Institutional Trade Persistence and Long-term Equity Returns

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ABSTRACT

Recent studies show that single-quarter institutional herding positively predicts short-term returns. Motivated by the theoretical herding literature, which emphasizes endogenous persistence in decisions over time, we estimate the effect of multi-quarter institutional buying and selling on stock returns. Using both regression and portfolio tests, we find that persistent institutional trading negatively predicts long-term returns: persistently sold stocks outperform persistently bought stocks at long horizons. The negative association between returns and institutional trade persistence is not subsumed by past returns or other stock characteristics, is concentrated among smaller stocks, and is stronger for stocks with higher institutional ownership.

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A growing literature on the trading behavior of institutional money managers shows that they exhibit a tendency to herd, that is, to imitate each others' trades. Given the increasing prevalence of such investors in financial markets, the potential price impact of institutional herding is of great interest. Institutional herding behavior is generally found to have a stabilizing effect on prices. Several well-known studies find a positive correlation between the direction of institutional herding and future stock returns, thus concluding that institutional trading pushes prices towards equilibrium values. For example, Wermers (1999) shows that stocks heavily bought by mutual funds during a given quarter outperform stocks heavily sold by funds in that quarter, over the subsequent six months. Sias (2004) finds that institutional demand is positively correlated over adjacent quarters and is positively related to returns over the following year.[1]

These studies use quarterly data to focus on short-term institutional herding measured over one or two quarters, that is, they measure herding by the extent to which institutions buy or sell the same stock in the same or adjacent periods of time. In this paper we focus on the price impact of institutional trading when institutions persistently buy or sell the same stock over multiple time periods. While the analysis of single or adjacent-period herding is of significant interest, theoretical models of herding are fundamentally dynamic (e.g., Bikhchandani, Hirshleifer, and Welch (1992) or Scharfstein and Stein (1990)). In these models, when agents select a particular action over multiple periods, other agents imitate their choice, creating persistence in decisions over time. Since herding leads to persistence, the price impact of herding in financial markets may be identified by focusing on persistent trading decisions. Motivated by this insight, we analyze institutional trading decisions that persist over several quarters and examine the price impact of such trading persistence on the cross-section of stock returns.

We show that persistence in institutional trading has significant power to predict the cross-section of stock returns at long horizons, after controlling for past returns and other variables that are known to predict returns. Institutional trade persistence is associated with reversals in returns. Stocks that are persistently sold by institutions over three to five quarters outperform stocks that are persistently bought by them after a period of about two years. Thus, our long-term results complement the existing literature on the short-term price impact of institutional herding.

Our empirical analysis is based on a sample of quarterly observations on the stock holdings of U.S. institutional portfolio managers between 1983 and 2004. We measure the buy and sell persistence of institutional trading by the number of consecutive quarters in which a stock is bought or sold by institutions as an aggregate.

Our cross-sectional regression tests reveal that the persistence of institutional trading is negatively related to stock returns at long horizons. The predictability associated with institutional trade persistence is economically important and statistically significant, even after we control for a wide variety of other factors known to predict long-term returns. We include past four-year returns and past three-year returns measured skipping a year to control for the stylized patterns of return reversals previously documented by DeBondt and Thaler (1985). We also control for a number of other stock characteristics like market capitalization, institutional ownership, and share turnover. Since value stocks typically exhibit return reversals, we include book-to-market in our regression specification, as well as several other variables that capture the value characteristics of a company (earnings-to-price ratio, cash flow-to-price ratio, sales-to-price ratio, and past earnings growth). In addition, we control for the reversal effect related to a company's share issuance or repurchase activity as documented in Daniel and Titman (2006). Finally, we control for changes in analyst coverage. While some of these controls significantly predict long-term returns, the negative association between institutional trade persistence and long-term returns remains strongly significant and is robust to all of them.

The impact of institutional trade persistence on stock returns is particularly strong for stocks that are mostly owned by institutional investors. In the first half of our sample period (1983 to 1993), stocks with higher than average institutional ownership experience significant return reversals associated with persistent institutional trading. In the more recent half of the sample period (1994 to 2004) the effect of institutional trade persistence on returns is unconditionally negative and significant, suggesting that the reversal effect associated with trade persistence is strong even for stocks with an average level of institutional ownership. At an intuitive level, this finding could be explained in the light of the unprecedented growth in the delegated portfolio management industry witnessed by financial markets during our sample period. The second half of the sample

is characterized by an increase in average institutional ownership, and thus institutional trading in the average stock is likely to be higher than that in the first half of the sample. Therefore, institutional herding may have a larger price impact on average in the second half of the sample.

We next examine the link between persistent institutional trading and stock returns by forming portfolios based on trade persistence and tracking their performance over periods of one to 10 quarters. We then measure the return differential between portfolios of sell and buy persistence. We adjust the portfolio returns in two different ways. First, we estimate monthly alphas from a five-factor model. Second, we compute monthly returns that are adjusted using the characteristic-matched benchmark of Daniel et al. (1997). The results for value-weighted portfolios show that a strategy based upon three-quarter institutional trade persistence yields monthly adjusted returns that vary between 15 and 22 basis points for holding periods of two years or more, regardless of the method used to compute abnormal returns. A four-quarter persistence strategy yields significant abnormal monthly returns of 19 to 24 basis points for holding periods of two years or more. Returns to equally weighted portfolios are substantially larger.

To analyze the robustness of our results to firm size, we repeat our analysis after excluding all stocks with price smaller than \$5 and all stocks with market capitalization in the lowest NYSE decile, and find no substantial changes. This result suggests that our findings are not driven by microcaps. However, we emphasize that the return predictability related to institutional trade persistence is concentrated amongst stocks with market capitalization in the bottom NYSE tercile, a feature that our study shares in common with several other papers identifying return predictability.[2] We also show that our results are associated with a substantial fraction of the aggregate institutional portfolio. The measure of stocks that drives our statistically significant results represents at least 18% to 19% of the institutional portfolio, regardless of whether we use market capitalization or dollar volume.

When we split the sample into two subperiods, we find that the return differential between portfolios of sell and buy persistence is not significant on average during the first half of the sample, while it is large and significant in the second subperiod. During this later period, a value-weighted strategy based on three-quarter institutional trade persistence yields abnormal monthly returns of

25 to 40 basis points for holding periods of two years or more, and a strategy based on four-quarter persistence yields a return of 41 to 50 basis points.

Our evidence that persistent institutional trading is associated with return reversals contributes to the debate on the price impact of institutional herding. We discuss here a few potential explanations for our findings. Distinguishing between these explanations represents a potential area for future research. One hypothesis is that institutions are affected by a behavioral bias leading them, for example, to trade on stale information, and thus contributing to prices being pushed away from fundamental values. A second hypothesis is that our findings are a consequence of the reputational concerns of delegated portfolio managers. Informally, the desire to impress investors generates endogenous herding: since better informed managers receive more correlated information, fund managers are tempted to trade in a correlated manner. This makes them excessively keen to buy (sell) assets that have been persistently bought (sold) in the recent past, leading to mispricing and thus return reversals.[3] A third alternative is that the negative association between institutional trading and stock returns arises because institutions trade against insiders with superior knowledge of future cash flows. While it is difficult to rule out this possibility given the available data, acceptance of this theory would amount to a profoundly negative indictment of the fund management industry: for our findings to be explained in this manner, it must be the case that professional money managers trade, on average, against better informed insiders, and are systematically unaware of this fact. In addition, we find that our results are robust to controlling for share issuance, a measure of intangible information. A final possibility is that retail flows drive the relationship between institutional trading and return reversals. Although they do not examine persistent institutional trading behavior, Coval and Stafford (2007) and Frazzini and Lamont (2008) find that retail flows are negatively correlated with future returns. We repeat our analysis after excluding institutions that are likely to be more subject to inflows and outflows, such as mutual funds. We find that our results remain qualitatively unchanged and of a similar order of magnitude, suggesting that such flows cannot be the main driver of our aggregate results.[4]

The remainder of the paper is organized as follows. Section I describes the data. Section II presents regression tests of the link between institutional trade persistence and the cross-section of

stock returns. Section III presents empirical results for portfolios formed on the basis of institutional trade persistence. Section IV concludes the paper.

