Who Reacts to News?

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Abstract

We examine the trading behavior of institutional investors in response to cash flow and discount rate news, conditional on their investment horizon. We find that short-term institutions have a preference for trading around cash flow news, while long-term institutions prefer trading around discount rate news. We also find that short-term institutions sell on discount rate news, while long-term institutions buy on discount rate news. These news preferences are consistent with theories regarding the differing roles that short and long horizon institutions play in capital markets. Further, we find a positive relationship between firm size and institutional reaction to both types of news. We also show that the historic broad market return under-reaction to cash flow news has been primarily relegated to the negative cash flow news of small firms.

JEL Classification: G11; G12; G14
Keywords: cash flow news, discount rate news, institutional ownership, investment horizon

1 Introduction

The role of institutional ownership in predicting individual stock returns is well documented in the literature (Gompers and Metrick, 2001; Nofsinger and Sias, 1999; Wermers, 1999). One common explanation is that institutions have an informational advantage over individuals (e.g., incorporating new information about firms' future prospects into stock prices).[1] Further, extant literature has established the heterogeneity of institutional investors' holding preferences and return predictability in the cross section (Falkenstein, 1996) and through time (Bennett et al., 2003).[2] Pertinent to our study, Yan and Zhang (2009) show that the holdings and trades of institutions with relatively shorter trading horizons subsumes the return predictability of institutions with longer trading horizons and that trading by short horizon institutions anticipates earnings news. Building on their results, we argue that not all institutional trades are similarly motivated and that institutions respond to cash flow and discount rate news depending on their investment horizon. Thus, this paper focuses on the joint behavior of returns, the trading patterns of different institutional investors, and cash-flows and discount-rates news.

Following the discounted cash flows approach to valuation, Campbell and Shiller (1988) and Campbell (1991) propose that stock returns can be decomposed into unexpected changes, or "news", about either the firm's future cash flows or the firm's discount rate. Cohen et al. (2002) find that institutional investors as a group are particularly responsive to cash flow news. They show that positive (negative) shocks to cash flow news are associated with significant increases in institutional purchasing (selling) and that institutions tend to reduce their positions when firms experience positive returns that are unrelated to cash flow news.

[1] For instance, Cohen et al. (2002) shows that as a group institutional investors exploit the under-reaction to cash flow news by individual investors by purchasing shares from (selling shares to) individuals when there is positive (negative) cash-flow news.

[2] Researchers have explored multiple classifications of institutional investors. Gaspar et al. (2005) and Yan and Zhang (2009), for instance, classify institutions based on the turnover of their portfolio, while Bushee (2001) classifies institutions based on their preference for short run or long run earnings. Other commonly examined aspects include investor identity (Dai, 2007), manager type (Hotchkiss and Strickland, 2003), and stake holdings (Ali et al., 2008).

They attribute these institutional trading patterns to institutions arbitraging the short run under reaction to cash flow-news by individual investors.

Given that institutional trading patterns are conditional on their holding periods (Yan and Zhang, 2009), and that institutions are sensitive to cash flow news (Cohen et al., 2002), we hypothesize that institutional investors will respond differently to cash flow news, conditional on their investment horizon. Specifically, we propose that short term institutions will be relatively more sensitive to cash flow news when compared to their long term counterparts. The trading decisions of short term institutions are generally attributed to either superior information (Yan and Zhang, 2009), momentum, or herding strategies (Badrinath and Wahal, 2002; Nofsinger and Sias, 1999). These motives imply strategies which rely on frequent trading and where returns are derived from individual stock selection due to either superior information or market timing. Since firm level returns are driven primarily by cash flow news, (Vuolteenaho, 2002), and individual security selection is relatively more important for short term institutions, we expect that their trading will be driven primarily by cash flow news.

Relative to their short term peers, long horizon institutions focus on the long term earnings potential of their investments (Bushee, 2001), do not trade to exploit the post-earnings announcement drift (Ke and Ramalingegowda, 2005), trade less prior to breaks in positive earnings stings (Ke and Petroni, 2004), and generally benefit from their investments over long horizons by acting as monitors (Chen et al., 2007). In general, these empirical results are consistent with the stylized view that long term institutions rely on the ability to realize the long run expected returns of their holdings. Rather than individual security selection, their overall strategies are driven by asset allocation and their returns are mainly generated by their exposure to market risk and other known systemic risk factors. Campbell and Ammer (1993) show that discount rate news, not cash flow news, is the primary driver of systemic risk. They also show that the systematic risk of size and industry portfolios

are driven by discount rate news. Taking these results into account, we hypothesize that discount rate news will be relatively more informative of long term institutional trading.

Following Yan and Zhang (2009), we classify institutions as short or long term institutional investors by calculating their portfolio churn rate (i.e. their portfolio turnover). Using 13F institutional holdings data from 1983 to 2013, we identify total institutional ownership, and within it short and long term institutional ownerships, for each firm in our sample. We create measures of cash flow and discount rate news by following the vector auto-regression (VAR) methodology in Cohen et al. (2002).[3] Using these measures, we investigate (i) whether institutional trading patterns in our updated sample are still consistent with institutions arbitraging under-reaction to cash flow-news persists in our updated sample, (ii) whether institutions with different horizons are equally motivated to profit from this under-reaction, and (iii) whether the institutional investment horizon is a determinant factor in their reaction to cash flow and discount rate news.

Our results can be summarized as follows: First, we replicate Cohen et al. (2002) and document that during the more recent period, there is still a significant (albeit smaller) under-reaction to cash flow news.[4] Second, although both short and long term institutions generally buy on positive cash flow news, results show that the long term institutions are the ones mainly trying to arbitrage the under-reaction to cash flow news, while short term institutions simply buy the on cash flow news due to preferences. Finally, consistent with our intuition, we find that short term institutions prefer to trade on the cash flow news over discount rate news, while long term institutions prefer the opposite. These different preferences for cash flow and discount rate news can potentially explain the results from the institutional preferences literature, where short and long term institutions are documented to have different preferences for size, book-to-market and other variables which can all be

[3]Our VAR specification incorporates information from shocks to stock returns, profitability, book-to-market ratio, and institutional ownership (different from Cohen et al. (2002), we separate long and short term institutional ownership as part of our VAR specification).

[4]Specifically, the stock price moves on average, approximately 82 cents given a $1 cash flow news, indicating an under-reaction of 18 cents. In contrast, Cohen et al. (2002) document an average under reaction of 41 cents.

traced back to identify stocks that are more likely to experience either cash flow or discount rate news. We detail our findings below.

To see whether there is any merit to the hypothesis that investment horizon determines institutional reaction to news, we start by independently sorting stocks into quintiles based on their level of cash flow and discount rate news and we investigate whether short and long term institutions exhibit a significantly different reaction based on the level and type of news. Short term institutions tend to buy on positive cash flow news and sell on negative cash flow news, regardless of the level of discount rate news (i.e. their preference for cash flow news dominates their preference for discount rate-news). In contrast, long-term institutions do not consistently exhibit a buy or sell pattern based on cash flow news - instead, long-term institutions tend to buy on positive discount rate-news (unexpected increases in a firm's discount rate) and sell on negative discount rate news (unexpected decreases in a firm's discount rate), regardless of the level of cash flow news (i.e. their preference for discount rate news dominates their preference for cash flow news). Furthermore, short term institutions have a significantly larger reaction to cash flow news relative to long-term institutions,[5] while long term institutions have a significantly larger reaction to discount rate news relative to their short term counterpart. Generally, the results from our univariate analysis support our hypothesis that short horizon institutions are more likely to trade in response to cash flow news while long horizon institutions are more likely to respond to discount rate news. We find similar results when we regress short and long run institutional ownership on both cash flow and discount rate news.

We extend our analysis to a multivariate setting by predicting the investment level of short and long term institutions as a function of current cash flow and discount rate news. We include controls that attempt to capture other drivers of institutional ownership such as book-to-market, firm age, prior returns, index inclusion, and total volatility. As a group, institutions overall prefer to own stocks that recently exhibited positive cash flow or discount

[5]This pattern holds true for all quintiles of discount rate news except the largest one (i.e., in the presence of high discount rate news, short and long term institutions react similarly to cash flow news).

rate news, but this result is mainly driven by long term institutions. Furthermore, for long term institutions, the magnitude of the coefficient on discount rate news is double that of cash flow news (reflecting that their preference for discount rate news is relatively larger compared to their preference for cash flow news). In contrast, short term institutions prefer stocks that recently experienced positive cash flow news and dislike stocks with large discount rate news. Overall, our multivariate results are consistent with our hypothesis that short-horizon institutions rely on cash flow news to make investment decisions while long horizon institutions rely relatively more on discount rate news to make investment decisions.

We further extend our analysis to investigate whether there is any difference in institutional reaction to news depending on the size of the stock and on the direction of the news (positive or negative). We show that, in the case of cash flow news, both short and long term institutions increase their holdings especially in response to positive to cash flow news about large firms (this is consistent with Cohen et al. (2002), who document that institutional response is weakest for bad news about small stocks). In the case of discount rate news, we find that long term institutions indeed react more to discount rate news about large firms relative to small firms. In contrast, short term institutions do not generally respond to positive discount rate news, except for the largest firms (consistent with the idea that short-term institutions focus their information gathering on cash flow news, rather than discount rate news). Overall, our results are consistent with the institutional ownership literature (Nagel, 2005) that shows that there is an asymmetric response to information events dependent on firm size and type of news (negative vs. positive). In addition, we also document that there are significant differences in institutional reaction to news based on their investment horizon: specifically, short term institutions react significantly more (less) than long term institutions in response to cash flow (discount rate) news, regardless of the type of stock and whether they are faced with good or bad news.

