exchange their holdings for cash, but tender because they *have to*.

After an investor has accepted a tender offer, the tendered shares remain frozen in the investor's account until the end of the offer period. After the offer period is over, the bidder executes trades via the electronic trading system and acquires control of the tendered shares. Cash from the sale of shares is available to the investor on the settlement date. Because this study

concentrates on cash disbursements that are exogenously initiated, rather than self-initiated, shares sold in the open market during the tender offer period are excluded from the analysis.⁶

2.4. Trading record data

The main data are from the Finnish Central Securities Depository (FCSD), which maintains an electronic and official register of all securities transactions in Finland for virtually all companies listed on the Helsinki Stock Exchange. The data comprise daily trading account records of all Finnish investors. The sample period is from January 1, 1995 through November 28, 2002, a period that includes both bull and bear markets. More detailed information on the data can be found in Grinblatt and Keloharju (2000).

All transactions are tagged with a unique investor identification number enabling computation of portfolio value, the position in every stock, and the value of trades for each domestic investor in the entire market on every day. Trades are aggregated at investor level by summing up the signed value of all buys and sells during the same trading day. Hence, the unit of observation is the net daily flow to the stock market by a single investor.

We group investors into the following six categories: nonfinancial firms, financial corporations, mutual funds, nonprofit organizations, households, and foreigners. Foreigners trading in the Finnish stock market have the option of registering their stockholdings in their own name or via a domestic financial institution using a nominee account. As all our analyses are at the investor level, we use data only from registered foreigners.

⁶ We make one exception, the second offer for the shares of Hartwall. In this offer, the bidder bought shares in the open market for a price that was higher than the tender offer. Because of the higher price, the majority of investors sold their shares in the open market instead of tendering.

2.5. Ancillary data

The transaction data are supplemented with dividend and stock price data obtained from the stock exchange. There are 926 dividend payments by Finnish-listed companies during the sample period. Five companies joined the FCSD electronic registry after the beginning of the sample period, and consequently investor level data is not available for ten dividend events by these companies. Our analyses thus use 916 dividend payments, and depending on the year, the data represent 97-100% of the total stock market capitalization.

In Section 3.7 we use aggregate data on households' bank deposits, and corporate cash disbursements to obtain additional insight into the investor level results. Data for monthly deposits by households are from the Bank of Finland and cover the period from January 1999 to February 2006. Monthly aggregate flows for dividends and tender offer proceeds before December 2002 are compiled from FCSD records. From December 2002 onwards, we complement the dataset by using data from the Helsinki Stock Exchange, annual reports, and *Pörssitieto*, an annual publication for listed companies.

2.6. Sample selection

Altogether, there are 8,861,622 dividend payments to domestic shareholders and registered foreigners during the sample period. We narrow down the sample as follows. First, we filter out inactive investors who did not trade at all in the calendar year during which they received a dividend. The majority (69%) of household investors belong to this category. Excluding passive investors and aggregating dividends paid to the same investor on the same trading day leaves 2,857,221 dividend payments. Second, most of the analysis in this paper is limited to investors who received both dividends and tender offer proceeds. Using this criterion, the base sample includes 843,493 dividend payments and 16,065 tender offer proceeds. In

addition to facilitating comparison between dividends and tender offers, this restriction further tilts the sample towards more active and wealthier investors.⁷ It also increases the size of the payment cash flows. For example, the mean dividend payment for household investors in the base sample is EUR 881, which is over 50% larger than the corresponding figure in an unrestricted sample. For some analyses, however, as will be noted later, we relax this restriction and go back to a larger data set.

For the sample of tender offer proceeds, we only include cash disbursements, and thus exclude stock swaps. To be included in the sample, we further require that a full cash payment was offered as an option also in the earlier stages of an offering. Altogether, there are 44 tender offers qualifying for the sample.

Panels A and B of Table 1 show descriptive statistics for the dividend payments and tender offer proceeds in the base sample.

2.7. Minimum direct investable value (MDIV)

Fixed costs of trading and minimum lot size restrictions can make reinvestment costly. We therefore construct a subsample of dividend payments and tender offer proceeds which are large enough to be invested as such. To this end, we calculate for each sample year a measure of minimum direct investable value, MDIV. This measure indicates how much cash in hand is needed in order to easily make a direct investment in a listed company. To compute the MDIV for each sample year, we first multiply lot size by close price on the first trading day of the year

⁷ Reinvestment ratios for the full investor population are closer to zero than the ones for the base sample (reported in Table 2). First, the reinvestment rate is zero by definition for the excluded passive investors (69% of household investors and 42% of institutions). Second, investors who did trade, but did not receive both types of cash flows (also excluded from the base sample), are probably less active in general than the ones in the base sample.

for all listed shares. We then use the median of these values at the beginning of the year. The MDIV has a median of EUR 1,724 and varies from EUR 900 to EUR 3,835.

Descriptive statistics for the sample of dividends and tender offer proceeds exceeding the MDIV are reported in Panels C and D of Table 1. Comparing the number of observations in Panels A and C shows that most dividend payments are smaller than the MDIV. This is particularly prominent for household investors, for whom only 8.7% of the dividends exceed the MDIV. Comparing panels B and D shows that, due to their larger size, tender offer proceeds are less affected by the MDIV restriction. About two thirds of tender offer payments to households exceed the MDIV.

3. Results

In this section we first discuss the measurement of reinvestment and then present results for univariate analysis, proceeding to multivariate analysis.

3.1. Measuring reinvestment

The reinvestment ratio of each investor is calculated as the value of net purchases divided by the dividend proceeds. We use both 1-day and 10-day time windows to count the purchases. As will be shown in Section 3.4, the link between corporate cash disbursements and investor trading fades away after ten days.

We compute two winsorized reinvestment ratios.⁸ In the first version we winsorize the ratios at zero and one. Hence, a negative net investment in the stock market after a corporate cash disbursement is considered as a zero reinvestment. Grinblatt and Keloharju (2004) use the same limits in measuring repurchase activity. However, converting negative values to zeros obviously causes an upward bias. It also makes the reinvestment ratio positively related to the degree of trading activity. Both factors must be accounted for when interpreting the results.

The second version is a symmetric reinvestment ratio, calculated by winsorizing at -1 and 1 . If, on aggregate, there is little net reinvestment by a given investor category, the second ratio will reflect this by being close to zero. This measure does not suffer from the bias caused by differences in trading activity.