I. Data and Descriptive Statistics

The sample consists of quarterly observations for firms listed on NYSE, Amex, and NASDAQ during the period 1983 to 2004. Data on prices, returns, and firm characteristics are from CRSP, data on book values of equity come from Compustat, and data on analyst forecasts are obtained from I/B/E/S. The sample includes common stocks of firms incorporated in the United States. Quarterly data on institutional holdings are obtained from the CDA/Spectrum database maintained by Thomson Financial. All institutions with more than $100 million under discretionary management are required to report to the SEC all equity positions greater than either 10,000 shares or $200,000 in market value. Our sample consists of an average of 1,130 managers per quarter (varying from 640 to 2,023). The aggregate value of their portfolio shows a substantial increase over the sample period, from about 30% of the CRSP market value in 1983 to 64% in 2004.

We define net trade by institutional managers in a given security as the percentage change in the number of shares of stock i belonging to the aggregate institutional portfolio at time t, $S_{i,t}$, taking place between quarter $t-1$ and quarter t: $d_{i,t} = \frac{S_{i,t}-S_{i,t-1}}{S_{i,t-1}}$. Each quarter, we rank stocks on the basis of $d_{i,t}$ and define net buys as those stocks with a value of $d_{i,t}$ above the cross-sectional median, and net sells as those stocks with a value of $d_{i,t}$ below the median.[5] Trade persistence is defined as the number of consecutive quarters in which we observe a net buy or a net sell for stock i. This variable is positive for net buys and negative for net sells. For example, a stock that has been bought in quarter t and quarter $t-1$ but has been sold in quarter $t-2$ has trade persistence 2, while a stock that has been sold in quarter t and quarter $t-1$ but has been bought in quarter $t-2$ has trade persistence -2. The maximum trade persistence assigned to a stock is 5 (-5), for stocks that have been bought (sold) for at least five consecutive quarters. Persistence values of 1 and -1 (for stocks bought or sold in quarter t only) are consolidated as persistence 0.[6]

Table I illustrates the characteristics of stocks with different trade persistence, computed as

time-series averages of cross-sectional statistics. The average number of stocks in each persistence portfolio is highest for a persistence of 0, meaning that more stocks have been bought or sold in the current quarter than in n consecutive quarters, and decreases rapidly with the horizon over which persistence is measured. The table also reports median values of net trade, $d_{i,t}$, for each persistence portfolio. Market capitalization, turnover, and book-to-market (B/M) are measured in the last month of quarter t.[7] Past returns and institutional ownership are measured in quarter t. The summary statistics show that market capitalization tends to increase across persistence portfolios, although the variation is relatively small. Share turnover increases with persistence, suggesting that institutions tend to buy stocks that are more liquid. Furthermore, institutions tend to sell value stocks (high B/M) and buy growth stocks (low B/M). Average institutional ownership is higher among stocks with positive trade persistence. Market-adjusted quarterly returns are negative for stocks that have been persistently sold and positive for stocks that have been bought by institutions.

[Insert Table I about here]

While the number of analysts following a stock (*Coverage*) does not vary across trade persistence portfolios, the summary statistics show that stocks persistently sold exhibit negative or small changes in analyst coverage during the previous year, while stocks persistently bought exhibit positive changes in analyst coverage (*Dcoverage*). We also provide several measures of valuation for the firms in our sample. Specifically, we estimate a stock's earnings-to-price ratio (E/P), cash flow-to-price ratio (CF/P), and sales-to-price ratio (S/P). As with B/M, these variables are measured at the end of year $t-1$ and are employed starting in June of year t. We exclude observations with negative accounting values. The summary statistics show that these valuation ratios are larger for portfolios of sell persistence and smaller for portfolios of buy persistence. We also compute past earnings growth for each stock in our sample, measured as the change in earnings during the year that precedes portfolio formation and scaled by price.[8] The summary statistics suggest that stocks persistently sold by institutions are characterized by low past earnings growth, while stocks persistently bought show stronger earnings growth. Finally, Table I reports the fraction of the aggregate institutional portfolio represented by each persistence portfolio, measured in terms of

market capitalization and dollar volume.

II. Regression Analysis

In this section we test the link between the persistence of institutional trading and future stock returns using regression methods. We estimate cross-sectional predictive regressions of cumulative eight-quarter market-adjusted returns on past trade persistence, past returns, and a wide variety of other control variables. Our specification is as follows:

$$R_{i,t+1:t+8} = \alpha_0 + \beta Pers_{i,t} + \gamma R_{i,t-m+1:t} + \boldsymbol{\delta X}_{i,t} + \varepsilon_{i,t},$$

where the dependent variable, $R_{i,t+1:t+8}$, is the eight-quarter market-adjusted return for stock i, cumulated over quarters $t+1$ to $t+8$. The explanatory variable $Pers_{i,t}$ is institutional trade persistence, measured by the number of consecutive quarters in which institutions buy (positive sign) or sell (negative sign) a given stock. The variable $R_{i,t-m+1:t}$ is the past return on stock i measured during a period of m quarters up to quarter t. In order to fully capture the reversal effect in returns documented in the literature (DeBondt and Thaler (1985)), we use past four-year returns measured up to quarter t ($R_{i,t-15:t}$) or three-year returns measured skipping a year before quarter t ($R_{i,t-15:t-4}$). The vector $\boldsymbol{X}_{i,t}$ contains a number of control variables that we describe below. All independent variables are standardized by subtracting their cross-sectional mean and dividing them by their cross-sectional standard deviation, to facilitate the interpretation of the coefficient estimates. The cross-sectional moments used to standardize the variables are computed each quarter. We estimate the above regressions following the Fama-MacBeth (1973) procedure. The regression estimates are time-series averages of coefficients obtained from quarterly cross-sectional regressions. The t-statistics are computed from standard errors that are adjusted for autocorrelation following Newey and West (1987).[9]

Table II reports the results from the regression analysis. We start by focusing on specifications (1) and (2). The coefficient estimates show that institutional trade persistence significantly predicts future return reversals. The results imply that a one-standard deviation increase in trade persistence

predicts a decrease in future returns of about 1%, net of the effects of all control variables. We control for the reversal effect associated with past long-term returns, for firm size ($cap_{i,t}$), book-to-market ($b/m_{i,t}$), institutional ownership ($own_{i,t}$), and share turnover ($turn_{i,t}$). We also add a measure of change in analyst coverage ($dcoverage_{i,t}$). The coefficient estimates provide evidence that changes in analyst coverage are associated with reversals in long-term returns.[10] These results are consistent with Kecskes and Womack (2008), who find that firms added (dropped) by analysts have positive (negative) contemporaneous abnormal returns and zero (positive) future abnormal returns. We then control for the impact of share issuance and repurchase activity on long-run returns, since a number of papers show evidence of a negative relationship between firm issuance activity and future long-run returns (see Ikenberry, Lakonishok, and Vermaelen (1995), Loughran and Ritter (1995), and Daniel and Titman (2006)). Following Daniel and Titman (2006), we construct a measure of share issuance ($issuance_{i,t}$) capturing a firms' growth in market value that is not attributable to past returns. This measure increases with seasoned equity offerings, employee stock option plans, and share-based acquisitions, while it decreases with share repurchases and dividend distributions.[11] The coefficient estimates in regressions (1) and (2) show that share issuance has a negative and significant impact on future returns.

To enhance the ability of the regressions to control for the value effect on long-term returns, and thus to better identify the predictive ability of institutional trade persistence, we add earnings-to-price ($e/p_{i,t}$), cash flow-to-price ($cf/p_{i,t}$), and sales-to-price ($s/p_{i,t}$) as further proxies for value. Finally, we include a control for past earnings growth ($e\ growth_{i,t}$) in our regression specification. The descriptive statistics in Table I show that past earnings growth is low for stocks that institutions tend to persistently sell, and increases with institutional buy persistence, consistent with the finding that institutions tend to buy growth stocks and sell value stocks. As argued in Fama and French (1995), high book-to-market firms exhibit consistently low earnings profitability, while low book-to-market firms show higher profitability. The results from the regressions generally yield a positive estimate for the coefficients on the accounting ratios and past growth, consistent with the reversal effect in returns associated with value, but the estimates are not statistically significant.[12]

[Insert Table II about here]

To better identify the role of institutional trading in explaining the association between trade persistence and future returns, we include an interaction term between trade persistence and institutional ownership in specifications (3) and (4). The institutional ownership of a given stock can be viewed as a proxy for the measure of institutional trade in that stock. Since institutional ownership is positively correlated with size (the average correlation between a stock's level of institutional ownership and the log of its market capitalization is 66% in our sample), we employ a stock's *residual* institutional ownership ($Rown_{i,t}$), constructed as the residual from a cross-sectional regression of institutional ownership on market capitalization.[13] We standardize this measure with respect to its cross-sectional distribution, as we do for all the explanatory variables in the regression analysis. Columns (3) and (4) of Table II show that the coefficients on trade persistence are slightly smaller and less significant, and the coefficients on the interaction term are strongly negative. Thus, the return reversal associated with trade persistence is larger for stocks with higher levels of institutional ownership. This finding reinforces the link between institutional trading and future returns, and provides further evidence that the effect of trade persistence on returns is distinct from the value effect. As documented in Nagel (2005), the value effect is generally larger for stocks with lower levels of institutional ownership.