Finally, we evaluate the information content of institutional portfolio allocations by investigating the relation between different types of aggregate level ownerships and (i) a

CRSP value-weighted portfolio that is funded by shorting T-bills, as well as (ii) two additional zero-cost portfolios as our test assets: the first longs stocks that have had positive cash flow news in the past and short stocks that have had negative cash flow news (i.e., CF news portfolio); the second follows the same strategy based on discount rate news (DR news portfolio). The idea is to see whether their trading in response to cash flow and discount rate news is aggressive enough to generate significant deviations from a passive strategy. Our results show that short term institutions are most aggressive in deviating from the passive CRSP value weighted index strategy (relative to long term institutions and individuals). Overall, institutions seem to under-weight the market and go long on cash flow and discount rate news portfolios. However, when splitting institutions based on their investment horizon, we show that long term institutions are short the cash flow news portfolio and long the discount rate news portfolio, while short term institutions are long the cash flow news portfolio and short the discount rate news portfolio.

This paper contributes to two distinct streams of literature. First, we advance the institutional ownership literature by showing that the preference for cash flow news is conditional on investment horizon. Short term institutional investors purchase on cash flow news, while long term institutions sell on cash flow news. Second, to our knowledge, we are the first paper to examine institutional preferences for discount rate news. We show that long term institutions more focused on discount rate news, relative to short term institutions. Each of these findings are consistent with the common view of short term institutions as momentum traders focused on near term outcomes and long term institutions as value investors or relationship investors focused on long term outcomes. The remainder of the paper proceeds as follows. In Section 2, we discuss our data and methodology. Section 3 presents our main empirical results and discusses their implications. Section 4 identifies several robustness checks and Section 5 concludes.

2 Data and Methodology

2.1 Methodology

Our primary objective is to examine whether different types of institutions (i.e. short- and long-term institutions), driven by different investment horizons and restrictions, manifest different preferences for cash flow and discount rate news in their respective portfolios. This section describes our methodology for decomposing stock returns in order to identify cash flow and discount rate news, as well as the method used to classify long- and short-term institutions. Definitions of all variables used in this study can be found in the appendix.

2.1.1 Stocks Return Decomposition

Campbell and Shiller (1988) derive a log-linearization of returns and demonstrate that unexpected equity returns can be decomposed into two components: changes in the expectations about future cash flows (the cash flow component) and changes in the expectations about discount rates (the expected return component). The approach is as follows:

$$\begin{aligned} e_{t+1} =& r_{t+1} - E(r_{t+1}) \\ =& (E_{t+1} - E_t) \sum_{j=0}^{\infty} \rho^j \Delta d_{t+1+j} - (E_{t+1} - E_t) \sum_{j=0}^{\infty} \rho^j r_{t+1+j} \\ =& N_{CF,t+1} - N_{DR,t+1}, \end{aligned} \tag{1}$$

where r_{t+1} is the log of equity returns, d_{t+1} is the log dividend paid by this stocks, ρ is the discount parameter, E_t is the expectation taken at time t, and Δ is the one period change.

This decomposition tells us that the unexpected stock return can be positive because of a decrease in expected returns or an increase expected cash flows. On the one hand, holding the discount rate constant, an increase in the price of a stock should be followed by higher

future cash flows; on the other hand, holding cash flows constant, the price of a stock goes up if discount rates drop.

2.1.2 VAR Methodology

We employ a VAR system to implement the return decomposition described above (Campbell, 1991; Campbell and Ammer, 1993; Cohen et al., 2002; Vuolteenaho, 2002). Using $z_{i,t}$ to denote the vector of firm-specific variables that describe firm i at time t, a firm's state vector follows a first order evolution:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t}. \tag{2}$$

Using the returns decomposition implied by the above VAR system, we can express discount rate news and cash flow news as:

$$\begin{aligned} \tilde{N}_{DR,i,t} =& \lambda' u_{i,t} \\ \tilde{N}_{CF,i,t} =& (e1' + \lambda') u_{i,t}, \end{aligned} \tag{3}$$

where λ' is defined as $e1'\rho\Gamma(I - \rho\Gamma)^{-1}$ and $e1' = [1 \quad 0 \quad ... \quad 0]$. When implementing the VAR model described above, we start by considering the state variables used by Cohen et al. (2002), which are the market-adjusted log stock return (the first element of the state vector z); market adjusted log book-to-market ratio (the second element); market adjusted log profitability (the third element); and the market-adjusted fraction of shares outstanding owned by institutions (the fourth element).[6] We then separately identify the market-adjusted fraction of shares outstanding owned by short-term and long-term institutions (i.e., SIO and LIO, respectively) in addition to the market-adjusted total institutional ownership (TIO).

Using the estimates from the VAR system above, we study the reaction of prices and institutional ownership to cash flow and discount rate news. Specifically, we consider

[6] See the appendix for a definition of these variables.

regressions of return and institutional ownership shocks (defined as the error terms from the corresponding equations in the VAR system) on cash flow and discount rate news as defined in equation 3. For example, making the same assumptions that Cohen et al. (2002) did, one can run a regression of unexpected returns on cash flow news and use the coefficient estimate to gauge whether the market's reaction to this kind of news is excessive, correct, or insufficient. Overreaction, for instance, would be defined as $b > 1$ in the following regression:

$$\tilde{r_{i,t}} = a + b\tilde{N}_{CF,i,t} + \epsilon_{i,t} \tag{4}$$

As Cohen et al. (2002) point out, a positive cash flow news should be completely incorporated by the market and, in theory, there is no over or under-reaction ($b = 1$). However, if the stocks are undervalued (overvalued) relatively to their positive (negative) cash flow news, then we will observe underreaction, where $b < 1$ (overaction, where $b > 1$). Similarly, we examine how the ownership structure responds to each type of news by looking at the estimated regression coefficients of institutional ownership shocks on cash flow and discount rate news. For example, to estimate the overall reaction of institutions to news, we estimate the following equation:

$$\tilde{IO}_{i,t} = a + b\tilde{N}_{CF,i,t} + \epsilon_{i,t} \tag{5}$$

where $\tilde{IO}_{i,t}$ represent the innovations in institutional ownership from the VAR system. A positive (negative) coefficient on $\tilde{N}_{CF,i,t}$ would imply that on average institutions buy (sell) on positive cash flow news. To capture potentially different reactions of short- and long-term institutions, we further use the shocks to short- and long-term institutional ownership from our modified VAR model as left hand side variables in equation (5) above.

2.1.3 Institutional Ownership and Investment Horizons

Using the quarterly 13F data, we define total institutional ownership (TIO) for each stock i as the ratio of shares of stock i held by all institutions in quarter t to the total number of

shares outstanding for stock i in quarter t:

$$\text{TIO}_{i,t} = \frac{\text{Shares Held by Institutions}_{i,t}}{\text{Total Shares Outstanding}_{i,t}} \tag{6}$$

We differentiate between different types on institutional ownership by decomposing the measure above into ownerships by short-term, mid-term, and long-term institutional investors. We measure investment horizons of institutional investors at given points in time based on their quarterly portfolio turnover over the past year using investor churn rates (Gaspar et al., 2005; Yan and Zhang, 2009). Specifically, the churn rate for each quarter t of investor k is defined as

$$\text{CR}_{k,t} \equiv \frac{\min\left(\text{Churn}^{\text{buy}}_{k,t}, \text{Churn}^{\text{sell}}_{k,t}\right)}{\frac{1}{2}\sum_{i\in I}\left(N_{i,k,t}P_{i,t} + N_{i,k,t-1}P_{i,t-1}\right)}, \tag{7}$$

where

$$\text{Churn}^{\text{buy}}_{k,t} = \sum_{i\in I; N_{i,k,t} > N_{i,k,t-1}} \left|N_{i,k,t}P_{i,t} - N_{i,k,t-1}P_{i,t-1} - N_{i,k,t-1}\Delta P_{i,t}\right| \tag{8}$$

and

$$\text{Churn}^{\text{sell}}_{k,t} = \sum_{i\in I; N_{i,k,t} \leq N_{i,k,t-1}} \left|N_{i,k,t}P_{i,t} - N_{i,k,t-1}P_{i,t-1} - N_{i,k,t-1}\Delta P_{i,t}\right| \tag{9}$$

measure aggregate purchase and sale, respectively.

In the above equations, $i \in I$ is a firm held in investor k's portfolio I. $N_{i,k,t}$ denotes the number of shares of firm i that is being held in investor k's portfolio I at the end of quarter t. $P_{i,t}$ is the price per share of firm i at the end of quarter t. The quarterly churn rate $\text{CR}_{k,t}$, as defined in equation (7), thus captures the portfolio turnover of an institutional investor during the past quarter.[7]

[7] Citing concerns regarding the information content of flow-induced trading (Alexander et al., 2007), we calculate churn rates as defined by Yan and Zhang (2009), who use the minimum of aggregate purchase and sale, as opposed to the sum of aggregate purchase and sale as in Gaspar et al. (2005).