As a third measure of reinvestment activity, we calculate the proportion of observations with positive reinvestment. I.e., we take the number of observations in which the investor's net flow to the stock market is strictly positive, and divide this by the total number of investor-level observations. This measure is again correlated with trading activity, and it does not consider the reinvested amounts. The advantage is that there is no need to impose any limits, as in the case of the reinvestment ratios.

The proportion of positive reinvestment is calculated separately for cases of net flow to the entire stock market, and net flow back to the stock that paid the dividend. The reinvestment ratios, however, are calculated only for net flow to the entire stock market.

⁸ The reinvestment ratio varies considerably, making extreme values challenging to interpret. For example, if an investor receives a dividend of EUR 10 and subsequently invests EUR 50,000, the raw (unwinsorized) reinvestment ratio would be 5,000%.

Dividend payments can be clustered in time. This causes no problems for the 1-day figures, but in the case of a 10-day time window it causes dependence in the observations. We proceed as follows to account for clustering in calculating the 10-day ratios. We aggregate all dividends or tender offer proceeds which are paid within ten trading days of one another and received by the same investor. We determine the reinvestment period as starting on the day of the last dividend payment and as ending on the tenth trading day following the last payment. For example, if an investor receives a dividend on trading days t , $t + 6$, $t + 12$, and $t + 54$, this results in two observations: dividends paid on days t , $t + 6$, and $t + 12$ are aggregated into a single observation, and the reinvestment period is assumed to run from trading day $t + 12$ to trading day $t + 22$. Correspondingly, the dividend on day $t + 54$ is treated as a single observation with a reinvestment period from $t + 54$ to $t + 64$.⁹

If a payment of tender offer proceeds enters the dividend clustering or reinvestment period (or vice versa) of an investor, both observations are excluded from the sample. Similarly, in the 1-day specification, we exclude all observations in which both types of cash flows are paid to the same investor on the same trading day.

3.2. Results for unconditional reinvestment measures

Panel A in Table 2 shows that the average reinvestment ratios are very low. With a 10-day reinvestment window and a reinvestment ratio of $[-1, 1]$, the reinvestment ratio is *negative* for households and all institution types except for mutual funds. The point estimate for households climbs to only 4.4% when we use the more aggressive measure $[0, 1]$. Mutual funds

⁹ Alternatively, the 10-day reinvestment period can be assumed to start at the first dividend payment within a cluster. The results are qualitatively insensitive to the method of aggregation.

have the highest propensity to reinvest, and depending on the measure, they reinvest up to 39% of dividends within two weeks of payment. While this finding may be driven by small sample size, it seems plausible that mutual funds would want to keep their cash position at a certain level and promptly reinvest excess funds. Unreported results show that reinvestment ratios for the same stock that paid the dividend, instead of the entire market, are very close to zero.

Panel A of Table 2 also shows that the propensity to reinvest is greater for tender offer proceeds than for cash dividends. This finding is especially pronounced for households and nonprofit organizations. However, this analysis does not account for the fact that most dividends are too small to be reinvested. Next, we investigate how much the small size of most dividends contributes to the reinvestment ratios.

Minimum lot size requirements and transaction costs make it difficult for investors to reinvest very small dividends. In the base sample, 88% of the dividends paid to domestic households were smaller than EUR 1,000. To investigate whether the reinvestment ratios differ for payments that are sufficiently large to be reinvested as such, we exclude payments that are smaller than the MDIV (see definition in Section 2.7).

Panel B in Table 2 reports results for cash disbursements greater than the MDIV. Reinvestment ratios are still low, but generally higher than the base sample averages. Looking at the 10-day reinvestment window and a reinvestment ratio in range $[-1, 1]$, the ratio is 0.5% for households, while it was negative in the base sample. Except for mutual funds, institutions still have negative ratios. Other institutions thus supply stock to meet the mutual funds' reinvestment demand. All investor types except mutual funds have higher reinvestment ratios for tender offer proceeds compared to dividends. This analysis corroborates that households have a very low

propensity to reinvest dividends in general, while the propensity is somewhat higher for larger dividends.

Table 3 shows the proportion of positive reinvestment decisions, considering disbursements greater than the MDIV. Symmetric reinvestment ratios for the same stock that paid the dividend would be very close to zero because of market clearing even if many investors adjusted their dividend income by reinvesting, and others by selling. However, the results in Table 3 show this is not the case: only 1.4% of households make a reinvestment in the same stock within ten days. These proportions are also very low (under 4%) for institutions, except for financial corporations (10%) and mutual funds (15%). Considering reinvestment to the entire market, households make reinvestments in about 15% of the cases for regular as well as special dividends, and in 20% of the cases for tender offers. These proportions are high for financial institutions reflecting their high trading activity.

3.3. Reinvestment of dividends versus tender offer proceeds

In the previous section we considered distributions that are large enough to be reinvested, but the reinvestment ratios for different types of cash flows could still be affected by systematic differences in the sizes of the cash flows. For example, tender offer proceeds tend to be much larger than dividend payments. In this section we compare cash flows of the same size, but of different type, paid to the same investor.

We first construct a value-matched sample of dividends and tender offer proceeds. For each payment of tender offer proceeds, we pick a dividend paid to the same investor with the closest total value, but requiring that the dividend payment be at least 50% of the tender offer proceeds. Observations not meeting this criterion are discarded. In addition to the 50% cutoff, we

experiment with alternative cutoff values, and the results are insensitive to any reasonable changes.

We then compare the reinvestment ratios for the different cash flow types using Wilcoxon's signed rank test to account for the non-normal distribution of reinvestment ratios. We pool all investors, except domestic households, into a single group labeled *institutions*, and perform the signed rank test separately for ordinary and special dividends. We calculate the results for the symmetric measure $[-1, 1]$ using 10-day investment periods.

The results are presented in Table 4. Panel A of the table shows that households' propensity to reinvest tender offer proceeds is greater than that of dividends. There is similar evidence also for institutions. In the case of institutions, charter rules are a possible cause of this result. For example, foundations and endowments often have rules forcing expenses and donations to be covered by dividends rather than proceeds from the sale of securities. However, one should be cautious in drawing conclusions based on this relatively small subsample consisting of various types of institutions.

We perform the same test for special dividends versus tender offer proceeds. Companies sometimes pay special dividends in addition to the regular annual dividend, for example in response to the accumulation of excess cash from asset sales. Special dividends are rather rare: in our sample of 916 dividend events, there are only 11 special dividends. Special dividends are typically much larger than regular dividends, however. Special dividends are thus similar to tender offer proceeds in three respects: they are rare, unexpected, and result in a large flow to investors.