We next estimate cross-sectional regressions for two periods of equal length, 1983 to 1993 and 1994 to 2004. The results are presented in columns (5) to (8) of Table II. In the first half of the sample, the estimated coefficient on the interaction between persistence and residual institutional ownership is -2% and strongly significant, while the coefficient on trade persistence alone is not. This means that trade persistence predicts return reversals only for stocks with above average institutional ownership. In the more recent sample period the estimated coefficient on trade persistence is negative (-1.6% to -1.8%) and strongly significant, and the interaction term does not play an important role. This result implies that the reversal effect associated with trade persistence is unconditionally strong, even for stocks with an average level of institutional ownership. At an intuitive level, this finding could be explained by the unprecedented growth in the delegated portfolio management industry that occurred during our sample period, where institutional ownership increased from 24% in the first half of the sample to 35% in the second half, on average. When the

proportion of institutional trade is not high enough, it is possible that the return effect induced by institutional trade persistence does not show up on average, even if it is present for stocks with high institutional ownership and trading.

In summary, the regression results in Table II show that the reversal effect associated with institutional trade persistence is robust to controlling for past returns, book-to-market, turnover, market capitalization, institutional ownership, changes in analyst coverage, equity issuance activity, and a number of valuation ratios capturing the value and growth characteristics of a stock. Furthermore, the effect of trade persistence on future returns is generally stronger for stocks with higher levels of institutional ownership.[14]

III. Trade Persistence Portfolios

In this section we analyze the relationship between trade persistence and future returns by estimating the returns to portfolios of stocks sorted by institutional trade persistence. Specifically, we evaluate the difference in monthly returns between portfolios of stocks with sell persistence and portfolios of stocks with buy persistence.

We use the calendar methodology to compute average monthly returns from overlapping portfolios formed at the end of each quarter t on the basis of past trade persistence, and held for up to 10 quarters in the future. This approach implies that, for a holding period of k quarters, a fraction $1/k$ of the portfolio is rebalanced every quarter. We consider two alternative ways of adjusting the returns for risk exposures and stock characteristics. We first estimate intercepts from a five-factor model that includes the Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. We also compute abnormal returns with respect to a benchmark that is matched to the stock on the basis of its size, book-to-market, and momentum characteristics, following Daniel et al. (1997) (DGTW). The benchmark portfolios are constructed from the CRSP universe by sorting stocks first on size (using NYSE cutoffs), then on book-to-market, and finally on past annual returns. The portfolios are value-weighted.

Table III presents the estimated intercepts (alphas) and the DGTW returns for value-weighted

persistence portfolios. The results show that a strategy that buys stocks sold by institutions over three quarters and sells stocks bought by them over the same period yields an abnormal return between 15 and 22 basis points per month for holding periods of two years or more, depending on whether the returns are estimated alphas or characteristic-adjusted returns. A strategy based on four-quarter trade persistence generally yields abnormal returns of about 19 to 24 basis points for holding periods of two years or more. A strategy based on longer trade persistence does not show significant profitability.

[Insert Table III about here]

We also compute alphas and DGTW returns for equally weighted portfolios.[15] Equally weighted strategies exhibit larger and more significant abnormal returns. For a holding period of two years or more, the abnormal returns vary between 19 and 34 basis points for trade persistence of three quarters, and between 31 and 48 basis points for trade persistence of four quarters. A trading strategy based on longer trade persistence (-5,5) is also significantly profitable.

We note that the positive return differentials between sell and buy persistence are mostly due to the large and significant returns of stocks that have been persistently sold by institutional investors. Therefore, short-sale constraints would not limit the profitability of such strategies, which earn most of their returns from buying stocks that institutions have been selling for a number of quarters.[16]

To analyze the robustness of our results to firm size, we repeat our analysis after excluding all stocks with price smaller than $5 and all stocks with market capitalization in the lowest decile of the NYSE. Table IV presents the results from this analysis for value-weighted portfolios. The estimated returns are similar to those obtained from the entire sample. For example, considering a holding period of two years, the five-factor alphas are 20, 23, and 10 basis points using the entire sample of stocks, and 18, 23, and 8 basis points after eliminating small, low-priced stocks. The DGTW returns change from 16, 21, and 19 basis points to 15, 23, and 19 basis points. These results confirm that our findings are not driven by microcaps.

[Insert Table IV about here]

The return predictability that we identify is concentrated, however, amongst stocks with market capitalization in the bottom tercile of the NYSE, a feature consistent with other papers identifying cross-sectional return predictability (see, for example, Fama and French (2008)). Table V presents estimates of five-factor alphas and DGTW returns for value-weighted portfolios based on institutional trade persistence. Stocks are sorted by market capitalization based on NYSE cutoff points. The estimates show that long-horizon return differentials between sell and buy persistence are generally positive and significant for stocks in the small NYSE tercile.[17]

[Insert Table V about here]

The predictability of institutional trade persistence is associated with a substantial fraction of the aggregate institutional portfolio. The measure of stocks that drive our statistically significant results represents at least 18% to 19% of the institutional portfolio in terms of market capitalization and dollar volume. To appreciate what measure of stocks drives our results, we use the following criterion. Taking our main value-weighted portfolio results (Table III), we consider only those portfolios for which the monthly abnormal returns at long horizons (eight quarters or higher) are significant at the 10% level measured by both five-factor alphas and DGTW characteristic-adjusted returns. This includes the (-3,3) and (-4,4) portfolios. From Table I, we see that these portfolios represent approximately 18% to 19% of the institutional portfolio, depending on the specific measure used.[18] For comparability, other studies on the price impact of herding are also driven by a similar or smaller proportion of the institutional portfolio. For example, Wermers (1999) finds that herding by mutual funds has a significant price effect for a subset of stocks representing about 20% of the value of stocks traded by mutual funds. Lakonishok, Shleifer, and Vishny (1992) find that pension fund herding is related to future returns for stocks that amount to about 3% of the total value of stocks traded by pension funds.

We next examine the predictability of institutional trade persistence over two subperiods of equal length, 1983 to 1993 and 1994 to 2004. We compute five-factor alphas and DGTW returns for portfolios that buy stocks with negative trade persistence and sell stocks with positive trade persistence. Table VI reports the returns for the two subperiods. The return differential between

buy and sell persistence stocks is not significant in the first half of the sample, and becomes very large, positive, and significant in the later subperiod. For example, the two-year return differential ranges from -19 to 5 basis points in the first period, and varies between 28 and 45 basis points in the second period. This is consistent with our regression results, which show that the impact of institutional trading on the cross-section of stock returns is higher on average in the second half of the sample.[19]

[Insert Table VI about here]

IV. Conclusions

An important strand of the recent empirical literature on institutional herding finds evidence of a positive correlation between the direction of institutional trading and future short-term returns. These studies focus on relatively short-term herding, typically measured over one or two quarters. Motivated by the theoretical literature on herding, which emphasizes endogenous persistence in decisions over time, we focus here on the temporal dimension of institutional trading. We test the impact of multi-quarter persistent patterns of buying and selling by institutions on the cross-section of stock returns. Using both regression and portfolio tests, we show that persistence in institutional trading has significant power to predict the cross-section of stock returns at long horizons, after controlling for past returns and other variables that are known to predict returns. Institutional trade persistence is associated with reversals in returns. Stocks that are persistently sold by institutions over three to five quarters outperform stocks that are persistently bought by them, after a period of about two years. Thus, our long-term results complement the existing literature on the short-term price impact of institutional herding.