The investment horizon at a given quarter end t that is specific to each investor k is determined using the average churn rate for the investor over the past four quarters, i.e.,

$$\text{avgCR}_{k,t} = \frac{1}{4}\sum_{t'=0}^{3} \text{CR}_{k,t-t'}. \tag{10}$$

Intuitively, a higher average churn rate implies a shorter investment horizon. At each calendar quarter end, we sort institutional investors according to their average churn rates into terciles. We classify investors in the top tercile as short-term institutional investors and those in the bottom tercile as long-term institutional investors, leaving the middle tercile as mid-term institutional investors.

At the firm level for each calendar quarter, a firm i would have a portion of its equity that ranges from 0% to 100% being held by institutional investors (i.e., TIO). Using the terciles determined by rankings of average churn rates for each of those calendar quarters at the investor level, we then decompose total institutional ownership into three components: short-term institutional ownership (SIO), mid-term institutional ownership (MIO), and long-term institutional ownership (LIO).

2.2 Data and Sample

Our sample consists of U.S. firms in the CRSP-Compustat Merged (CCM) Database from 1983 to 2013. We include all firm-year observations with available data for the construction of our variables. In the appendix, we include detailed descriptions for all the variables used in this study. Following Cohen et al. (2002, Appendix B.1), we impose the following filters:

- A valid equity figure must be available for $t-1$, $t-2$ and $t-3$, and a valid trade should be available during the month immediately preceding the period t return.
- There is at least one monthly return observation during each of the preceding five years.

- Delisting returns are included when available in CRSP; when delisting returns are missing, we assume a -30% delisting return if the delisting is performance-related and a 0% delisting return otherwise.[8]

We use log transformations of stock return, profitability, and book-to-market ratio in most of our tests. These transformations can cause problems if the variables are close to zero or infinity. Hence, we follow Cohen et al. (2002) and Vuolteenaho (2002) in redefining each firm as a portfolio of 90% of its common stock and 10% Treasury bills based on market values. We rebalance the portfolios to these weights each year. Doing so affects not only stock return and accounting return on equity, but also book-to-market equity, pulling the ratio slightly towards one. Consistent with prior literature, our variables are sufficiently well-behaved for log transformations after including this risk-free asset.

We obtain institutional ownership information from the Thomson Reuters (TFN) Institutional Holdings file, which includes institutional investors' stock holdings as reported in the Securities and Exchange Commission (SEC) Form 13F. All institutions with more than $100 million assets under management (AUM) are required to report all equity positions greater than 10,000 shares or $200,000 in market value to the SEC at the end of each quarter. These institutions should file 13F reports within 45 days of the end of the calendar quarter. If the firm is not covered by 13F reports, we set their institutional holdings to 0% because it is likely that their holdings do not meet the SEC filing requirements (Grinstein and Michaely, 2005). We define total institutional ownership for each stock as the ratio of shares held by all institutions to the total number of shares outstanding for that particular stock. We follow Yan and Zhang (2009) to classify institutional investors as short- or long-term based on their portfolio turnover over the past four quarters (see Section 2.1.3 and the appendix for more detailed descriptions).

Since we build on the methodology described in Cohen et al. (2002), most of our results are based on annual VAR systems, where we use the end of year t-1 accounting information to

[8]The delisting-return assumptions follow Cohen et al. (2002) and are based on Shumway's (1997) results.

predict returns from July of year t through June of year t+1. We use institutional ownership data as of June 30 of year t as the variable corresponding to the returns over the period mentioned above. We market adjust the variables in our VAR systems by cross-sectionally demeaning each of them.

Our final annual sample covers the period from 1983 to 2013 and consists of 82,760 firm-year observations. Table 1 shows the descriptive statistics.

[Insert Table I about here]

The descriptive statistics presented in Panel A of Table 1 are comparable to the ones presented in Table 2 by Cohen et al. (2002). Overall, we observe lower average log returns and ROEs during our sample period (0.033 vs 0.074 and -0.0088 vs 0.027, respectively). Medians are closer in value to those presented by Cohen et al. (2002), reflecting the fact that the negative economic conditions reflected in our extended sample period skew our distribution to the left. Average total institutional ownership is slightly higher in our sample, reflecting the overall increase in institutional ownership over the more recent past (37.76% vs 36.3%). On average, 8.5% shares are held by short-term institutions, and 12.35% of shares are held by long-term institutions. The contemporaneous correlations presented in Panel B are qualitatively similar and follow the same direction as the ones presented by Cohen et al. (2002). In terms of market-adjusted data, short- and long-term institutional ownership seems to present the same contemporaneous relation with our main variables of interest as total institutional ownership. In contrast, the first order autocorrelations presented in Table C show that current returns have a negative and weak relation with past SIO and a positive and relatively stronger relation with LIO. In this case, the positive relation between past total institutional ownership and current returns documented by Cohen et al. (2002) (and confirmed in our sample period) seems to be driven by the long-term institutions.

3 Main Results

3.1 VAR Estimates

Table II reports the results from the vector autoregressive (VAR) system that we employ to decompose unexpected stock return into a cash flow component and a discount rate component (Campbell, 1991; Cohen et al., 2002; Vuolteenaho, 2002). In short, the system integrates information from shocks to stock returns, profitability, book-to-market, and total, short-term, and long-term institutional ownerships to cash flow news (i.e., our empirical proxy for the cash flow component in unexpected return).

[Insert Table II about here]

Following this construction, our cash flow news captures how shocks to our VAR state variables drive changes in the predicted long-run stock price (i.e., cash flow news captures the change in the permanent component of stock price). Given the assumption that price changes can be driven either by shocks to expected cash flows and/or by shocks to discount rates, realized returns would be identical to cash flow news if discount rates do not change.

The choice of our state variables is motivated by prior empirical literature on return predictability and the purpose of our study. First, past short-term winners (long-term losers) have historically outperformed past short-term losers (long-term winners) (De Bondt and Thaler, 1984; Jegadeesh and Titman, 1993, 2001). Second, firms with high book-to-market equity are associated with higher stock returns (Rosenberg et al., 1985; Fama and French, 1993). Third, more profitable firms have earned higher stock returns historically (Haugen and Baker, 1996). Fourth, research has found that institutional ownership forecasts equity returns (Wermers, 1999). Finally, including short-term and long-term institutional ownership in addition to total institutional holdings allows us to incorporate the heterogeneity of institutions into our prediction. The exact state variables that we use are (i) market-adjusted log stock returns, (ii) log book-to-market equity, (iii) log ROE, and the fractions of (iv) total institutional ownership, (v) short-term institutional ownership, and (vi) long-

term institutional ownership. By definition, cash flow news is a summary of the information contained in all of our VAR state variables.

For each state variable, one lag is used to predict the evolution of the state vector. In estimating the VAR parameters, we use the weighted least squares approach where the data for each firm-year is deflated by the number of firms in the corresponding cross-section (Cohen et al., 2002).

As reported, we see that higher stock returns are preceded by higher returns during the past year, higher book-to-market, higher profitability, and higher total institutional holding, with estimated coefficients of 0.070, 0.046, 0.089, and 0.097, respectively, consistent with those found in Cohen et al. (2002). Also consistent with prior literature, profitability yields estimated coefficients that are of the same signs as those for expected returns. Further, lower SIO and higher LIO are associated with higher returns going forward, with the estimated coefficients for SIO and LIO being -0.166 and 0.097, respectively. All coefficient estimates are significant at the 1% level.

3.2 Double Sort

We start by investigating whether short- and long-term institutions exhibit different trading behaviors in response to CF and DR news. Table III independently sorts stocks into five portfolios based on their cash flow (CF) and discount rate (DR) news, which are derived from our VAR system. In Panels A and B we report the average contemporaneous changes in short-term institutional ownership (SIO) and long-term institutional ownership (LIO), respectively, for each of the corresponding cells. In Panel C, we report the differences between SIO and LIO for each cell. Based on the results, we make two immediate observations:

[Insert Table III about here]

First, short-term and long-term institutions investors exhibit different buying and selling patterns given the combinations of CF and DR news. Short-term institutions more likely buy on high CF news and sell on low CF news, regardless of the level of DR news (the

top/bottom quintile CF news lines in Panel A are positive/negative across all quintiles of DR news). This is interesting in comparison to results discussed in Cohen et al. (2002), as it implies that short-term institutions actually have a preference for CF news, rather than buying on CF news simply because of their positive correlation with DR news. In contrast, long-term institutions present a more predictable pattern in relation to DR news - they decrease their positions in response to low DR news and increase their position in response to low DR news, regardless of the level of CF news (the first/last columns in Panel B are negative/positive across all quintiles of CF news).

Together, higher CF news is associated with a higher tendency to buy for both short-term and long-term institutions. That is, despite the actual signs of the changes in SIO and LIO, both ownership types tend to be more positive as CF news becomes higher. For every DR news quintile (i.e., in each column), both SIO and LIO are monotonically increasing in CF news (i.e., from the top row to the bottom row in both panels). As shown at the bottom of both panels, all differences between the bottom (highest CF news) and the top (lowest CF news) cells are significantly positive. Thus, institutional ownerships, whether short-term or long-term, more likely increase when CF news is high.