Panel B of Table 4 presents the results for size-matched reinvestment rates for tender offer proceeds versus special dividends. The majority of investors have higher reinvestment rates

for tender offer proceeds. This is true for both individuals and institutions, but the small sample size may be an issue for institutions. In 56.5% of the cases, individual investors make no reinvestment after either type of cash flow. In 24.0% of the cases the reinvestment ratio is higher after tender offer proceeds, and in 19.6% of the cases it is higher after special dividends. The higher propensity to reinvest tender offer proceeds could be due to mental accounting: If investors perceive tender offer proceeds to be part of the investment capital, and special dividends to be income, they may be more inclined to reinvest the former.

To check for the effect of time variation we re-estimate the results by requiring that the matched dividend was paid in the year of the tender offer. We are able to perform this analysis only for the case of tender offers versus matched regular dividends because of sample size limitations. The results are qualitatively the same.

3.4. A dynamic approach

This subsection investigates the timing of reinvestment decisions in response to current and past cash flows shocks. Trading decisions around dividend and tender offer proceeds payments are modeled with the following autoregressive distributed lag (ARDL) specification:

$$y_{i,t} = \alpha_i + \sum_{n=0}^{20} \beta_n D_{i,t-n} + \sum_{m=1}^6 \delta_m H_m + \varepsilon_{i,t} \quad (1)$$

In the equation above, $y_{i,t}$ indicates the direction of the net trades (−1 for net sales, 0 for no trade, and 1 for net buys) by investor i on day t and $D_{i,t-n}$ is the log of dividends or tender offer proceeds on the same day ($n = 0$) and preceding days ($n = 1, 2, \dots, 20$). The equation is estimated using ordinary least squares and includes investor fixed effects, α_i , and six year

dummies, H_m .¹⁰ The regression is run only for those $\{i, t\}$ where $\sum_{n=0}^{20} D_{i,t-n} \geq MDIV$ (see definition in Section 2.7), i.e., we model trading decisions conditional on receiving cash at least in the amount of MDIV during the past 20 trading days. Unlike the previous analyses, here we do not restrict to investors receiving both types of cash flows. The resulting larger sample size increases precision for estimating 20 coefficients, while the investor fixed effects should pick up possible differences in the trading activity between those who do, and those who do not receive any tender offer proceeds.

Table 5 shows the results, and the estimated coefficients are graphed in Figure 1. The decay of coefficients suggests that the 10-day period used in the earlier analysis is long enough to capture the impact of a cash disbursement on trading. Household investors who reinvest corporate cash disbursements do so relatively quickly, although not immediately: both dividend and tender offer proceeds coefficients peak on the day following the cash disbursement. The cash disbursement coefficient is no longer significantly positive at day three for dividends and at day seven for tender offer proceeds.

3.5. What drives the decision to reinvest?

In this subsection we measure the propensity to reinvest different types of cash flows while simultaneously controlling for factors such as size of the cash flow, portfolio size, past

¹⁰ We only consider the sign of net investment because using continuous variables causes estimation problems due to large variation and extreme values. This is analogous to Hasbrouck (1991). The results remain qualitatively unchanged using an ordered probit without fixed effects. An ordered probit with fixed effects is not estimable for reasons discussed in Greene (2004).

market returns, and investors' past trading activity. We run ordered logit regressions in which the dependent variable is formed by categorizing the value of net purchases as positive, zero, or negative. As an alternative specification, we run a buy/sell logit regression (coding buy as 1, sell as 0) in which we exclude observations with no trading activity. We measure the net purchases of stocks over the payment day and the 10 subsequent trading days, and aggregate all dividend payments and tender offer proceeds clustered within 10 days. We exclude observations where the string of payments extends beyond 10 days and discard cash disbursements smaller than the MDIV (see Section 2.7). Similar to the analysis in the previous section, we use an extended sample without limiting to those investors who receive both types of cash flows.

The explanatory variables in the regression comprise cash disbursement and control variables. Cash disbursement variables are a dummy for all tender offer disbursements, a dummy for later tendering stages corresponding to compulsory acquisition of remaining shares (see Section 2.3), and a dummy for special dividends. The omitted category is regular dividend payments.

To control for each investor's trading style, perhaps driven by personal liquidity needs or return expectations, we include a set of dummies measuring the investor's buying and selling activity. The dummies indicate whether the investor has made a certain number of buys and sells over the past 250 trading days. We divide the number of buys and sells into three categories (1, 2 to 5, and 6 or more), and include these dummies separately for buys and sells for a total of six dummy variables. Other control variables are the log of cash flow size, 11 past market return variables with intervals defined as in Grinblatt and Keloharju (2001), dummies for portfolio quintiles except one, calendar time since the start of the sample and its squared value.

Table 6 shows the results. Households are significantly more likely to reinvest tender offer proceeds than regular and special dividends. This is evident in both buy-nothing-sell regressions (ordered logit) as well as buy-sell regressions (logit). Baker et al. (2007) find that large special dividends are more likely to be reinvested compared to regular dividends. We find supportive evidence of this in some specifications. A Wald test for the equality of the tender offer dummy and the special dividend dummy is still overwhelmingly rejected in these specifications. Special dividends are usually larger than regular dividends, and the marginal effect of size on reinvestment is picked up by the cash flow size variable. Unreported results show that limiting to larger cash flows erodes the significance of special dividends.

A higher rate of reinvestment for tender offers is consistent with dividend clienteles because regular dividends are highly predictable, but tender offer cash flows are not. But this logic should apply to special dividends as well: even under perfect sorting into dividend clienteles, these unexpected cash flows should optimally be fully reinvested as soon as possible. The fact that we find tender offer proceeds to be significantly more likely reinvested compared to special dividends shows that appealing to dividend clienteles is not a complete explanation.

Looking at the effect of later tender offer stages allows us to gain further insight into default effects. In a decision to tender, the path of least resistance is to do nothing. In order to tender, one would need to take action and instruct one's broker to sell the shares. Evidence from the same market by Karhunen (2002) shows that less sophisticated and more passive investors are more likely to hold onto their shares and not to tender until a forced redemption. These later stage tendering disbursements represent only 13.3% of the observations in our data.

A plausible hypothesis is that investors making the default choice in the tendering decision (not to tender until they have to) are also more likely to make the default choice in the

reinvestment decision (not to reinvest). In line with this hypothesis, the dummy for compulsory acquisition shows a significantly negative marginal effect on reinvestment. The magnitude of the negative effect is somewhat less than the general positive effect of tendering, but a Wald test for the equality of the tender offer and compulsory acquisition dummies is not rejected at 5% level. Thus there is no evidence that these later stage payments would be any more likely to be reinvested than regular dividends.