Our regression tests show that the effect of institutional trade persistence on stock returns is not subsumed by the effect of past returns or other stock characteristics, like book-to-market, size, share issuance activity, changes in analyst coverage, and a number of valuation ratios capturing a firm's value and growth characteristics. The return reversal associated with trade persistence is particularly strong for stocks with higher levels of institutional ownership, and is unconditionally

strong and significant in the second half of our sample period.

Trading strategies that buy stocks persistently sold and sell stocks persistently bought by institutions yield positive long-term abnormal returns. These results are concentrated among small stocks, but are not driven by microcap stocks. Moreover, the return differential between portfolios of sell and buy persistence is driven by the second half of our sample period. This is consistent with our cross-sectional regression results and mirrors the dramatic growth of the delegated portfolio management industry during the sample period.

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Notes

[1]Other papers finding evidence of a positive correlation between institutional demand and future returns include Nofsinger and Sias (1999), Grinblatt, Titman, and Wermers (1995), Cohen, Gompers, and Vuolteenaho (2002), and Chen, Hong, and Stein (2002), among others.

[2]Fama and French (2008), for example, find that the abnormal returns to several anomalies are not equally strong across all size groups.

[3]Theoretical foundations for this idea can be found in Dasgupta and Prat (2008) and Dasgupta, Prat, and Verardo (2010), who study the sequential trading behavior of fund managers whose future pay depends on investors' perception of the precision of their information.

[4]A few recent studies document a negative relationship between institutional trading and stock returns. For example, Dennis and Strickland (2002) find that stocks mostly owned by institutions experience return reversals during six months following a large market drop. Other very recent papers include Gutierrez and Kelley (2009), who find evidence of reversals after institutional buy herding measured over one quarter, and Puckett and Yan (2008), who examine high frequency institutional herding and find evidence of return reversals after short-term sell herds.

[5]We obtain similar results if we classify net buys and net sells according to the sign of $d_{i,t}$. Furthermore, our findings are robust to using two alternative definitions of net trade: the change in the number of shares scaled by shares outstanding, and the change in the number of shares scaled by trading volume. These results are shown in the Internet Appendix, available at http://www.afajof.org/supplements.asp.

[6]To reconcile our results with the existing literature on institutional herding, we perform our empirical analysis using a long-horizon version of commonly used one-period herding measures. We use the number of buyers of stock i in quarter t as a fraction of the total number of active traders in the stock, a measure based on Lakonishok, Shleifer, and Vishny (1992). We also use signed herding, as defined in Wermers (1999). We then construct measures of "herding persistence" by counting the number of consecutive quarters during which a stock exhibits buy or sell herding. The results are consistent with the findings presented using our trade persistence measure, and suggest

that the link between trade persistence and returns is not specific to our definition of institutional trading. The estimates from these tests are presented in the Internet Appendix.

[7]Since NASDAQ is a dealer market and thus volume is double-counted, we divide NASDAQ volume by two so that turnover is comparable across different exchanges. The results do not change if we subtract from each stock's volume the average volume of the exchange in which the stock is traded.

[8]Alternatively, we measure the change in earnings between quarter t and quarter $t-4$, to account for the seasonality in the earnings process. The results are not sensitive to the measurement method for past earnings growth.

[9]We also estimate panel regressions that include time fixed effects and allow for clustering of the standard errors by firm. Alternatively, we estimate the panel regressions by including time and firm fixed effects. We present results for the Fama-MacBeth (1973) specification because it yields standard errors that are more conservative across all alternatives.

[10]This result is robust to measuring changes in analyst coverage between quarter t and quarter $t-1$, or between quarter t and quarter $t-4$, to account for possible seasonalities in analyst coverage.

[11]The variable $issuance_{i,t}$ is defined as $\log\left(\frac{ME_{i,t}}{ME_{i,t-\tau}}\right) - r_{i,t-\tau:t}$, where $ME_{i,t}$ is a firm's market equity at the end of quarter t and $r_{i,t-\tau:t}$ is the log stock's return from $t-\tau$ to t. We measure share issuance over a four-year horizon to be consistent with the measurement period for past returns, but the results do not vary if we measure issuance activity over any horizon from one year (as in Pontiff and Woodgate (2008)) to five years (as in Daniel and Titman (2006)).

[12]We also re-estimate the cross-sectional regressions after excluding January returns to provide a further test that the reversal effect associated with trade persistence is distinct from the value effect (see Loughran (1997), for example). We find that the results remain qualitatively similar. For the more recent sample period, institutional trade persistence is the only variable that significantly predicts two-year future returns, while both book-to-market and changes in analyst coverage lose their significance. These results are presented in the Internet Appendix.

[13]Following Nagel (2005), we first perform a logit transformation of institutional ownership, $\text{logit}(Own_{i,t}) = \log\left(\frac{Own_{i,t}}{1-Own_{i,t}}\right)$, and then estimate the following quarterly cross-sectional regression:

$\text{logit}(Own_{i,t}) = a + b \log Cap_{i,t} + c(\log Cap_{i,t})^2 + e_{i,t}$. We use the residual $e_{i,t}$ (denoted $Rown_{i,t}$) as our measure of residual institutional ownership for stock i in quarter t.

[14]We also re-estimate our cross-sectional regressions for non-overlapping one-quarter returns measured one to eight quarters in the future. The coefficient estimates suggest that, except for the first two quarters, trade persistence has a negative and significant impact on the returns of all future quarters during the two-year period considered. The results from these tests are presented in the Internet Appendix.

[15]The results from these tests are presented in the Internet Appendix.

[16]The Internet Appendix presents CAPM alphas that are separately estimated for portfolios of buy and sell persistence.

[17]We also estimate returns to persistence portfolios excluding the month of January to check for possible misspecifications of the value benchmark (see, for example, Loughran (1997)). The estimated returns are similar to those obtained using all calendar months and are presented in the Internet Appendix.

[18]If we include the (-5,5) portfolio, for which results are significant for equally weighted portfolios but not for value-weighted ones, then the measure of stocks driving our results rises to 26% to 27% of the institutional portfolio.

[19]To conclude our portfolio analysis, we explore the possibility that our results are driven by retail flows, given previous evidence that mutual fund flows are negatively associated with future returns (see Coval and Stafford (2007) and Frazzini and Lamont (2008)). We examine a subsample of stocks after excluding those institutions that are more likely to be subject to retail flows, like mutual funds and investment advisors (over 40% of our observations). We find that the results are qualitatively similar and we conclude that the negative relationship between persistence of trading and returns is not driven by retail flows.

Table I

Characteristics of Portfolios Based on Institutional Trade Persistence

This table reports time-series averages of quarterly cross-sectional means and medians for characteristics of portfolios based on institutional trade persistence. Trade persistence is the number of consecutive quarters for which we observe a net institutional buy or a net institutional sell for stock i. Net buys have positive persistence and net sells have negative persistence. Net institutional trade in security i is defined as the percentage change in the number of shares of i in the aggregate institutional portfolio from the end of quarter $t-1$ to the end of quarter t: $d_{i,t}=\frac{S_{i,t}-S_{i,t-1}}{S_{i,t-1}}$, where $S_{i,t}$ is the number of shares of i in the institutional portfolio in quarter t. Net buys (sells) are stocks with a value of $d_{i,t}$ above (below) the cross-sectional median in quarter t. At the end of each quarter t, stocks are assigned to portfolios based on the persistence of institutional net trade. Persistence 0 includes stocks that have been bought or sold in quarter t. The portfolio with persistence -5 (5) includes stocks that have been sold (bought) for at least five consecutive quarters. Market cap is a stock's market capitalization ($ millions) measured at the end of quarter t. NYSE Cap is the average NYSE decile of market capitalization to which a stock belongs. B/M is the book-to-market ratio measured at the end of quarter t. Share Turnover is the monthly trading volume of stock i scaled by total shares outstanding, measured in the last month of quarter t. Inst. Ownership is the number of shares of stock i held by institutional investors divided by total shares outstanding, measured in quarter t. Past Return is the portfolio equally weighted market-adjusted return, measured in quarter t. Coverage is the number of analysts following a stock in the year before portfolio formation. Dcoverage is the change in the number of analysts following a stock during the year preceding portfolio formation. E/P is the earnings-to-price ratio. CF/P is the cash flow-to-price ratio. S/P is the sales-to-price ratio. These valuation ratios are measured in the year preceding portfolio formation. Earnings growth is the annual change in earnings before portfolio formation, scaled by price. Fraction value and fraction dollar volume are the fractions of the aggregate institutional portfolio represented by each persistence portfolio in terms of market capitalization and dollar volume.