Institutions react to DR news differently, however. For long-terms institutions, higher DR news is associated with more positive changes. Similar to the earlier LIO pattern observed for CF news, in every CF news quintile (i.e., in each row), LIO is monotonically increasing in DR news (i.e., from the left column to the right column in Panel B). All differences between the highest DR news quintile and the lowest DR news quintile are significantly positive, indicating that long-term institutional ownership more likely increases when DR news is high. For short-term institutions, things are not as clear. While there is an overall pattern that changes in SIO tend to be more negative as DR news is higher, it is not as strong as in the cases for the other aforementioned patterns. For instance, in the lowest CF news quintile, the changes in SIO for the lowest and highest DR news quintiles are not significantly

different. Further, when examining cell by cell from the left to the right in Panel A we do not necessarily see monotonically decreasing changes in SIO.

Second, short-term and long-term institutions show different magnitudes of changes as their reactions to CF and DR news. For SIO, we see from Panel A that the differences between the top and bottom quintiles of CF news (see the bottom-most row in Panel A) are larger in magnitude than those between the top and bottom quintiles of DR news (see the right-most column in Panel B). LIO shows the opposite. From Panel B, we see that the differences between the top and bottom quintiles of CF news are smaller in magnitude than those between the top and bottom quintiles of DR news. These indicate that the investment decisions of short-term institutions are mainly driven by CF news, while those of long-term institutions are more strongly driven by DR news.

Panel C provides additional information. We find that the differences in ownership changes between SIO and LIO are overall positive when CF news is high and negative when DR news is high. In other words, short-term institutions have a significantly larger reaction to CF news relative to long-term institutions, while long-term institutions have a significantly larger reaction to DR news. This is preliminary evidence in support of our hypothesis that institutions with short horizon are more likely to trade in response to CF news, while institutions with longer horizons are more likely to respond to discount rate news. Moreover, the results in Panel C also support the idea that short-term institutions likely trade on CF news because of preferences, while long term institutions probably buy/sell on CF news in an attempt to take advantage of the higher/lower expected returns that are likely to follow.

3.3 Returns and IO Regressions on News

In Table IV, we report the regression coefficient estimates of stock return shocks and institutional ownership shocks on cash flow and discount rate news, which we derive from the market-adjusted VAR system in Table II. Panel A regresses stock-return shocks on CF

news. Panels B, C, and D estimate total, short-, and long-term institutional ownership shocks, respectively, via two estimations: Model 1 uses CF news as the only independent variable, while Model 2 uses both CF news and DR news.

[Insert Table IV about here]

The coefficient of realized stock return on contemporaneous cash flow news is 0.825, indicating and confirming earlier findings of underreaction of stock prices to news about future cash flows (Vuolteenaho, 2002; Cohen et al., 2002). Intuitively, stock price moves, on average, 82.5 cents given a $1 cash flow news, indicating an underreaction of approximately 18 cents.

We also find that both short-term and long-term institution ownership shocks are significantly positive on CF news. The estimated coefficients of CF news for the SIO and LIO models are 0.043 and 0.032, respectively. That is, both types of institutions buy on cash flow news.

In order to disentangle the possibilities that institutions may be capitalizing on the underreaction phenomenon or that they may be simply chasing after good cash flow news, we re-estimate the SIO and LIO models while including discount rate news in addition to cash flow news. We find that SIO buys on cash flow news and that the estimated coefficient on cash flow news does not really change after including discount rate news in the estimation. LIO, however, tells a different story. While they also buy on good cash flow news, the estimated coefficient for cash flow news drops from 0.032 to 0.010 once discount rate news is included. Together, these results confirm that short-term institutions buy on cash flow news due to preferences, while long-term institutions buy on cash flow news because they like the higher expected returns that are associated with the underreaction to cash flow news.

3.4 Institutional Investment Preferences

Next, we study the investment preferences of institutional investors under a multivariate setting. In Table V, we report results from Fama-MacBeth estimations for different types

of lead ownership levels. For Models 1, 2, and 3, the dependent variables are lead total institutional ownership, lead short-term institutional ownership, and lead long-term institutional ownership, respectively. The main independent variables are the cash flow news and the discount rate news derived from the VAR system in Section 3.1. In addition, we control for various firm-level characteristics that are widely accepted as determinants of institutional holdings (Gompers and Metrick, 2001; Yan and Zhang, 2009). These include proxies for prudence (firm size, age, dividend yield and SP 500 index membership; Del Guercio, 1996), market frictions (e.g., liquidity and transaction costs as captured by firm size, stock price, and turnover), and predictors of equity returns (firm size and book-to-market ratio; Fama and French, 1992; Jegadeesh and Titman, 1993). Due to collinearity concerns, we orthogonalize cash flow news and market cap and report standardized beta coefficients.

[Insert Table V about here]

Our control variables in the overall institutional preference estimation yield regression coefficients that are of the same signs as those found in prior studies. As in Yan and Zhang (2009), for instance, we see that institutions collectively prefer larger firm size, older firms, lower dividend yield, and higher turnover. Contrasting Models 2 and 3, we observe both similarities and differences between short-term and long-term institutions. Both types of institutions prefer to invest in firms that are larger and have lower dividend yields. Short-term institutions prefer to invest in younger firms, while long-term institutions prefer older ones. Further, short-term institutional ownership is associated with stocks with higher turnover and long-term ownership is associated with stocks with lower turnover.

Our preference estimation results also suggest that institutional investors as a whole prefer both higher cash flow news and higher discount rate news. The estimated coefficients for cash flow news and discount rate news are 0.113 and 0.104, both statistically significant at the 1% level.

Importantly, we find that the two groups of institutions exhibit different preferences for the news. Short-term institutions prefer cash flow news over discount rate news, and long-term institutions show the opposite. The estimated coefficients for cash flow and discount rate news are 0.159 and -0.013 for the lead SIO estimation (Model 2) and 0.043 and 0.128 for the lead LIO estimation (Model 3). While long-term institutions like both cash flow news and discount rate news, the estimated coefficient of the latter is of much larger magnitude. Further, short-term institutions appear to prefer pure cash flow news more than long-term institutions do. The estimated coefficient on cash flow news for SIO is significantly larger than the estimated coefficient of discount rate news in the same model (0.159 vs -0.013). It is also approximately four times larger than the cash flow news coefficient for LIO in Model 3 (0.159 vs 0.043). These findings are consistent with our earlier results reported in Table IV.

3.5 Size Results

Vuolteenaho (2002) shows that the aggregate market has a larger under reaction to cash flow news among smaller firms, and Cohen et al. (2002) documents that this size effect holds for institutions, though the total institutional under reaction is muted relative to the individual investor. In Table VI we examine how the overall market, SIO, and LIO react to cash flow news and discount rate news conditional on the firm size. For each year in our sample, we sort firms into size quintiles based on their market capitalization. We reestimate the VAR model show in Equation 2 for each size quintile and construct cash flow news and discount rate news following Equation 3. Our main analysis in this section focuses on the coefficients from the regression of excess returns, SIO, and LIO on cash flow news and discount rate news for each of our size deciles (Equations 4 and 5). We construct these coefficients following the Fama and MacBeth (1973) cross sectional methodology.

[Insert Table VI about here]

In Panel A of Table VI we report the coefficient of excess returns regressed on cash flow news for each size quintile. Similar to our results in Table IV, the coefficient from the models in Panel A can be interpreted as the over or under reaction to one dollar of cash flow news. For the smallest quintile of firms in our sample, we find that the market under-reacts to the cash flow news by approximately seventeen cents, and for the largest quintile we find an over reaction to cash flow news of approximately four cents. The size of the under reaction is decreasing with firm size. We also test the difference between the coefficients of the small and big quintiles, and we find that the spread between the smallest and largest quintiles is 21 cents and significant at the one percent level. Compared to prior research [9], it appears that the under reaction to cash flow news has become less severe across size quintiles, and the spread between the smallest and largest quintiles has decreased.

In Panel B of Table VI we report the coefficients of SIO and LIO ownership regressed on cash flow news and discount rate news, and the means tested differences between the smallest and largest size quintiles. The first two columns of Panel B report the cash flow news and discount rate news coefficients from the SIO models for each size quintile. After positive cash flow news, we find that short run institutions increase their ownership by 2.3 (7.6) percent for firms in the smallest (largest) quintile. After positive discount rate news, we find that short run institutions decrease their ownership by 2.9 (13.6) percent for the smallest (second largest) quintile.[10] Generally, these results suggest that SIOs increase (decrease) ownership on positive cash flow news (discount rate news), and their reaction is increasing with firm size.

The second two columns of Panel B report the cash flow news and discount rate news coefficients from the LIO models for each size quintile. After positive cash flow news, we find that long run institutions increase their ownership by .9 (5.6) percent for firms in the smallest (largest) quintile. After positive discount rate news, we find that long run institutions

[9] Cohen et al. (2002) reports an under reaction of 45 cents for the smallest quintile of firms and over reaction of one cent for the largest quintile of firms.

[10] For the largest quintile the coefficient on discount rate news for SIOs is .03 but insignificant.

increase their ownership by .5 (32.3) percent for the smallest (largest) quintile. These results suggest that LIOs increase ownership on both positive cash flow news and discount rate news, and their reaction to the news is increasing with firm size. Comparing the size of the reaction to cash flow news between the short and long run institutional owners, we find that magnitude of the SIO reaction is much larger than that of LIOs across all size quintiles. We also find that SIOs and LIOs are trading the opposite direction on discount rate news across size quintiles.