Finally, we investigate possible wealth effects in unreported results. If there are wealth effects, investors should reinvest a larger fraction of the tender offer proceeds when a tender offer is made at a significant premium. The results show, however, that the coefficient for the past return of the investor's portfolio is close to zero. Neither does a variable for tender offer premium show up as significant. That wealth effects are of minor importance for stock market gains is consistent with Poterba (2000).

In sum, the findings in this section give additional evidence on households being more likely to reinvest tender offer proceeds than regular or special dividends, even when controlling for a host of factors. This may be due to mental accounting: investors label corporate cash disbursement as dividends and principal, and tend to save what they consider to be principal.

3.6. Further evidence on dividend clienteles

Earlier we have shown that the propensity to reinvest tender offer proceeds is significantly higher than that of special dividends. This difference cannot be explained by dividend clientele theory if both types of disbursements are unexpected. In this subsection we further investigate the dividend clientele hypothesis, and analyze how investors react to changes in dividend income.

An investor who consumes a constant proportion of wealth (as in Merton, 1971) must react to changes in the portfolio dividend yield. Accordingly, we measure investors' net flow to the stock market as a function of the change in the dividend yield of their portfolio. This analysis is carried out for a random sample of investors, as well as a sample of investors who have experienced the most dramatic negative shock in their dividend income, namely investors whose portfolio dividend yield has fallen to zero.

Figure 2 shows the net flow to the stock market in a second year plotted against the change in dividend income between two successive years. Both variables are normalized by the investor's portfolio value. We exclude investors who have made a complete exit from the stock market in the second year, and we again restrict the analysis to households with dividends larger than the MDIV in the first year. Panel A of Figure 2 shows the results for the sample of investors whose dividend yield goes to zero, and Panel B shows corresponding results for a random sample of households.

The fitted regression lines between relative dividend change in the investor's portfolio and net flow to the stock market in Figure 2 should have a slope of unity if the households compensate the changes in dividend income one for one, i.e., by trading an offsetting value of stock in the second year. In both Panel A and Panel B, the fitted regression line is nearly flat. The slope is -0.0236 in Panel A, and -0.0373 in Panel B. Thus, not even households that have experienced the sharpest fall in their dividend income are creating home-made dividends by selling stocks.

In sum, we find no evidence of investors reacting to changes in the dividend yield of their portfolios. Although dividend clientele effects do not show up here, it is nevertheless possible that they do show up in other contexts and explain why tender offer proceeds are reinvested more

than regular dividends. These findings, however, cast some doubt on that explanation, which, in any case, only applies to regular dividends versus tender offers, but not to special dividends versus tender offers.

3.7. Where do the dividends end up?

Investigating how aggregate bank deposit balances respond to dividends received by the household sector allows us to infer whether the dividends are consumed, or just left in the bank accounts.

We regress the monthly aggregate change in deposits by domestic households on the contemporaneous aggregate dividends and tender offer proceeds for households. As explanatory variables we include cash flow variables and time controls. Wealth tax is levied based on taxable portfolio value at the end of December, so dummies are included for December (when money is expected to flow from taxable assets such as mutual funds to tax-exempt deposits) and January (when money is expected to return to taxable assets).

Table 7 shows the results. In Specification 1 the point estimate for dividends is 0.81 and not significantly different from unity at the 5% level. Specification 2 reports results including lagged values of the cash flow variables and the dependent variable. The results (not reported) are qualitatively similar if lagged dividends for up to six months are included in the regression. Most importantly, the sum of the contemporaneous and lagged dividend coefficients never falls below 0.74. While the inevitable noise associated with the use of aggregate data calls for caution, the evidence is nevertheless consistent with the idea that dividends largely remain in investors' bank accounts, at least for the short term.

In all specifications, the coefficient for tender offer proceeds is close to zero, though not significantly different from unity. Aggregate tender offer proceeds are much smaller than

aggregate dividends, which makes the precision of the estimated tender offer coefficient too low to allow reliable inference.

None of the time series indicate nonstationarity in an augmented Dickey-Fuller test ($p < 0.001$), but we nevertheless also re-estimate the model by using first differences. The results are similar.

4. Conclusion

We find that households reinvest only a very small fraction of dividends in the stock market. Institutional investors do not reinvest much either, with the exception of mutual funds. We estimate that households probably reinvest less than 1% of dividends within two weeks of the payment. Even with a very aggressive measure, households reinvest only 8.1% of the dividends. These figures do not include the most passive investors, which would further bring down the estimated reinvestment ratios.

On the surface it might appear that the results are evidence of non-tax based dividend clienteles: most investors hold stocks providing the right amount of dividends, which leaves little need for reinvestment. However, we also find a low rate of reinvestment for special dividends and tender offer proceeds. Even under perfect sorting into dividend clienteles, these unexpected distributions should optimally be fully reinvested as soon as possible. Furthermore, we show that households with extreme dividend declines are not creating home-made dividends by selling stocks. This indicates that rational dividend clienteles are unlikely to be a major explanation to the small degree of dividend reinvestment.

Household investors' propensity to reinvest tender offer proceeds is significantly higher than that of regular dividends, and, importantly, also significantly higher than that of unexpected

special dividends. This holds when we account for the size of the cash flow, individual's trading style, and portfolio size, as well as carry the analysis at the level of each investor. This result is consistent with mental accounting: People segregate dividends and capital assets into different mental accounts, and are more likely to reinvest tender offer proceeds that belong to the capital asset account. This may be an example in which the labeling of cash flows can influence investor behavior (e.g., Thaler, 1999).

Based on the results of this paper as well as complementary evidence (Dong, Robinson, and Veld, 2005; Baker, Nagel, and Wurgler, 2007), a strong influence of default choices on behavior is consistent with the overall picture. When the bank account of an investor is credited, reinvesting the funds requires a self-initiated action, and not reinvesting is the default choice. Our investigation of the later stage tender offerings provides further evidence for the impact of default choices. It seems, in simplified terms, that inertia determines reinvestment behavior, unless mental accounting prompts the investor to act.

Our findings also have practical implications. First, individuals who are willing to increase saving, could consider an agreement with their stockbroker to reinvest dividends promptly, or choose a managed fund with automatic reinvestment. Benartzi and Thaler (2004) argue that due to self-control problems, it is often optimal for an individual's long-term welfare to make pre-commitments for saving. Second, when financial instruments are marketed to retail investors, it may make a difference whether a certain cash flow is labeled as a return of principal, rather than interest or dividend. Third, knowledge of reinvestment behavior also helps to make more realistic forecasts of investors' long-term wealth accumulation. For example, a reinvestment rate of 20%, which is much higher than what we find, and a dividend yield of 3% would produce a lag of 2.4% for wealth accumulation compared to a total return market index.