Persistence Portfolio:	-5	-4	-3	-2	0	2	3	4	5
Number of stocks	160	136	256	514	2220	498	250	134	174
Net Trade (median)	-0.038	-0.042	-0.042	-0.041	0.015	0.103	0.103	0.107	0.103
Mkt Cap ($mill., mean)	855	1042	1066	1039	1021	953	882	934	1038
Mkt Cap ($mill., median)	37.4	60.4	72.1	85.9	90.7	130.2	151.8	177.4	220.1
NYSE Cap Decile	2.7	3.1	3.3	3.4	3.6	3.8	3.9	4.0	4.3
B/M	1.06	1.08	0.97	0.88	0.74	0.63	0.56	0.53	0.47
Share Turnover	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.08
Inst. Ownership	0.21	0.23	0.25	0.26	0.28	0.3	0.31	0.33	0.36
Past Return	-0.022	-0.027	-0.032	-0.034	-0.005	0.035	0.039	0.041	0.038
Coverage (median)	4.3	4.6	4.6	4.4	3.9	3.8	3.7	3.6	3.9
Dcoverage (median)	-0.12	0.11	0.16	0.16	0.14	0.18	0.22	0.31	0.60
E/P (median)	0.077	0.073	0.071	0.067	0.062	0.058	0.054	0.051	0.045
CF/P (median)	0.114	0.107	0.100	0.095	0.087	0.079	0.072	0.068	0.059
S/P (median)	1.969	1.566	1.404	1.258	1.102	0.975	0.886	0.818	0.721
Earnings growth (median)	-0.006	0.003	0.006	0.007	0.007	0.008	0.009	0.010	0.016
Fraction value	0.04	0.04	0.06	0.13	0.51	0.11	0.05	0.03	0.04
Fraction dollar volume	0.04	0.03	0.06	0.12	0.49	0.11	0.06	0.03	0.05

Table II

Cross-sectional Predictive Regressions of Long-term Stock Returns

This table reports Fama-MacBeth (1973) coefficient estimates from predictive regressions of cumulative eight-quarter market-adjusted returns on past trade persistence, past returns, and control variables. Past returns are measured during four years up to quarter t ($R_{i,t-15:t}$) or during three years skipping a year before quarter t ($R_{i,t-15:t-4}$). Share issuance ($issuance_{i,t}$) is the composite measure of share issuance constructed as in Daniel and Titman (2006). $Pers\_Rown_{i,t}$ is an interaction term defined as the product between institutional trade persistence $Pers_{i,t}$ and residual ownership $Rown_{i,t}$, where $Rown_{i,t}$ is estimated from cross-sectional regressions of a logit transformation of institutional ownership on log(cap) and $(\log(cap))^2$. The other independent variables are described in Table I. All independent variables are standardized using their quarterly cross-sectional mean and standard deviation. t-statistics (in parentheses) are adjusted following Newey-West (1987). *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

	Entire sample				1983 to 1993		1994 to 2004	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Pers_{i,t}$	-0.009**	-0.011**	-0.007*	-0.008*	0.000	0.000	-0.016***	-0.018***
	(-2.57)	(-2.33)	(-1.84)	(-1.87)	(0.00)	(-0.07)	(-3.29)	(-2.86)
$Pers\_Rown_{i,t}$			-0.011**	-0.011**	-0.020***	-0.020***	0.000	0.000
			(-2.09)	(-2.12)	(-3.05)	(-2.97)	(0.03)	(-0.05)
$R_{i,t-15:t}$	0.002		-0.001		0.014		-0.019	
	(0.12)		(-0.08)		(0.65)		(-0.70)	
$R_{i,t-15:t-4}$		0.004		-0.001		-0.004		0.003
		(0.30)		(-0.09)		(-0.19)		(0.15)
$cap_{i,t}$	-0.010	-0.008	-0.008	-0.008	0.015	0.017	-0.036	-0.035
	(-0.45)	(-0.36)	(-0.38)	(-0.37)	(0.61)	(0.66)	(-1.04)	(-1.04)
$b/m_{i,t}$	0.036	0.033	0.050	0.037	0.020	0.000	0.085**	0.093***
	(0.87)	(0.78)	(1.14)	(0.86)	(0.26)	(0.00)	(2.57)	(2.77)
$own_{i,t}$	-0.017	-0.017	-0.014	-0.014	-0.001	-0.003	-0.029	-0.027
	(-1.53)	(-1.56)	(-1.24)	(-1.31)	(-0.09)	(-0.23)	(-1.48)	(-1.42)
$turn_{i,t}$	0.034*	0.030	0.032	0.029	0.000	0.000	0.069**	0.062*
	(1.73)	(1.55)	(1.61)	(1.51)	(-0.01)	(-0.00)	(2.10)	(1.91)
$dcoverage_{i,t}$	-0.014***	-0.015***	-0.016***	-0.016***	-0.025***	-0.023***	-0.004	-0.008*
	(-2.75)	(-3.02)	(-2.67)	(-3.02)	(-2.98)	(-2.72)	(-0.83)	(-1.79)
$issuance_{i,t}$	-0.015*	-0.017**	-0.007	-0.009	-0.009	-0.006	-0.005	-0.012
	(-1.65)	(-2.10)	(-1.61)	(-1.31)	(-1.57)	(-1.04)	(-0.63)	(-0.93)
$e/p_{i,t}$	-0.002	0.001	-0.002	0.003	-0.011	-0.003	0.009	0.006
	(-0.10)	(0.03)	(-0.08)	(0.12)	(-0.36)	(-0.09)	(0.24)	(0.14)
$cf/p_{i,t}$	0.016	0.017	0.010	0.014	-0.003	-0.004	0.024	0.030
	(0.67)	(0.68)	(0.40)	(0.56)	(-0.11)	(-0.13)	(0.61)	(0.69)
$s/p_{i,t}$	0.042	0.047	0.042	0.050	0.054***	0.056***	0.028	0.037
	(1.39)	(1.51)	(1.43)	(1.63)	(2.80)	(2.80)	(0.49)	(0.62)
$e\ growth_{i,t}$	0.022	0.015	0.039	0.023	0.117*	0.095*	-0.053	-0.064
	(0.63)	(0.45)	(0.54)	(0.73)	(1.69)	(1.76)	(-0.43)	(-0.50)

Table III

Adjusted Return Differentials for Institutional Trade Persistence Portfolios

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$. The portfolios are value-weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. Five-factor alphas are estimated intercepts from the five-factor model, which includes the three Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. DGTW returns are measured using characteristic-matched benchmarks (size, book-to-market, and momentum) as in Daniel et al. (1997). Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Five-factor alphas (VW)										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.53**	0.36**	0.33**	0.43***	0.35***	0.31***	0.21**	0.20**	0.22***	0.21***
	(2.53)	(2.41)	(2.46)	(3.46)	(3.08)	(2.88)	(2.19)	(2.36)	(2.71)	(2.72)
(-4,4)	0.10	0.15	0.28	0.20	0.24	0.16	0.16	0.23*	0.20*	0.24**
	(0.34)	(0.71)	(1.48)	(1.20)	(1.59)	(1.17)	(1.30)	(1.92)	(1.81)	(2.36)
(-5,5)	0.32	0.46*	0.39*	0.27	0.16	0.17	0.12	0.10	0.13	0.13
	(1.22)	(1.92)	(1.79)	(1.26)	(0.77)	(0.90)	(0.70)	(0.62)	(0.80)	(0.81)
Panel B: DGTW returns (VW)										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.04	0.07	0.08	0.20**	0.18**	0.17**	0.15**	0.16**	0.16**	0.15**
	(0.23)	(0.66)	(0.74)	(2.14)	(2.12)	(2.13)	(2.03)	(2.30)	(2.38)	(2.27)
(-4,4)	0.17	0.07	0.15	0.10	0.15	0.18*	0.19*	0.21**	0.19**	0.20**
	(0.75)	(0.39)	(1.08)	(0.87)	(1.39)	(1.66)	(1.88)	(2.17)	(2.10)	(2.39)
(-5,5)	-0.08	0.10	0.16	0.16	0.14	0.18	0.21	0.19	0.20	0.20
	(-0.38)	(0.54)	(0.94)	(0.92)	(0.83)	(1.10)	(1.31)	(1.26)	(1.36)	(1.41)