3.6 Asymmetric Response to News

In Table VII we examine the asymmetric response of the market, SIO, and LIO to cash flow news across the size spectrum. We follow Cohen et al. (2002) and construct an additional variable n_cf for our analysis that takes on the value of the maximum of zero or cash flow news derived from our VAR model. We interpret this coefficient as the reaction to negative cash flow news relative to the point estimate of the coefficient on cash flow news. To test the asymmetric market reaction we regress market adjusted returns on cash flow news and n_cf. We present the coefficients from this model in Panel A of Table VII. In our sample, we find that the under reaction to cash flow news is primarily concentrated in the response to negative news from smaller firms. For the smallest firms the coefficient on cash flow news is 1.016 and the coefficient on n_cf is -.330. This suggests that reaction to a dollar of negative cash flow news is .686 (1.016 - .330). For the largest of firms the coefficient on cash flow news is 1.048 and the coefficient on n_cf is -.006. In the case of the largest firms the market reaction to negative cash flow-news is not significantly different than the reaction to positive cash flow news. These results are interesting when compared to the results of Cohen et al. (2002), which finds a market under reaction to both positive and negative cash flow news. Our findings suggest that the under-reaction to positive cash may have been arbitraged away since their findings. Most of the remaining under-reaction in our sample is relegated to negative news about smaller firms, which is consistent with the common idea

that many institutional investors are unable to exploit anomalies that involve shorting small firms (Nagel, 2005).

[Insert Table VII about here]

In Panels B and C of Table VII we report the results of SIO and LIO regressed on cash flow news, n_cf, and discount rate news from our VAR model. Panel B contains the coefficients from the SIO model. Across each size quintile, we find that SIO consistently exhibits an asymmetric reaction to negative cash flow news. For the smallest group of firms, short term institutions sell 1.1 percent less (.036 - .025) on negative cash flow news relative to positive cash flow news. For the largest group, SIOs sell 5.5 percent less (.100 - .045) on negative cash flow news relative to positive cash flow news. We find similar results for the LIO group in the smallest quintile. LIOs sell .6 percent less (.012 - .006) for small firms on negative cash flow news. However, for the largest firms, we find that LIOs actually purchase 8.1 percent more (.038 + .043) on negative cash flow news relative to positive cash flow news. In Panel D we report the means tested differences between Panel B and Panel C for the respective cells.

The coefficients on n_cf reveal an interesting trading behavior between the SIO and LIO groups. For the two largest quintiles of firms, the coefficients on n_cf for SIO and LIO are of similar magnitude, but opposite direction. This suggest that the two groups may trade with each other given their differing roles in capital markets.

3.7 Portfolio Allocations

In Table VIII, we examine the portfolio allocations of investors by regressing different types of aggregate level ownerships on (i) a CRSP value-weighted portfolio that is funded by shorting T-bills, as well as (ii) two additional zero-cost portfolios as our test assets: the first is based on estimated cash flow news, which is long stocks that have had positive cash flow news in the past and short stocks that have had negative cash flow news (we refer to this as the CF news portfolio); the second is based on estimated discount rate news, which is long stocks

that have had positive discount rate news and short stocks that have had negative discount rate news (the DR news portfolio).

Similar to Cohen et al.'s (2002) construction of their cash flow news portfolio, we normalize the sums of long weights in both our CF news portfolio and DR news portfolio to one. Additionally, given that market-adjusted news average to zero in each cross-section, the portfolio weights sum up to zero. Here, the CF and DR news are estimated through a rolling VAR system that incorporates only past information on returns, profitability, book-to-market, and various ownership types. The data for the system begins in 1980, when institutional holdings coverage from the TFN 13F file becomes available. The aggregate level ownership $O_{i,\kappa,t}$ of a firm i by a certain type of investor κ (e.g., institutions, individuals, etc.) in year t is defined as the market value of i's equity held by type κ investors scaled by the market value of κ's portfolio, i.e.,

$$O_{i,\kappa,t} = \frac{\text{MVE}_{i,\kappa,t}}{\sum_{i \in I} \text{MVE}_{i,\kappa,t}}. \tag{11}$$

For each year t, we set the weightings that define the two test assets equal to the estimated value of the year $t-1$ market-adjusted news.

Models 1, 2, 3, and 4 show results for all institutional investors (TIO), short-term institutional investors (SIO), long-term institutional investors (LIO), and individual investors, respectively. In Model 1, we find that institutions as a group assign a 95.1% weight on the market, 0.4% on the CF news portfolio, and 0.8% on the DR news portfolio. In contrast, Model 4 shows that individual investors short both the CF and DR news portfolios. In Models 2 and 3, we find heterogeneous allocations among short-term and long-term institutions. Specifically, the former longs the CF news portfolio and shorts the DR news portfolio, the latter does the opposite. The estimated coefficients of the CF and DR news portfolio are 4.9% and -1.6% (-1.8% and 1.8%) for the holdings estimation of short-term

(long-term) institutional investors. All estimated coefficients are statistically significant at the 1% level.

These results are consistent with our earlier findings. As a whole, institutions take long positions on both the CF news and DR news portfolios, and individuals take short positions. Importantly, SIO (LIO) is the primary driving force behind the positive estimated coefficient for CF news (DR news) in Model 1.

4 Robustness checks

In this section, we present the robustness checks of our main results and additional discussions. Second, one may argue that the cash flow and discount rate news estimation procedure is sensitive to the VAR specification and the estimation method. To alleviate these concerns we implement the battery of robustness checks where we use alternative specifications and estimations procedures.

4.1 Bushee Institutional Investor Classification

As an alternative to the SIO and LIO classification from Yan and Zhang (2009), we also employ the institutional classification scheme from Bushee (2001) to examine institutional preferences for cash flow news and discount rate news. This scheme classifies institutional owners into three classes based on their preference for near by or long run expected earnings. The transient (TRA) class consists of institutions that invest in firms with relatively higher near by expected earnings. The quasi-index (QIX) class consists of institutions that have a broad portfolio and invest for capital appreciation or dividend income. The dedicated (DED) class consists of institutions that have a concentrated portfolio and invest for long run capital appreciation and engage with firms as active monitors. Based on these classifications, we anticipate that the transient class of institutions will invest (divest) on positive (negative)

cash flow news. And, we anticipate that the dedicated class of institutions will invest (divest) on positive (negative) discount rate news.

For this analysis, we obtain the Bushee (2001) classification for institutions in our sample from Brian Bushee's website. We reestimate the VAR model, cash flow news, and discount rate news after replacing the market adjusted institutional ownership state variables (SIO, LIO, TIO) with market adjusted institutional ownership state variables based on the Bushee classification (DED, QIX, TRA). We present summary statistics of the Bushee classifications along with the correlations between the two classification sets in Table IX.

We begin our robustness analysis by modeling the relationship between returns and cash flow news, and institutional ownership and both cash flow news and discount rate news. We report the results in Table X. This analysis is similar to our models in Table IV. In Panel A of Table X we find an over reaction to cash flow news of approximately 5 cents for a one dollar cash flow news shock over our sample. In Panel B we model QIX institutional ownership response to cash flow news and discount rate news. We find that QIX institutional ownership increases significantly with cash flow news (.111, t-stat = 4.024) and discount rate news (.18, t-stat = 1.842). In Panel C, we find that TRA ownership increases with cash flow news (.18, t-stat 5.256) and decreases with discount rate news (-.641, t-stat = -4.179). Panel D shows that DED ownership decreases on cash flow news (-.104, t-stat = -2.492) and increases on discount rate news (.558, t-stat = 2.965).

Next, we model the DED, QIX, and TRA investor preferences for cash flow and discount rate news by regressing next year's institutional ownership level on cash flow news, discount rate news, and the same control set from the models in Table V, using the Fama and MacBeth (1973) methodology. We present the results of these models in Table XI. In Column 1 of Table XI the dependent variable is the following year's DED institutional ownership. Consistent with our hypothesis and results in Table V, we find that the dedicated investors exhibit higher ownership following positive discount rate news. The coefficient on DR News in Column 1 is .023 (t-stat = 3.36). The coefficient on CF News in Column 1 is negative and

but insignificant (-.013, t-stat = -.55). In Columns 2 and 3 we report the results for QIX and TRA institutional ownership, respectively. For each of these groups, positive cash flow news significantly predicts future QIX (.042, t-stat = 7.04) and TRA (.091, t-stat = 6.09) ownership levels. We also find that both of these groups have lower holdings around positive discount rate news, (-.012, t-stat = -1.82; -.013, t-stat = -1.82). Taken together, these results lend support to our overarching hypothesis that short term institutional owners (SIO and TRA) respond to cash flow news, while long term institutional (LIO and DED) owners buy on discount rate news.

4.2 Other Robustness

We run multiple robustness checks to make sure that our results are not sensitive to the VAR specification and the estimation procedure.

To make sure that our findings are not sensitive to the VAR specification we repeat our main results using a different VAR specification. Specifically, in addition to the main variables included in VAR such as return, book-to-market ratio, and profitability we also include the levels of short-term and long-term ownership however we do not include the total institutional ownership in the system. The results continue to show a strong reaction of institutions to aggregate news. While SIO is tend to be more sensitive to the cash flow news, LIO investors react more to the discount-rate news.