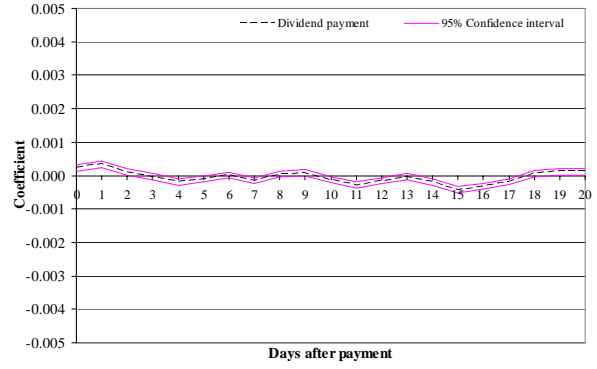
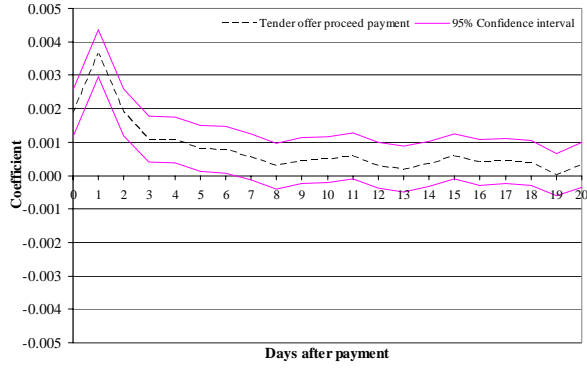
This drag on returns could thus be higher, or at least comparable to the return loss due to bad market timing, which Dichev (2007) estimates as 1.5% internationally.

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Panel A: Households



Panel B: Institutions

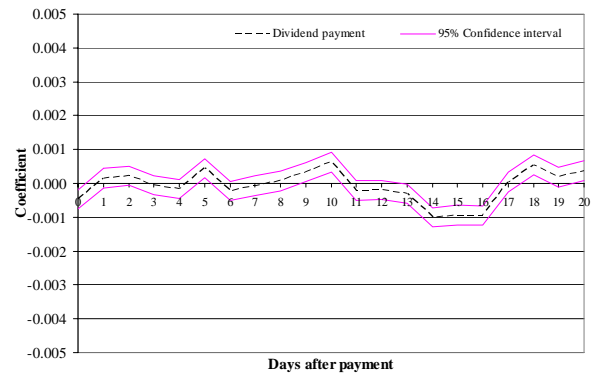
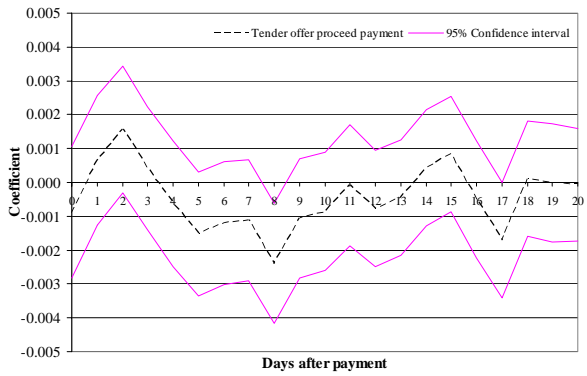
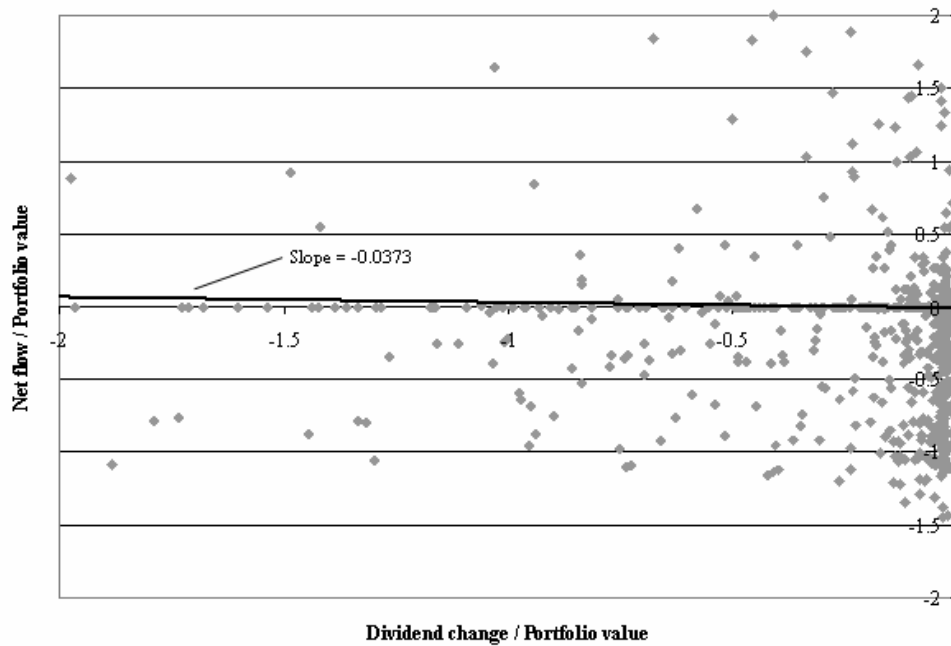


Figure 1. Net flow to the stock market on days 0 to 20 (plotting the cash disbursement coefficients from Table 5). The graphs on the left hand side show tender offer payments, and the right hand side shows dividend payments.