Table IV

Adjusted Return Differentials for Institutional Trade Persistence Portfolios Excluding Small Stocks and Penny Stocks

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$. All stocks with price below $ 5.00 and all stocks belonging to the smallest NYSE decile of market capitalization are excluded from the sample. The portfolios are value-weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. Five-factor alphas are estimated intercepts from the five-factor model, which includes the three Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. DGTW returns are measured using characteristic-matched benchmarks as in Daniel et al. (1997). Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Five-factor alphas (VW)										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.48**	0.32**	0.30**	0.40***	0.33***	0.28***	0.18*	0.18**	0.20**	0.18**
	(2.27)	(2.12)	(2.20)	(3.20)	(2.83)	(2.62)	(1.93)	(2.06)	(2.41)	(2.37)
(-4,4)	0.12	0.17	0.29	0.22	0.26*	0.17	0.17	0.23*	0.19*	0.24**
	(0.40)	(0.80)	(1.54)	(1.36)	(1.69)	(1.25)	(1.36)	(1.93)	(1.75)	(2.29)
(-5,5)	0.29	0.42*	0.37*	0.24	0.14	0.15	0.10	0.08	0.10	0.10
	(1.07)	(1.74)	(1.65)	(1.12)	(0.66)	(0.79)	(0.57)	(0.46)	(0.62)	(0.61)
Panel B: DGTW returns (VW)										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.00	0.04	0.05	0.18*	0.17*	0.16**	0.14*	0.15**	0.15**	0.14**
	(0.00)	(0.38)	(0.53)	(1.94)	(1.95)	(1.98)	(1.86)	(2.13)	(2.22)	(2.05)
(-4,4)	0.17	0.07	0.17	0.13	0.17	0.20*	0.20**	0.23**	0.20**	0.21**
	(0.74)	(0.44)	(1.18)	(1.07)	(1.56)	(1.82)	(2.04)	(2.29)	(2.16)	(2.43)
(-5,5)	-0.07	0.10	0.16	0.15	0.14	0.18	0.21	0.19	0.19	0.19
	(-0.35)	(0.52)	(0.92)	(0.87)	(0.79)	(1.06)	(1.28)	(1.20)	(1.29)	(1.33)

Table V

Adjusted Return Differentials for Institutional Trade Persistence Portfolios By NYSE Market Capitalization

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$. The portfolios are value-weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. Five-factor alphas are estimated intercepts from the five-factor model, which includes the three Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. DGTW returns are measured using characteristic-matched benchmarks as in Daniel et al. (1997). Cap is the tercile of NYSE market capitalization to which the stock belongs in a given month. Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

		Five-factor alphas (VW)						DGTW returns (VW)					
		Holding period						Holding period					
Cap	Pers	3m	6m	12m	18m	24m	30m	3m	6m	12m	18m	24m	30m
	(-3,3)	-0.06	0.01	0.21**	0.16*	0.22***	0.25***	-0.28*	-0.22*	0.02	-0.01	0.06	0.10
		(-0.37)	(0.10)	(2.00)	(1.68)	(2.61)	(3.37)	(-1.72)	(-1.78)	(0.23)	(-0.11)	(0.84)	(1.37)
1	(-4,4)	-0.43	0.04	0.23	0.29**	0.33***	0.31***	-0.25	0.08	0.13	0.22*	0.21*	0.17*
		(-1.75)	(0.21)	(1.43)	(2.00)	(2.67)	(2.78)	(-1.10)	(0.46)	(1.06)	(1.82)	(1.77)	(1.77)
	(-5,5)	0.60**	0.57**	0.60***	0.66***	0.61***	0.58***	0.62***	0.57***	0.54***	0.48***	0.47***	0.48***
		(2.48)	(2.54)	(3.17)	(3.64)	(3.61)	(3.92)	(2.78)	(3.06)	(3.41)	(2.96)	(3.13)	(3.75)
	(-3,3)	0.18	0.28**	0.21*	0.20**	0.14*	0.11	0.08	0.13	0.21**	0.23***	0.22***	0.22***
		(0.93)	(1.96)	(1.84)	(2.09)	(1.71)	(1.46)	(0.50)	(1.05)	(2.27)	(2.82)	(3.06)	(3.16)
2	(-4,4)	0.39	0.09	0.13	-0.01	0.11	0.08	0.35	-0.03	0.22	0.13	0.18*	0.14
		(1.56)	(0.46)	(0.89)	(-0.05)	(0.87)	(0.73)	(1.62)	(-0.16)	(1.63)	(1.15)	(1.71)	(1.35)
	(-5,5)	0.95***	0.71***	0.38*	0.23	0.18	0.10	0.70***	0.53**	0.19	0.18	0.17	0.12
		(3.21)	(2.75)	(1.88)	(1.36)	(1.21)	(0.75)	(2.63)	(2.33)	(1.03)	(1.07)	(1.09)	(0.81)
	(-3,3)	0.57**	0.39**	0.41***	0.21*	0.10	0.10	0.11	0.13	0.25**	0.20**	0.19**	0.16**
		(2.27)	(2.26)	(2.89)	(1.79)	(0.97)	(1.08)	(0.51)	(0.95)	(2.21)	(2.12)	(2.26)	(2.08)
3	(-4,4)	-0.02	0.08	0.10	0.05	0.15	0.19	0.05	0.06	0.07	0.17	0.24*	0.28**
		(-0.05)	(0.31)	(0.53)	(0.28)	(0.93)	(1.39)	(0.17)	(0.28)	(0.45)	(1.21)	(1.91)	(2.41)
	(-5,5)	0.01	0.23	0.12	0.04	-0.03	-0.05	-0.33	-0.10	0.04	0.10	0.14	0.17
		(0.03)	(0.82)	(0.48)	(0.16)	(-0.15)	(-0.26)	(-1.25)	(-0.42)	(0.19)	(0.50)	(0.77)	(0.97)

Table VI

Adjusted Return Differentials for Institutional Trade Persistence Portfolios
Subperiod Evidence

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$ during two sample periods of equal length: 1983 to 1993 and 1994 to 2004. The portfolios are value-weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. Five-factor alphas are estimated intercepts from the five-factor model, which includes the three Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. DGTW returns are measured using characteristic-matched benchmarks (size, book-to-market, and momentum) as in Daniel et al. (1997). Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Five-factor alphas (VW)

	1983 to 1993						1994 to 2004					
	Holding period						Holding period					
Pers	3m	6m	12m	18m	24m	30m	3m	6m	12m	18m	24m	30m
(-3,3)	0.34	0.17	0.02	-0.04	0.05	0.07	0.88***	0.62***	0.88***	0.69***	0.40***	0.38***
	(1.57)	(1.06)	(0.12)	(-0.39)	(0.56)	(0.83)	(2.69)	(2.87)	(4.54)	(4.09)	(3.04)	(3.28)
(-4,4)	-0.06	-0.27	-0.15	-0.09	0.05	0.01	0.28	0.62**	0.56**	0.46**	0.45**	0.50***
	(-0.19)	(-1.12)	(-0.82)	(-0.55)	(0.39)	(0.13)	(0.65)	(1.97)	(2.34)	(2.27)	(2.50)	(3.13)
(-5,5)	-0.58*	-0.32	-0.40	-0.24	-0.19	-0.12	1.24***	1.25***	0.97***	0.61**	0.43*	0.41*
	(-1.81)	(-1.10)	(-1.50)	(-0.97)	(-0.85)	(-0.63)	(3.16)	(3.58)	(3.16)	(2.28)	(1.78)	(1.75)

Panel B: DGTW returns (VW)

	1983 to 1993						1994 to 2004					
	Holding period						Holding period					
Pers	3m	6m	12m	18m	24m	30m	3m	6m	12m	18m	24m	30m
(-3,3)	0.05	0.06	-0.02	-0.04	0.03	0.04	0.02	0.09	0.41***	0.37***	0.28**	0.25**
	(0.28)	(0.45)	(-0.23)	(-0.48)	(0.54)	(0.69)	(0.09)	(0.49)	(2.62)	(2.68)	(2.31)	(2.20)
(-4,4)	0.15	-0.25	-0.19	-0.10	-0.01	-0.02	0.18	0.36	0.39**	0.44**	0.41**	0.42***
	(0.67)	(-1.33)	(-1.41)	(-0.90)	(-0.06)	(-0.23)	(0.47)	(1.35)	(2.03)	(2.51)	(2.55)	(2.91)
(-5,5)	-0.88***	-0.59**	-0.40*	-0.17	-0.05	0.02	0.69**	0.76***	0.69***	0.52**	0.42*	0.36*
	(-3.33)	(-2.38)	(-1.83)	(-0.81)	(-0.27)	(0.14)	(2.32)	(2.85)	(2.75)	(2.09)	(1.79)	(1.65)

Internet Appendix for "Institutional Trade Persistence and Long-term Equity Returns"

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In this document we provide supplementary material and robustness tests on the relationship between institutional trade persistence and the cross-section of stock returns. This document is organized as follows. Section I presents returns to equally weighted portfolios based on institutional trade persistence. Section II contains a set of robustness tests that use alternative measures of institutional trading and alternative measures of institutional herding. Section III presents CAPM alphas for equally weighted and value-weighted portfolios of stocks characterized by different institutional trade persistence. Section IV contains regression and portfolio tests of the link between institutional trade persistence and stock returns, after excluding the month of January from the analysis. Finally, Section V briefly describes a set of tables with additional results from regression and portfolio tests.