To ensure that our results are not driven the estimation methodology we repeat our main set of test (Table 4) using different estimation procedures. In particular, we follow Petersen (2009) and Gow et al. (2010) and use pooled OLS regressions with two-way clustered errors that adjust for cross-sectional and time-seriens effects rather than cross-sectional Fama and MacBeth (1973) regressions. Petersen (2009) present evidence that a simple OLS, Fama and MacBeth (1973), and Newey and West (1987) standard errors can be potentially downward biased leading to over rejections issures. According to untabulated results, this analysis

continues to show that short-term and long-term institutions exhibit a significantly different reaction to discount rate and cash flow news.

5 Conclusions

Prior literature shows that market underreacts to the cash flow news, especially among relatively small companies (Vuolteenaho, 2002; Cohen et al., 2002). In this paper, we further explore the reaction to cash flow and discount-rate news of institutional investors. In particular, we study trading patterns of the short-term and long-term institutional investors in response to the news. To sum, our analysis points to three conclusions. First, we find that under reaction to the cash flow news is declining over time suggesting that the market becomes more efficient over time. In our sample, the under-reaction effect is 15 cents vs 41 cents in the Cohen et al. (2002) study.

Second, we observe that the primary reason for the decrease in the under reaction to cash flow new is trading short-term institutions. While we also find that long-term institutions increase their holdings in response to the positive cash flow news, the reaction of the short-term ownership is substantially higher. This is especially pronounced among small stocks, where the under reaction is mainly observed.

Third, according to our results, the institutional horizon is an important determinant on the investors' reaction to the news. We document that the trading patterns of the short and long-term institutions in response to cash-flow and discount-rate news are different. Overall, short- (long-) term institutions are primarily focused on cash flow (discount rate) news, which is consistent with their horizons.

Our study sheds light on the understanding of the within-group heterogeneity of investor responses to cash-flow news. While institutions as a group exploit the under-reaction phenomenon, we identify an important dimension in differentiating these large investors that allows us to further understand their reaction to new information in the market.

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A Appendix

A.1 Variable Definitions

RET	Annual returns, computed by compounding monthly returns recorded from the beginning of July to the end of June.
MVE	Market value of equity taken from CRSP as of the end of June. If the year t market equity is missing, we compound the lagged market equity with return without dividends.
BVE	Book value of equity calculated based on COMPUSTAT. We prefer `ceq`, but if it is unavailable we use `ceql`. Also, if short- and/or long-term deferred taxes are available (`txp, txditc`), we add them to book equity. If both `ceq` and `ceql` are missing, we proxy book equity by the last period's book equity plus earnings (`ib`) less dividends (`dvt`). We treat negative or zero book equity values as missing.
ROE	Earnings over the last period's book equity, measured according to US GAAP. For earnings, we use the `ni` variable; where `ni` is missing, we compute earnings as the change in book equity plus dividends. Following Cohen et al. (2002) we do not allow the firm to lose more than its book equity (i.e. we define earnings as the maximum of reported net income and negative of the beginning of the period book equity). This effectively means that the minimum ROE is truncated to -100%.
B/M	Book value of equity (BVE) divided by market value of equity (MVE).
TIO	Total institutional ownership measured as of the end of June; this is calculated as the number of shares held by institutional investors divided by the total number of shares outstanding for each stock.
SIO	Short-term institutional ownership. Following Yan and Zhang (2009), we classify an institutional investor as a short-term investor if its past four-quarter turnover rate ranks in the top tercile.
LIO	Long-term institutional ownership. Following Yan and Zhang (2009), we classify an institutional investor as a long-term investor if its past four-quarter turnover rate ranks in the bottom tercile.
Age	Firm age measured as number of months since first return appears in the CRSP database.
DY	Dividend yield is calculated as the difference between returns including dividends and returns without dividends from CRSP (`ret` and `retx`, respectively). Monthly dividend yields are cumulated from beginning of July to the end of June for a yearly dividend yield.
Price	Stock price coming from CRSP (`prc`).
Turnover	Monthly turnover is calculated as total shares traded (`vol`) divided by total shares outstanding (`shrout`). At an annual level, we consider the average monthly turnover from beginning of July to the end of June.
SP500	Dummy variable for S&P500 index membership.
DED	Dedicated institutional ownership measured at of the end of June; this is calculated as the number of shares held by dedicated investors from the Bushee (2001) classification divided by the total number of shares outstanding for each stock.
QIX	Quasi-indexer institutional ownership measured at of the end of June; this is calculated as the number of shares held by quasi-indexer investors from the Bushee (2001) classification divided by the total number of shares outstanding for each stock.
TRA	Transient institutional ownership measured at of the end of June; this is calculated as the number of shares held by transient investors from the Bushee (2001) classification divided by the total number of shares outstanding for each stock.

Table I: **Descriptive Statistics**

This table shows the descriptive statistics of the variables used in the study. Panel A reports means, standard deviations, and percentiles of the main variables used in this study. Panel B reports the contemporaneous correlations and Panel C the first-order cross- and autocorrelations of market-adjusted (i.e. cross-sectionally demeaned) variables. Definition and construction details for each variable can be found in the appendix. The annual dataset contains 82,760 observations and covers the period from 1983 to 2013. The descriptive statistics are estimated from pooled data.

Panel A: Descriptive Statistics

Variable	Mean	St.Dev.	Min	P25	Median	P75	Max
ln(RET)	0.0330	0.4290	-2.2738	-0.1660	0.0701	0.2690	2.9349
ln(ROE)	-0.0088	0.4180	-2.3024	0.0042	0.0842	0.1418	3.9191
ln(B/M)	-0.3263	0.8481	-2.3019	-0.8343	-0.3924	0.0454	6.1600
TIO	0.3776	0.2831	0.0000	0.1204	0.3402	0.6078	0.9998
SIO	0.0853	0.0932	0.0000	0.0105	0.0566	0.1290	0.9236
LIO	0.1235	0.1155	0.0000	0.0299	0.0946	0.1883	0.9584

Panel B: Contemporaneous Correlations (market adjusted data)

	ln(RET)	ln(ROE)	ln(B/M)	TIO	SIO	LIO
ln(RET)	1	0.2391	-0.3063	0.1268	0.1652	0.0718
ln(ROE)	0.2391	1	0.0982	0.1513	0.0503	0.1418
ln(B/M)	-0.3063	0.0982	1	-0.2503	-0.2361	-0.1551
TIO	0.1268	0.1513	-0.2503	1	0.6761	0.7536
SIO	0.1652	0.0503	-0.2361	0.6761	1	0.2589
LIO	0.0718	0.1418	-0.1551	0.7536	0.2589	1

Panel C: Cross- and Autocorrelations (market adjusted data)

	$\ln(\text{RET}_t)$	$\ln(\text{ROE}_t)$	$\ln(\text{B/M}_t)$	TIO_t	SIO_t	LIO_t
$\ln(\text{RET}_{t-1})$	0.0448	0.2269	-0.1861	0.0968	0.1144	0.0462
$\ln(\text{ROE}_{t-1})$	0.1154	0.6262	0.1151	0.1314	0.0200	0.1323
$\ln(\text{B/M}_{t-1})$	0.0664	0.0539	0.8627	-0.2324	-0.1998	-0.1419
$\ln(\text{TIO}_{t-1})$	0.0421	0.1362	-0.2090	0.8306	0.5237	0.6496
$\ln(\text{SIO}_{t-1})$	-0.0094	0.0487	-0.1805	0.5544	0.6860	0.2246
$\ln(\text{LIO}_{t-1})$	0.0593	0.1304	-0.1370	0.6263	0.1994	0.7843

Table II: **VAR Parameter Estimates**

This table presents results from a first order vector autoregressive (VAR) system from the annual panel that is used for decomposing unexpected stock return into a cash flow component and a discount rate component (Campbell, 1991; Cohen et al., 2002; Vuolteenaho, 2002). The system integrates information from shocks to stock return, profitability, book-to-market, and total, short-term, and long-term institutional ownerships (i.e., the model state variables) to cash flow news and takes the following functional form:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t},$$

where $z_{i,t}$ is the vector of firm-specific variables that describe firm i at time t. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level. The sample period is from 1983 to 2013.

	RET_{t-1}	B/M_{t-1}	ROE_{t-1}	SIO_{t-1}	LIO_{t-1}	TIO_{t-1}
RET_t	0.070***	0.046***	0.089***	-0.166***	0.099***	0.097***
B/M_t	0.121***	0.894***	0.037***	0.231***	-0.168***	-0.092***
ROE_t	0.161***	0.016***	0.599***	-0.138***	0.033*	0.112***
SIO_t	0.007***	-0.002***	-0.004***	0.565***	-0.087***	0.081***
LIO_t	0.005***	-0.003***	0.006***	-0.137***	0.624***	0.119***
TIO_t	0.018***	-0.012***	0.014***	-0.033***	0.037***	0.845***

Table III: **Double Sorts on CF News and DR News**

This table presents results from an independent double sort on cash flow (CF) news and discount rate (DR) news, which are derived from the VAR system in Table II, which integrates information from shocks to stock return, profitability, book-to-market, and total, short-term, and long-term institutional ownerships (i.e., the model state variables) to CF news and takes the following functional form:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t},$$

where $z_{i,t}$ is the vector of firm-specific variables that describe firm i at time t. Panels A and B show the mean contemporaneous changes in short-term institutional ownership (SIO) and long-term institutional ownership (LIO), respectively, in each of the corresponding cells. Panel C reports the differences between SIO and LIO for each cell. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