Panel A: Households with dividend decline to zero



Panel B: Random sample of households

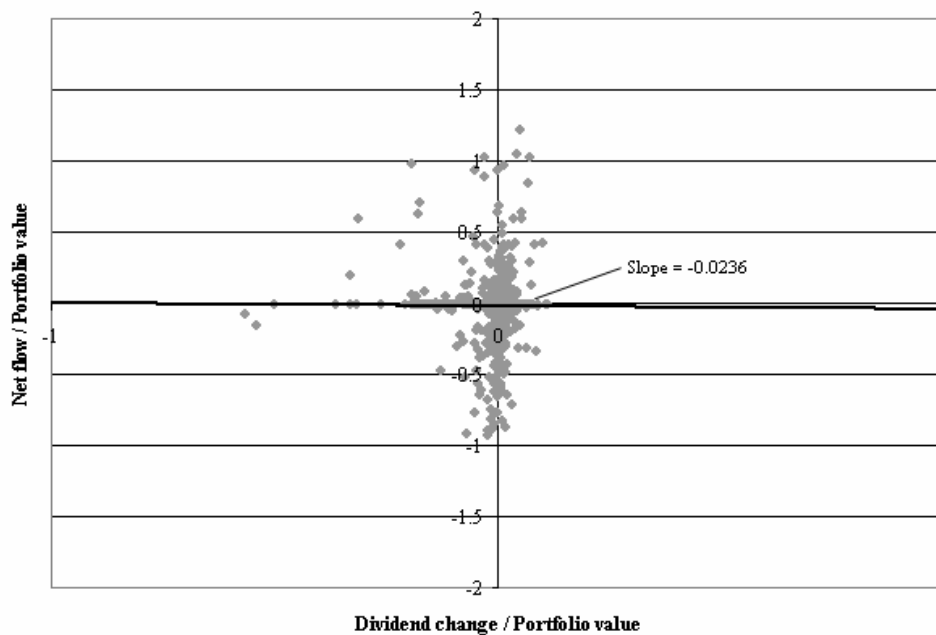


Figure 2. Scatterplot of annual net flows and dividend changes. Panel A plots the relation between annual net flows (Gross value of buys – Gross value of sells) and dividend changes for household investors whose dividend income in the year of observation has gone down to zero from an amount greater than MDIV (see Section 2.7), in the previous year. In Panel B, the same graph is plotted for a random sample of households with dividends greater than MDIV in year one. Furthermore, in both graphs it is required that the investor has not liquidated her entire portfolio in year two. Portfolio values are computed at the beginning of the second year. The sample size for both Panel A and Panel B is 932 (initially 970) after excluding 1% outlier observations at both ends for both variables. The slope of the fitted regression line is -0.0236 in Panel A and -0.0373 in Panel B. In both cases they are statistically insignificant at conventional levels.

Table 1

Descriptive statistics for dividends and tender offer proceeds in the base sample

The distribution of dividend and tender offer proceed payments is shown for the main sample (investors who received both types of cash flows, and execute at least one trade during the year of the cash flow). *Minimum*, *maximum*, *mean*, and *median* values are in EUR. Statistics for the category *foreigner* are based on registered foreigners only. MDIV is a measure of the minimum amount of cash required to make a direct investment in the stock market (defined in Section 2.7). The sample period is from 1/1995 to 11/2002.

Investor category	Minimum	Maximum	Mean	Median	Std. deviation	<i>N</i>
Panel A. Dividend proceeds						
Nonfinancial corporation	0.01	35,409,340	14,944	375	320,555	59,998
Financial corporation	0.07	54,010,400	127,859	6,300	1,238,939	15,451
Mutual fund	2.69	668,800	21,432	8,400	43,161	3,998
Nonprofit organization	0.08	155,531,100	75,622	2,518	1,438,976	48,293
Household	0.01	3,005,000	881	130	10,200	709,689
Foreigner	0.07	3,777,840	13,244	355	110,019	6,064
Total						843,493
Panel B. Tender offer proceeds						
Nonfinancial corporation	743	57,285,890	221,593	8,630	2,653,473	1,284
Financial corporation	798	49,962,780	996,376	45,000	4,243,219	351
Mutual fund	7 381	4,647,600	630,888	240,000	1,021,478	51
Nonprofit organization	978	75,946,608	775,405	43,578	4,733,032	637
Household	707	41,207,501	22,648	4,326	479,237	13,621
Foreigner	956	8,005,275	248,189	15,501	910,434	121
Total						16,065
Panel C. Dividend proceeds exceeding MDIV						
Nonfinancial corporation	900	35,409,340	55,789	4,700	624,412	15,721
Financial corporation	900	54,010,400	196,527	22,500	1,535,640	9,999
Mutual fund	931	668,800	25,848	11,518	46,389	3,292
Nonprofit organization	900	155,531,100	127,692	7,653	1,875,878	28,359
Household	900	3,005,000	7,193	2,775	33,369	61,787
Foreigner	900	3,777,840	49,711	5,298	211,158	1,583
Total						120,741
Panel D. Tender offer proceeds exceeding MDIV						
Nonfinancial corporation	1 001	57,285,890	273,789	12,834	2,954,805	1,034
Financial corporation	976	49,962,780	1,028,518	50,133	4,307,676	340
Mutual fund	7 381	4,647,600	630,888	240,000	1,021,478	51
Nonprofit organization	1 127	75,946,608	800,106	46,178	4,807,229	617
Household	906	41,207,501	31,199	5,738	581,688	9,239
Foreigner	1 198	8,005,275	282,813	19,951	968,266	106
Total						11,387

Table 2
Unconditional reinvestment ratios

Reinvestment ratios are shown for all investors in the sample who received both dividends and proceeds from tender offers. The reinvestment ratio is defined as Net flow to the stock market/Value of corporate cash disbursement. In the leftmost columns, the reinvestment ratio has a range of [0, 1], and a value of 0 (1) is assigned if the ratio is below (above) zero (one). Correspondingly, the ratio has a range of [-1, 1] in the rightmost columns. Reinvestment ratios are calculated by first computing the average reinvestment ratio for each investor and then averaging over each investor category. The 10-day reinvestment ratio is calculated by aggregating to a single observation all cash disbursements of the same type clustered within ten days of one another. When cash disbursements are aggregated, net flow to the stock market for the subsequent ten days is calculated from the day of the last dividend payment to the 10th day after the last dividend payment. The MDIV is defined in Section 2.7, and corresponds to the minimum value of funds required to make a direct investment in the stock market. *N* is the number of investors over which the reinvestment ratio is calculated, and it can vary slightly between the 1-day and 10-day windows due to sample selection restrictions. The sample period is from 1/1995 to 11/2002.