I. Equally Weighted Portfolio Returns

Table IA.I presents five-factor alphas and DGTW returns to equally weighted portfolios based on institutional trade persistence. The portfolios buy stocks persistently sold by institutions and sell stocks persistently bought by them. The equally weighted returns to these strategies are generally large and statistically significant. For a holding period of two years or more, for example, the abnormal returns vary between 19 and 34 basis points for trade persistence of three quarters, and between 31 and 48 basis points for trade persistence of four quarters. A trading strategy based on longer trade persistence (-5,5) is also significantly profitable and yields average monthly returns ranging between 39 and 66 basis points.

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II. Robustness to Alternative Measures of Trading and Herding

A. *Alternative Trading Measures*

In our analysis of trade persistence we define institutional net trading as the percentage change in the number of stocks in the institutional portfolio in quarter t, $d_{i,t}$. We now check whether our results still hold using alternative measures of net trade. In particular, we consider two alternative measures:

1. The change in the number of shares of security i in the institutional aggregate portfolio scaled by the number of shares outstanding, $d_{i,t}^{Out} = \frac{S_{i,t}-S_{i,t-1}}{Out_{i,t-1}}$.

2. The change in the number of shares of security i in the institutional aggregate portfolio scaled by trading volume, $d_{i,t}^{Vol} = \frac{S_{i,t}-S_{i,t-1}}{Vol_{i,t-1}}$.

Similar to our main measure of net trade, $d_{i,t}$, we define institutional buys and sells based on the value of these new measures with respect to their cross-sectional median, and measure trade persistence by counting the number of consecutive quarters in which a stock is bought or sold by institutional investors. Table IA.II shows descriptive statistics of persistence portfolios based on these alternative measures of net trade. The portfolios exhibit very similar characteristics to those formed according to our original measure of trade persistence and illustrated in Table I of the published article.

Next, we estimate Fama-MacBeth (1973) cross-sectional regressions of two-year future returns on trade persistence, where persistence is defined using $d_{i,t}^{Out}$ and $d_{i,t}^{Vol}$, respectively. The coefficient estimates are reported in Table IA.III and show that the estimates are comparable to those obtained using our original measure of net trade. We conclude that our results are not sensitive to the definition of institutional buying or selling activity.

B. *Alternative Herding Measures*

To reconcile our results with the existing literature on institutional herding, we first check whether a short-term version of our trade persistence measure yields the positive correlation with future short-term returns that is often found in the literature. Wermers (1999) examines returns to equally weighted portfolios of stocks ranked into quintiles of buy and sell herding. His measure of signed herding is based on Lakonishok, Shleifer, and Vishny (1992) and captures the imbalance in the number of institutions buying a stock as a proportion of all institutions actively trading the stock. We partially compare our results to Wermers (1999) using our data on institutional managers. We first separate stocks with positive and negative institutional net trade in quarter t, $d_{i,t}$, and rank the stocks in each group into quintiles. We then compute market-adjusted equally weighted quarterly returns for stocks heavily bought and stocks heavily sold by institutions. When

we truncate our time series to 1994 (the sample period studied in Wermers (1999) is 1975 to 1994), we find that the difference in returns between stocks heavily bought and stocks heavily sold is 1.15% after one quarter, 0.5% after two quarters, and becomes negative afterwards. While the two samples are not directly comparable, as they refer to different time periods, different institutional traders, and different measures of net trading, our empirical results are consistent with those of Wermers (1999). Wermers (1999) finds that the size-adjusted return differential is 2.25% in the first quarter, 1.35% in the second quarter, and not significant in the third and fourth quarters.

We next check whether a long-horizon version of commonly used one-period herding measures yields the negative correlation with future long-term returns that we find in our study. We adopt two widely used herding measures based on Lakonishok, Shleifer, and Vishny (1992). First, we consider the number of buyers of stock i in quarter t as a fraction of the total number of active traders in the stock:

$$p_{i,t} = \frac{\text{number of buyers}}{\text{numbers of buyers + number of sellers}}.$$

This variable represents a measure of trade imbalance. Each quarter, we rank $p_{i,t}$ into two groups and consider values of $p_{i,t}$ above the median as an imbalance of buys and values of $p_{i,t}$ below the median as an imbalance of sells.

We also use signed herding as defined in Wermers (1999). Specifically, we construct a measure of buy herding as

$$BHM_{i,t} = (\mid p_{i,t} - E[p_{i,t}] \mid) - AF_{i,t} \mid p_{i,t} > E[p_{i,t}],$$

and a measure of sell herding as

$$SHM_{i,t} = (\mid p_{i,t} - E[p_{i,t}] \mid) - AF_{i,t} \mid p_{i,t} < E[p_{i,t}],$$

where $p_{i,t}$ is the proportion of buyers among all institutions trading stock i in quarter t and $E[p_{i,t}]$ is the expected proportion of buys for stock i during quarter t, estimated as the fraction of all trades across all stocks that are buys during quarter t. $AF_{i,t}$ is an adjustment factor that allows for random variation around the expected proportion of buys and sells under the null hypothesis that institutions trade randomly and independently. This quantity is computed by assuming a binomial process for the number of buys for stock i and quarter t, where the parameters are n (the number of trades for each stock in each quarter) and p (the average proportion of all trades across all stocks that are buys during quarter t). The factor is computed separately for the buy and sell herding measures, conditional on $p_{i,t} > E[p_{i,t}]$ or $p_{i,t} < E[p_{i,t}]$. As in Wermers (1999) we require that a stock is traded by at least five institutions in any given quarter. We rank these measures into two groups to define different degrees of intensity of buy and sell herding.

We then construct measures of "herding persistence" by counting the number of consecutive quarters during which a stock exhibits buy or sell herding, using both the raw herding measure

$p_{i,t}$ and the signed herding measures $BHM_{i,t}$ and $SHM_{i,t}$. As with our original measure of trade persistence, we define herding persistence between -5 and 5. For trading persistence based on raw herding, a value of -5 indicates that a stock exhibits persistent sell herding (low $p_{i,t}$) for five or more consecutive quarters, and a value of 5 indicates that a stock exhibits buy herding (high $p_{i,t}$) for five or more consecutive quarters. For trading persistence based on the signed herding measures, a value of -5 indicates low buy or sell herding (low $BHM_{i,t}$ or low $SHM_{i,t}$) for five or more consecutive quarters, while a value of 5 indicates intense buy or sell herding (high $BHM_{i,t}$ or high $SHM_{i,t}$) for five or more consecutive quarters.

We next analyze long-term stock returns using the new persistence measures. We regress two-year future returns on past herding persistence and control variables. The Fama-MacBeth (1973) cross-sectional regression results are reported in Table IA.IV. The persistence measure based on raw herding shows a predictive ability that is comparable to our original measure of trade persistence and confirms the negative relation between herding persistence and stock returns. The coefficient is comparable to the estimate obtained in Table II of the published article, both in magnitude and statistical significance. Furthermore, for the signed herding measures, the persistence of intense buy herding predicts negative future returns, although not significantly. The persistence of intense sell herding, however, predicts positive and significant future returns. These results are consistent with the findings presented using our original trade persistence measure, and show that the link between trade persistence and returns is not specific to our definition of institutional trading.