Panel A: SIO

CF News Quintiles	DR News Quintiles Bottom	2nd	3rd	4th	Top	DIFF DR
Bottom	-0.92***	-0.48***	-0.52***	-0.71***	-0.91***	0.01
	(-11.13)	(-6.77)	(-6.80)	(-8.72)	(-10.08)	(0.08)
2nd	-0.02	-0.02	-0.29***	-0.43***	-0.64***	-0.63***
	(-0.21)	(-0.41)	(-5.79)	(-9.24)	(-9.83)	(-4.87)
3rd	0.38***	0.07	-0.16***	-0.20***	-0.43***	-0.81***
	(3.74)	(1.62)	(-4.26)	(-3.14)	(-4.84)	(-4.65)
4th	0.72***	0.28***	-0.01	-0.07	-0.04	-0.75***
	(5.84)	(4.14)	(-0.14)	(-1.24)	(-0.47)	(-5.09)
Top	1.48***	1.11***	0.99***	0.90***	1.17***	-0.31
	(9.52)	(8.71)	(9.16)	(8.11)	(10.18)	(-1.48)
Diff CF	2.40***	1.60***	1.51***	1.61***	2.08***	
	(14.16)	(9.10)	(9.61)	(9.66)	(17.73)	

Panel B: LIO

CF News Quintiles	DR News Quintiles Bottom	2nd	3rd	4th	Top	DIFF DR
Bottom	-1.53***	-0.74***	-0.50***	-0.29***	0.15**	1.68***
	(-8.74)	(-13.26)	(-9.94)	(-5.81)	(2.25)	(8.49)
2nd	-1.16***	-0.66***	-0.25***	0.29***	1.08***	2.24***
	(-15.33)	(-15.00)	(-6.61)	(4.85)	(10.86)	(16.13)
3rd	-1.08***	-0.57***	0.01	0.55***	1.44***	2.52***
	(-16.76)	(-12.82)	(0.16)	(7.63)	(13.72)	(16.48)
4th	-1.03***	-0.44***	0.15***	0.73***	1.67***	2.70***
	(-11.92)	(-10.54)	(3.26)	(9.48)	(14.74)	(14.24)
Top	-0.61***	-0.15***	0.23***	0.74***	2.18***	2.79***
	(-11.72)	(-5.20)	(6.24)	(10.83)	(9.04)	(11.00)
Diff CF	0.92***	0.58***	0.74***	1.03***	2.03***	
	(5.03)	(8.91)	(11.12)	(11.54)	(7.68)	

Panel C: SIO-LIO

CF News Quintiles	DR News Quintiles Bottom	2nd	3rd	4th	Top	DIFF DR
Bottom	0.61***	0.25**	-0.01	-0.42***	-1.06***	-1.67***
	(4.29)	(2.58)	(-0.13)	(-4.28)	(-9.61)	(-11.14)
2nd	1.14***	0.63***	-0.04	-0.72***	-1.72***	-2.86***
	(10.01)	(8.72)	(-0.55)	(-8.58)	(-13.46)	(-13.53)
3rd	1.46***	0.64***	-0.16***	-0.75***	-1.87***	-3.33***
	(12.12)	(10.46)	(-3.47)	(-9.19)	(-13.81)	(-14.26)
4th	1.75***	0.72***	-0.16***	-0.80***	-1.71***	-3.46***
	(10.06)	(8.42)	(-3.00)	(-8.32)	(-13.84)	(-13.36)
Top	2.09***	1.26***	0.76***	0.15	-1.01***	-3.10***
	(11.60)	(8.92)	(6.14)	(1.26)	(-4.72)	(-11.67)
Diff CF	1.48***	1.01***	0.77***	0.58***	0.05	
	(5.74)	(5.07)	(4.07)	(2.81)	(0.20)	

Panel D: Average Number of Obs in Each Cross-Section

CF News Quintiles	DR News Quintiles Bottom	2nd	3rd	4th	Top
Bottom	219	72	60	75	107
2nd	93	106	116	123	96
3rd	62	118	140	129	85
4th	64	128	129	122	91
Top	96	110	89	84	155

Table IV: **Returns and IO Regressions on CF News and DR News**

This table presents Fama-MacBeth regression coefficient estimates of stock return and institutional ownership on cash flow (CF) and discount rate (DR) news. The news variables are derived from the market-adjusted VAR system in Table II, which integrates information from shocks to stock return, profitability, book-to-market, and total, short-term, and long-term institutional ownerships (i.e., the model state variables) to CF news and takes the following functional form:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t},$$

where $z_{i,t}$ is the vector of firm-specific variables that describe firm i at time t. Panel A regresses stock-return shocks on CF news. Panels B, C, and D model total institutional ownership shocks, short-term institutional ownership shocks, and long-term institutional ownership shocks, respectively. The shocks are modeled either as a function of CF news alone (Model 1), or as a function of both CF news and DR news (Model 2). * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

Panel A: Returns		
	Model 1	
CF News	0.825***	
	(61.724)	
Intercept	-0.000	
	(-0.532)	
Adj. R2	0.796***	

Panel B: TIO		
	Model 1	Model 2
CF News	0.120***	0.075***
	(5.427)	(16.359)
DR News		0.225***
		(2.848)
Intercept	0.000	0.000
	(0.687)	(1.302)
Adj R2	0.130***	0.213***

Panel C: SIO		
	Model 1	Model 2
CF News	0.043***	0.045***
	(13.669)	(8.521)
DR News		-0.017
		(-0.849)
Intercept	0.000	0.000
	(0.658)	(0.866)
Adj R2	0.073***	0.089***

Panel D: LIO		
	Model 1	Model 2
CF News	0.032***	0.010***
	(3.361)	(2.737)
DR News		0.116***
		(4.943)
Intercept	0.000	0.000
	(0.571)	(0.769)
Adj R2	0.043**	0.138***

Table V: **Institutional Investor Preferences for CF News and DR News**

This table presents Fama-MacBeth regression coefficient estimates of institutional ownership levels on cash-flow and discount-rate news. The news variables are derived from the market-adjusted VAR system in Table II, which integrates information from shocks to stock return, profitability, book-to-market, and total, short-term, and long-term institutional ownerships (i.e., the model state variables) to CF news and takes the following functional form:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t},$$

where $z_{i,t}$ is the vector of firm-specific variables that describe firm i at time t. Models 1, 2, and 3 report estimations of firm-level total institutional ownership (TIO), short-term institutional ownership (SIO), and long-term institutional ownership (LIO), respectively. All models control for firm level determinants of institutional holdings (Gompers and Metrick, 2001; Yan and Zhang, 2009). Due to collinearity concerns, cash-flow news and market cap are orthogonalized. All parameter estimates are reported using standardized coefficients. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level. The sample period is from 1983 to 2013.

	Model 1 Lead TIO	Model 2 Lead SIO	Model 3 Lead LIO
CF News (Orthog)	0.113***	0.159***	0.043***
	(20.81)	(13.29)	(8.53)
DR News	0.104***	-0.013**	0.128***
	(7.36)	(-2.06)	(8.85)
Ln(MVE) (Orthog)	0.582***	0.358***	0.472***
	(16.10)	(12.20)	(12.09)
Age	0.011*	-0.047***	0.082***
	(1.91)	(-3.67)	(6.01)
Book-to-Market	0.001	0.018	-0.001
	(0.12)	(1.05)	(-0.11)
Dividend Yield	-0.112***	-0.135***	-0.034***
	(-5.98)	(-6.64)	(-6.63)
Price	0.692	0.753	0.414
	(0.93)	(0.94)	(0.91)
Turnover	0.198***	0.571***	-0.118**
	(3.87)	(3.48)	(-2.50)
SP500	-0.046	-0.089***	0.007
	(-1.56)	(-3.37)	(0.21)
Adj. R2	0.44	0.24	0.33
N	67522	67522	67522

Table VI: **Size Groups**

This table shows total market, SIO, and LIO reaction to cash flow and discount rate news across the firm size spectrum. We split the sample into quintiles based on the market value of the equity of each firm, and reestimate the VAR model in equation (2) assuming different transition matrices and error covariance matrices for each group. We construct all variables before. In Panel A we report the coefficient of returns regressed on cash flow news (b(r,cf)) to capture the sensitivity of excess returns to cash flow news. In Panel B we report the coefficients of SIO regressed on cash flow news (b(sio,cf)) and discount rate news (b(sio,dr)), and LIO regressed on cash flow news (b(lio,cf)) and (b(lio,dr)). In Panel B we also report the means tested differences between the SIO and LIO coefficients for cash flow news and discount rate news, respectively. All coefficients are based on the Fama and MacBeth (1973) cross sectional methodology. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level. The sample period is from 1983 to 2013.