Period	Reinvestment ratio range [0, 1]						Reinvestment ratio range [-1, 1]					
	Payment day			Payment day + 10 days			Payment day			Payment day + 10 days		
	Div	Tender	<i>N</i>	Div	Tender	<i>N</i>	Div	Tender	<i>N</i>	Div	Tender	<i>N</i>
Panel A: All dividends and tender offers												
Nonfinancial corporation	0.015	0.037	1,288	0.070	0.163	1,285	0.055	0.013	1,288	-0.033	0.079	1,285
Financial corporation	0.048	0.114	131	0.123	0.217	131	-0.005	0.009	131	-0.036	-0.078	131
Mutual fund	0.084	0.152	26	0.375	0.349	26	-0.059	0.012	26	0.133	0.112	26
Nonprofit organization	0.011	0.044	566	0.040	0.122	566	-0.001	0.007	566	-0.040	0.013	566
Household	0.007	0.020	20,201	0.044	0.129	20,174	-0.001	0.011	20,201	-0.020	0.083	20,174
Foreigner	0.008	0.014	150	0.043	0.138	149	0.016	-0.006	150	-0.030	0.079	149
Panel B: Dividends and tender offers greater than MDIV												
Nonfinancial corporation	0.035	0.032	738	0.118	0.156	837	-0.001	0.012	738	-0.023	0.053	837
Financial corporation	0.077	0.098	103	0.144	0.255	102	-0.004	0.021	103	-0.042	-0.023	102
Mutual fund	0.187	0.152	26	0.388	0.349	26	0.035	0.012	26	0.157	0.112	26
Nonprofit organization	0.022	0.030	485	0.066	0.131	494	0.003	0.009	485	-0.020	0.025	494
Household	0.017	0.014	7,309	0.081	0.132	9,010	0.003	0.009	7,309	0.005	0.091	9,010
Foreigner	0.012	0.008	82	0.059	0.143	89	-0.003	-0.009	82	-0.037	0.082	89

Table 3

Proportion of positive reinvestment decisions for larger cash flows

Relative share of cases where reinvestment was strictly positive (number of observations where the investor's net flow to the stock market or the single stock was strictly positive, divided by the total number of observations). The sample of investors comprise those who received both dividends and proceeds from tender offers. Only cases in which the cash flow was greater than MDIV are considered (see Section 2.7 for a definition). The 10-day figures are calculated by aggregating to a single observation all cash disbursements of the same type clustered within ten days of one another. When cash disbursements are aggregated, the 10-day reinvestment period is calculated from the day of the last dividend payment to the 10th day after the last dividend payment. The sample period is from 1/1995 to 11/2002.

Investor category		Reinvestment in the same stock	Reinvestment in the entire market		
		Dividend	Dividend	Special dividend	Tender offer
Nonfinancial corporation	1 day	0.8 %	8.8 %	6.0 %	6.2 %
	10 days	3.9 %	23.8 %	25.5 %	22.6 %
	<i>N</i>	37,566	31,703	1,653	1,356
Financial corporation	1 day	2.8 %	22.9 %	16.9 %	28.2 %
	10 days	10.4 %	39.2 %	48.9 %	38.7 %
	<i>N</i>	13,520	8,851	272	266
Mutual fund	1 day	2.7 %	32.3 %	30.4 %	24.0 %
	10 days	15.2 %	51.2 %	58.0 %	46.0 %
	<i>N</i>	5,087	3,502	112	50
Nonprofit	1 day	0.5 %	8.8 %	4.5 %	6.3 %
	10 days	3.8 %	20.6 %	16.4 %	20.2 %
	<i>N</i>	41,844	30,636	1,520	742
Household	1 day	0.2 %	2.9 %	2.6 %	3.4 %
	10 days	1.4 %	14.5 %	14.8 %	19.8 %
	<i>N</i>	182,526	166,582	14,084	15,865
Foreigner	1 day	0.9 %	21.5 %	13.4 %	4.2 %
	10 days	3.8 %	28.1 %	28.4 %	23.6 %
	<i>N</i>	3,570	4,365	201	144

Table 4

Test for the equality of investor-specific reinvestment ratios between tender offer proceeds and dividends

Wilcoxon's signed rank test Z-values for the difference in reinvestment ratios of tender offer proceed payments and (special) dividends using a 10-day reinvestment period. The null hypothesis for the test is that median of $reinvestment\ ratio_{tender} - reinvestment\ ratio_{dividend}$ in the matched sample equals zero. Reinvestment ratio definitions are as in Table 2. All tender offer proceeds must be greater than the MDIV (see Section 2.7) and they are value-matched with the (extra) dividend paid to the same investor. The value of the matched dividend must also be at least 50% of that of the corresponding tender offer proceeds. All investors, other than domestic households, are aggregated to a single group labeled *institutions*. Z-value is the Wilcoxon's test statistic, *tender offer > dividend* (*dividend > tender offer*) number of cases when the reinvestment ratio is greater for tender offer (dividend), and N is the total number of observations in the sample. *Median dividend* and *median tender offer proceeds* are matched sample median cash flow values. *Dividend > tender, % of cases* corresponds to the percentage of cases in which the matched-pair dividend is greater than the tender offer proceeds. Asterisks mark the statistical significance levels (** for 5% and *** for 1%, respectively). The sample period is from 1/1995 to 11/2002.

Period	Wilcoxon's paired sample test statistics				Sample median values, EUR		
	Z-value	Tender offer > dividend	Dividend > tender offer	N	Median dividend	Median tender offer proceeds	Dividend > tender, % of cases
Panel A: Reinvestment ratios with range [-1, 1], tender offer versus matched dividend							
Households	10.11***	1,393	950	6,443	3,619	9,660	35.8 %
Institutions	3.47***	358	270	1,287	16,805	16,200	54.7 %
Panel B: Reinvestment ratios with range [-1, 1], tender offer versus matched special dividend							
Households	2.30**	219	179	914	5,000	3,200	52.0 %
Institutions	3.11***	89	52	268	14,853	6,609	66.4 %

Table 5

Net flow to the stock market on days 0 to 20 after a cash disbursement

Results from regressing investor trading activity on payments of dividends and tender offer proceeds. The dependent variable is an indicator function of trade and has a value of 1 if an investor has a positive net flow to the stock market on day 0, -1 if negative, and zero otherwise. The table shows coefficients for contemporary (day 0) and lagged (days 1-20) values for the amount of (log) dividends received. The observations include all trading days when an investor received corporate cash disbursements exceeding the MDIV (see Section 2.7) over a period of past 20 days. All specifications include year dummies and the specifications are estimated by using ordinary least squares with investor level fixed effects. All reported unstandardized coefficient values correspond to original values multiplied by 1,000. Asterisks mark the statistical significance levels (* for 10%, ** for 5%, and *** for 1%, respectively). The sample period is from 1/1995 to 11/2002.