	Panel A	*Panel B*			
Size Quintle	b(r,cf)	b(sio,cf)	b(sio,dr)	b(lio,cf)	b(lio,dr)
Small	0.831***	0.023***	-0.029***	0.009***	0.005**
2	0.837***	0.044***	-0.055***	0.015***	0.030***
3	0.958***	0.053***	-0.103***	0.014***	0.091***
4	0.962***	0.053***	-0.136***	0.010**	0.123***
Big	1.041***	0.076***	0.031	0.057***	0.323***
Small - Big	-.210***	-.053***	-0.060***	-0.048***	-0.318***

Table VII: **Response to Bad News**

This table shows the asymmetric reaction to cash flow news by the total market, SIO, and LIO across the size spectrum. We split the sample into quintiles based on the market value of the equity of each firm, and reestimate the VAR model in equation (2) assuming different transition matrices and error covariance matrices for each group. We construct all variables before with the addition of negative cash flow news (n_cf) which is equal to zero for positive values of cash flow news and cash flow news otherwise. Panel A contains the coefficients from the regression of excess returns on cash flow news (b(r,cf)) and negative cash flow news (b(r,n_cf)). Panel B contains the coefficients from the regression of SIO on cash flow news (b(sio,cf)), negative cash flow news (b(sio,n_cf)), and discount rate news (b(sio,dr)). Panel B contains the coefficients from the regression of LIO on cash flow news (b(lio,cf)), negative cash flow news (b(lio,n_cf)), and discount rate news (b(lio,dr)). Panel D contains the means tested differences for the respective cells in Panel B and Panel C. All coefficients are based on the Fama and MacBeth (1973) cross sectional methodology. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level. The sample period is from 1983 to 2013.

	Panel A		*Panel B*			*Panel C*			*Panel D*		
Size Quintle	b(r,cf)	b(r,n_cf)	b(sio,cf)	b(sio,n_cf)	b(sio,dr)	b(lio,cf)	b(lio,n_cf)	b(lio,dr)	*Panel B - Panel C*		
Small	1.016***	-0.330***	0.036***	-0.025***	-0.025***	0.012***	-0.006**	0.006***	0.024***	-0.019***	-0.031***
2	0.941***	-0.184***	0.071***	-0.050***	-0.049***	0.015***	-0.000	0.031***	0.056***	-0.050***	-0.080***
3	1.015***	-0.097***	0.078***	-0.047***	-0.100***	0.011*	0.008	0.091***	0.067***	-0.055***	-0.191***
4	1.005***	-0.069**	0.066***	-0.025*	-0.137***	-0.001	0.023***	0.124***	0.067***	-0.048***	-0.261***
Big	1.048***	-0.006	0.100***	-0.045***	0.033	0.038***	0.043***	0.324***	0.062***	-0.088***	-0.291***

Table VIII: **Portfolio Allocations**

This table examines the portfolio allocations of investors by regressing different types of aggregate level ownerships on (i) a CRSP value-weighted portfolio that is funded by shorting T-bills, as well as (ii) two additional zero-cost portfolios as test assets: the first is based on estimated cash flow news, which is long stocks that have had positive cash flow news in the past and short stocks that have had negative cash flow news (i.e., the CF news portfolio); the second is based on estimated discount rate news, which is long stocks that have had positive discount rate news and short stocks that have had negative discount rate news (the DR news portfolio). The sums of long weights in both the CF news portfolio and the DR news portfolios are normalized to one. The CF and DR news are estimated through a rolling VAR system that incorporates only past information on returns, profitability, book-to-market, and various ownership types. The aggregate level ownership $O_{i,\kappa,t}$ of a firm i by a certain type of investor κ (e.g., institutions, individuals, etc.) in year t is defined as the market value of i's equity held by type κ investors scaled by the market value of κ's portfolio, i.e.,

$$O_{i,\kappa,t} = \frac{\text{MVE}_{i,\kappa,t}}{\sum_{i \in I} \text{MVE}_{i,\kappa,t}}.$$

For each year t, the weights that define the two test assets equal to the estimated value of the year $t-1$ market-adjusted news. Models 1, 2, 3, and 4 show results for all institutional investors (TIO), short-term institutional investors (SIO), long-term institutional investors (LIO), and individual investors, respectively. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

	Model 1 All Institutions	Model 2 Short-Term Institutions	Model 3 Long-Term Institutions	Model 4 Individuals
Weight on CRSP VW	0.951***	0.705***	1.097***	1.062***
	(85.40)	(39.52)	(75.15)	(72.74)
Weight on NCF	0.004***	0.049***	-0.018***	-0.004***
	(2.41)	(10.87)	(-7.64)	(-2.21)
Weight on NDR	0.008***	-0.016***	0.018***	-0.011***
	(3.33)	(-4.36)	(4.96)	(-3.53)
Intercept	0.000***	0.000***	0.000***	0.000***
	(4.87)	(17.59)	(-4.92)	(-4.77)
Adj-R2	0.923	0.720	0.914	0.921

Table IX: **Bushee Sample Summary Statistics**

This table presents the correlations matrix between our main measures of short run, long run, and total institutional ownership and the alternative institutional ownership measures dedicated, transient, and quasi-indexer.

	Mean	Std. Dev.	N	Corr(DED)	Corr(QIX)	Corr(TRA)
DED	0.018	0.052	19196	1.000	-0.066	-0.015
QIX	0.053	0.036	19196	-0.066	1.000	0.105
TRA	0.024	0.027	19196	-0.015	0.105	1.000
SIO	0.120	0.092	19196	-0.035	0.084	0.392
LIO	0.182	0.107	19196	0.242	0.288	-0.027
TIO	0.535	0.225	19196	0.108	0.338	0.277
CF News	0.000	0.000	19196	-0.031	0.002	0.076
DR News	0.000	0.000	19196	0.044	0.027	-0.101
Ln(MVE)	14.302	1.692	19196	-0.135	0.280	0.018
Dividend Yield	0.023	0.030	19196	-0.075	-0.066	-0.214
Book-to-Market	0.717	0.603	19196	0.028	-0.086	-0.077
Price	99.523	2392.506	19196	-0.007	-0.025	-0.019
Turnover	0.119	0.133	19196	-0.035	0.198	0.402
SP500	0.396	0.489	19196	-0.097	0.200	-0.074

Table X: **Returns and IO Regressions on CF News and DR News Using Bushee Classification**

This table presents Fama-MacBeth regression coefficient estimates of stock return and institutional ownership on cash flow (CF) and discount rate (DR) news. The news variables are derived from the market-adjusted VAR system in Table II, which integrates information from shocks to stock return, profitability, book-to-market, and total, short-term, and long-term institutional ownerships (i.e., the model state variables) to CF news and takes the following functional form:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t},$$

where $z_{i,t}$ is the vector of firm-specific variables that describe firm i at time t. Panel A regresses stock-return shocks on CF news. Panels B, C, and D model quasi-indexer institutional ownership shocks, transient institutional ownership shocks, and dedicated institutional ownership shocks, respectively. The shocks are modeled either as a function of CF news alone (Model 1), or as a function of both CF news and DR news (Model 2). * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

Panel A: Returns	
	Model 1
CF News	1.054***
	(70.906)
DR News	
Intercept	0.000
	(0.169)
Adj. R2	0.896***

Panel B: QIX		
	Model 1	Model 2
CF News	.097***	.111***
	(3.027)	(4.025)
DR News		.188*
		(1.842)
Intercept	-0.001	-0.001
	(-0.788)	(-0.837)
Adj. R2	0.007***	0.009***

Panel C: TRA		
	Model 1	Model 2
CF News	.216***	.184***
	(5.297)	(5.256)
DR News		-.641***
		(-4.179)
Intercept	0.000	0.000
	(0.561)	(0.575)
Adj. R2	0.018***	0.033***

Panel D: DED		
	Model 1	Model 2
CF News	-.127***	-.104**
	(-3.744)	(-2.492)
DR News		.558***
		(2.965)
Intercept	-0.001	-0.001
	(-1.247)	(-1.255)
Adj. R2	0.010***	0.017***

Table XI: **Bushee Classification Preferences for CF News and DR News**

This table presents Fama-MacBeth regression coefficient estimates of institutional ownership levels on cash flow and discount rate news. The news variables are derived from the market-adjusted VAR system in Table II, which integrates information from shocks to stock return, profitability, book-to-market, and dedicated, quasi-indexer, and transient institutional ownerships (i.e., the model state variables) to CF news and takes the following functional form:

$$z_{i,t} = \Gamma z_{i,t-1} + u_{i,t},$$

where $z_{i,t}$ is the vector of firm-specific variables that describe firm i at time t. Models 1, 2, and 3 report estimations of firm-level dedicated (DED), quasi-indexer (QIX), and transient (TRA), respectively. All models control for firm level determinants of institutional holdings (Gompers and Metrick, 2001; Yan and Zhang, 2009). Due to collinearity concerns, cash flow news and market cap are orthogonalized. All parameter estimates are reported using standardized coefficients. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level. The sample period is from 1983 to 2013.

	Model 1 Lead DED	Model 2 Lead QIX	Model 3 Lead TRA
CF News (Orthog)	-0.012	0.042**	0.070***
	(-0.55)	(2.50)	(4.98)
DR News	0.109***	0.016	-0.061***
	(3.33)	(1.05)	(-4.51)
Ln(MVE) (Orthog)	-0.151***	0.156***	-0.012
	(-3.79)	(6.87)	(-0.51)
Age	-0.017	-0.004	-0.011
	(-1.06)	(-0.30)	(-1.45)
Book-to-Market	0.001	-0.038***	0.031***
	(0.04)	(-2.94)	(2.86)
Dividend Yield	-0.092***	-0.022	-0.110***
	(-2.90)	(-1.10)	(-4.62)
Price	2.844**	-0.309	0.282
	(2.43)	(-1.05)	(0.44)
Turnover	-0.154***	0.096**	0.321***
	(-3.76)	(2.48)	(5.05)
SP500	-0.083*	0.047	-0.035
	(-2.00)	(0.79)	(-1.16)
Adj. R2	0.10	0.12	0.13
N	13322	17759	17334