	Dividends				Tender offers			
	Households		Institutions		Households		Institutions	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Intercept	-0.19	-0.14	0.32	0.14	-45.19	-1.74	51.26	2.57
Days after cash disbursement								
0	0.23	4.78**	-0.48	-3.38***	1.87	5.28**	-0.88	-0.91
1	0.35	7.30**	0.15	1.07	3.67	10.43**	0.65	0.68
2	0.11	2.24**	0.23	1.6	1.89	5.41**	1.55	1.66*
3	-0.04	-0.77	-0.05	-0.37	1.09	3.14**	0.42	0.46
4	-0.19	-4.19**	-0.17	-1.17	1.07	3.09**	-0.63	-0.68
5	-0.1	-2.11**	0.45	3.15***	0.81	2.34**	-1.52	-1.67*
6	0.01	0.25	-0.22	-1.58	0.77	2.23**	-1.2	-1.32
7	-0.16	-3.42**	-0.07	-0.51	0.56	1.63	-1.12	-1.26
8	0.05	1.09	0.07	0.5	0.28	0.82	-2.4	-2.70**
9	0.08	1.82*	0.34	2.42**	0.44	1.29	-1.07	-1.22
10	-0.12	-2.64**	0.63	4.43***	0.48	1.41	-0.86	-0.98
11	-0.28	-6.17**	-0.21	-1.47	0.59	1.72*	-0.08	-0.09
12	-0.16	-3.44**	-0.2	-1.41	0.3	0.89	-0.77	-0.9
13	-0.03	-0.74	-0.31	-2.20**	0.19	0.55	-0.45	-0.52
14	-0.19	-4.24**	-1.01	-7.05***	0.35	1.03	0.43	0.5
15	-0.42	-9.22**	-0.94	-6.53***	0.57	1.67*	0.84	0.98
16	-0.32	-6.87**	-0.95	-6.62***	0.4	1.17	-0.5	-0.58
17	-0.18	-3.81**	0.03	0.22	0.43	1.27	-1.7	-1.99**
18	0.06	1.31	0.54	3.76***	0.37	1.1	0.12	0.14
19	0.12	2.43**	0.18	1.26	0.03	0.08	-0.02	-0.02
20	0.11	2.33**	0.38	2.60***	0.32	0.95	-0.07	-0.08
<i>F</i> -test	49.69		11.89		15.35		1.82	
<i>R</i> -sqr. (overall)	0.0004		0.0004		0.0014		0.0001	
<i>N</i>	3,556,739		835,356		282,850		35,475	

Table 6

Multivariate analysis of the determinants of reinvestment

The observations comprise regular dividends, special dividends, and tender offer disbursements to all Finnish household investors. Reinvestment is measured by summing the value of trade on the payment day and the 10 subsequent trading days. Payments clustered within 10 days are aggregated, observations with clustered payments extending over 10 days are excluded. First four specifications (counting from the left) are ordered logit regressions where the dependent variable is coded as 1 if reinvestment is strictly positive, 0 if reinvestment is zero, and -1 if reinvestment is strictly negative. Specifications 5 to 8 are regular logit regressions where the dependent variable is coded as 1 if reinvestment is strictly positive, and 0 if reinvestment is strictly negative, and cases of zero reinvestment are excluded. Observations likely related to ex-day trading are excluded (defined as buying the dividend paying stock 10 or fewer days prior to the ex-day and selling the same stock in 10 or fewer days after the ex-day). Observations are limited to those where an investor has executed at least one trade during the past 250 trading days if so indicated by the row labeled “Require > 0 trades during past year”. *Tender offer* is a dummy variable taking the value of 1 if the cash disbursement is tender offer proceeds, 0 otherwise. *Comp. acquisition* is a dummy for later stage tender offers where the bidder has the right for compulsory acquisition of any remaining shares (see Section 2.3). *Special dividend* is a dummy variable for a dividend paid in addition to the regular annual dividend. *Cash flow size* is the log value of cash dividend or tender offer proceeds. The following variables are included but not reported: dummies indicating the investor’s number of stock market buys and sells during the past 250 trading days with categories 1, 2 to 5, and 6 or more, past market returns with intervals defined as in Grinblatt and Keloharju (2001), dummies for portfolio quintile except one, time in years since the start of the sample and its squared value, as well as a constant term in the case of regular logit. Robust t-values are below coefficients. Asterisks mark the statistical significance levels (* for 10%, ** for 5%, and *** for 1%, respectively). The sample period is from 1/1995 to 11/2002.

	Ordered logit: Buy-nothing-sell				Logit: Buy vs. sell			
	No	Yes	No	Yes	No	Yes	No	Yes
Require > 0 trades during past year								
Tender offer	0.321*** 11.69	0.265*** 9.76	0.367*** 12.64	0.285*** 10.06	0.552*** 12.37	0.478*** 9.49	0.624*** 13.16	0.530*** 9.88
Comp. acquisition			-0.318*** -5.08	-0.164** -2.28			-0.509*** -4.93	-0.369*** -3.06
Special dividend	-0.008 -0.26	0.006 0.20	-0.015 -0.47	0.002 0.06	0.084* 1.72	0.130** 2.53	0.07 1.45	0.122** 2.38
Cash flow size	0.105*** 9.15	0.104*** 9.36	0.103*** 8.90	0.103*** 9.18	0.119*** 6.87	0.128*** 6.90	0.114*** 6.58	0.126*** 6.75
Pseudo R-sqr.	0.0236	0.0167	0.0238	0.0168	0.0711	0.0749	0.0720	0.0753
N	188,190	84,484	188,190	84,484	18,272	15,656	18,272	15,656

Table 7

Changes in aggregate deposits and corporate cash disbursements

Results for regressions in which the monthly change in the value of aggregate deposits by Finnish households are regressed on the aggregate dividend and tender offer proceeds flows to domestic households. *Dividends* corresponds to the total value of dividends paid to domestic households in a given month. Correspondingly, *tender offer proceeds* is the total value of tender offer proceeds paid to domestic households. Specification 2 also includes lagged values of the dependent variable and lagged values for *dividends* and *tender offer proceeds*. Specification 1 is estimated with OLS, while specification 2 is estimated with maximum likelihood. *t*- (Spec. 1) and *z*-values (Spec. 2) are reported below coefficients. Asterisks mark the statistical significance levels (***) for 1% and ** for 5%, respectively). The sampe period is from 1/1999 to 2/2006.

Specification	1	2
Constant	-959.10***	-678.94
	-2.90	-0.27
Lagged value of dependent variable		-0.51***
		-5.18
Dividends	0.81**	0.71
	2.43	1.37
Lagged dividends		0.16
		0.41
Tender offer proceeds	0.09	-0.09
	0.14	-0.05
Lagged tender offer proceeds		0.50
		0.44
January dummy	-709.65***	-924.78***
	-4.10	-5.52
December dummy	1572.08***	1752.70***
	8.75	15.93
Year dummies	Included	Included
<i>F</i> -test statistic	11.99	
Wald-statistic		420.47
Adjusted R-sqr.	0.587	
N	86	85