III. CAPM Alphas

Table IA.V presents CAPM alphas for portfolios of different trade persistence (-5 to +5) and holding periods of three months to 30 months. The table also shows the return differentials between negative and positive persistence portfolios. Panel A presents value-weighted returns and Panel B presents equal-weighted returns. The return differentials are generally positive and significant. For a holding period of two years, for example, the value-weighted returns (Panel A) vary between 31 basis points and 54 basis points per month, depending on the trade persistence strategy considered. It is worth noting that these positive return differentials between sell and buy persistence are mostly due to the large and significant returns of stocks that have been persistently sold by institutional investors. For instance, the return differential for the (-3,3) strategy, 31 basis points, is due almost entirely to the corresponding return of the negative persistence portfolio, 25 basis points. Short-sale constraints would not limit the profitability of such a strategy, which earns most of its returns from buying stocks that institutions have been selling for a number of quarters in the past.

IV. January Returns

In this section we check that our results on the predictability of institutional trade persistence are not driven by a value benchmark misspecification issue (see Loughran (1997), for example). We perform both the portfolio and the regression tests after excluding the month of January from the computation of returns. Table IA.VI contains average monthly DGTW returns for trade persistence portfolios computed excluding January months and with January-only months. This table shows that non-January returns are very similar to those obtained using all calendar months (see Table III in the published article). If anything, the returns outside of January are slightly larger. The January-only returns are insignificant and generally negative. We interpret these findings as evidence that our results are not driven by a value benchmark misspecification issue.

Table IA.VII presents coefficient estimates for Fama-MacBeth (1973) regressions of two-year stock returns on the persistence of institutional trading and control variables after excluding January returns. We also estimate the same regressions for two separate sample periods, 1984 to 1993 and 1994 to 2004 (see Table II in the published article). The regression results for the entire sample period show that the coefficient on trade persistence is not significant, but the interaction term between persistence and institutional ownership is significant and of a similar magnitude to the estimate obtained using all calendar months. This finding implies that, for stocks with high levels of institutional ownership, excluding January months from the analysis does not alter the link between trade persistence and future returns. When we analyze the two halves of our sample period separately, the results confirm the pattern obtained with all calendar months. During the period 1983 to 1993 we find that trade persistence is significant and strong when interacted with institutional ownership. For the more recent half of the sample period, 1984 to 2004, the coefficient estimate on trade persistence is now significant while the interaction term is not important, suggesting that institutional trade persistence predicts return reversals for stocks of all levels of institutional ownership. As we observe for our main set of results, this finding may be related to the considerable growth in institutional ownership during the more recent sample period.

We note that, for the later sample period, the coefficient on book-to-market is no longer significant when we exclude January returns. Moreover, changes in analyst coverage are not important in explaining future returns. Therefore, when we exclude January months from the computation of stock returns, we find that trade persistence is the only significant variable that predicts the cross-section of future stock returns. Finally, our general finding that the predictability of trade persistence is stronger when institutional ownership is higher further suggests that the effect of trade persistence on returns is distinct from a value effect. As shown in Nagel (2005), the value effect is generally stronger for stocks with lower institutional ownership.

In summary, we find that i) our regression results are robust to excluding the month of January from the computation of stock returns, ii) our effect is stronger for high institutional ownership

stocks, and iii) our effect is stronger in the later subperiod. As all of these findings are in stark contrast to stylized facts about the value effect, we conclude that our results are not driven by a bad value benchmark problem but represent a distinct phenomenon.

V. Additional Results

In this section we present a set of tables containing descriptive statistics, further results on the predictability of institutional trade persistence, and further robustness tests. We describe these tables briefly. Table IA.VIII reports descriptive statistics on the sample of institutional investors used in our study. Table IA.IX contains estimates from cross-sectional regressions of future returns on institutional trade persistence; the dependent variable is the non-overlapping quarterly return of a stock measured over a period of one to eight quarters in the future. Table IA.X contains five-factor alphas (value-weighted) for trade persistence portfolios sorted by NYSE market capitalization; the returns are computed for the two sample periods 1983 to 1993 and 1994 to 2004. Table IA.XI displays coefficient estimates from predictive regressions of two-year stock returns on trade persistence and control variables, both by tercile of NYSE market capitalization and by subperiod. Finally, Table IA.XII reports one-year and two-year raw returns for trade persistence portfolios; the returns are computed for each year in the sample.

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Table IA.I

Adjusted Return Differentials for Institutional Trade Persistence Portfolios
Equally Weighted Portfolios

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$. The portfolios are equally weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. Five-factor alphas are estimated intercepts from the five-factor model, which includes the three Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. DGTW returns are measured using characteristic-matched benchmarks (size, book-to-market, and momentum) as in Daniel et al. (1997). Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Five-factor alphas (EW)										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.52***	0.46****	0.41***	0.42***	0.38***	0.38***	0.35***	0.34***	0.34***	0.34***
	(3.09)	(3.22)	(3.33)	(3.71)	(3.58)	(3.63)	(3.46)	(3.65)	(3.76)	(3.93)
(-4,4)	0.52**	0.50***	0.60***	0.50***	0.54***	0.48***	0.49***	0.48***	0.48***	0.44***
	(2.43)	(2.65)	(3.49)	(3.22)	(3.53)	(3.27)	(3.52)	(3.71)	(3.95)	(3.81)
(-5,5)	1.04***	0.92***	0.86***	0.79***	0.75***	0.73***	0.69***	0.66***	0.63***	0.59***
	(4.34)	(3.97)	(3.89)	(3.73)	(3.71)	(3.79)	(3.76)	(3.79)	(3.76)	(3.72)

Panel B: DGTW returns (EW)										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.13	0.17*	0.18**	0.25***	0.22***	0.21***	0.21***	0.21***	0.21***	0.19***
	(1.10)	(1.85)	(2.13)	(3.19)	(3.08)	(3.06)	(3.24)	(3.45)	(3.58)	(3.58)
(-4,4)	0.35**	0.33**	0.45***	0.38***	0.39***	0.39***	0.38***	0.36***	0.34***	0.31***
	(2.05)	(2.35)	(3.69)	(3.53)	(3.80)	(3.94)	(4.02)	(4.15)	(4.15)	(3.97)
(-5,5)	0.66***	0.62***	0.57***	0.52***	0.50***	0.48***	0.46***	0.45***	0.42***	0.39***
	(4.01)	(4.06)	(3.91)	(3.74)	(3.68)	(3.62)	(3.68)	(3.75)	(3.76)	(3.66)

Table IA.II

Characteristics of Persistence Portfolios Based on Alternative Measures of Institutional Net Trade

This table reports time-series averages of quarterly cross-sectional means and medians for characteristics of portfolios based on institutional trade persistence, constructed from alternative measures of institutional net trade. All variables are defined in Table I of the main article, except for net trade. The measures of net trade used in this analysis are as follows: $d_{i,t}^{Out}$ is the change in the number of shares of stock i in the institutional aggregate portfolio from the end of quarter $t-1$ to the end of quarter t, scaled by shares outstanding. $d_{i,t}^{Vol}$ is the change in the number of shares of stock i in the institutional aggregate portfolio from the end of quarter $t-1$ to the end of quarter t, scaled by trading volume.

$Persistence^{Out}$	Number of stocks	$d_{i,t}^{Out}$ (median)	Mkt Cap (mean)	Mkt Cap (median)	NYSE Cap Decile	B/M	Share Turnover	Inst. Ownership	Past Return
-5	178	-0.005	449.19	26.66	2.02	1.09	0.39	0.14	-0.024
-4	136	-0.008	800.66	46.09	2.57	1.16	0.46	0.19	-0.028
-3	258	-0.009	862.91	60.14	2.87	1.01	0.50	0.21	-0.034
-2	514	-0.010	1,003.58	80.31	3.23	0.90	0.53	0.25	-0.033
0	2256	0.002	1,094.86	95.31	3.57	0.74	0.54	0.28	-0.005
2	505	0.020	1,186.76	164.87	4.04	0.63	0.61	0.33	0.037
3	256	0.023	1,259.29	198.95	4.31	0.57	0.67	0.36	0.039
4	139	0.026	1,353.06	234.36	4.51	0.53	0.74	0.39	0.042
5	190	0.029	1,419.94	314.63	4.97	0.46	0.82	0.45	0.042

$Persistence^{Vol}$	Number of stocks	$d_{i,t}^{Vol}$ (median)	Mkt Cap (mean)	Mkt Cap (median)	NYSE Cap Decile	B/M	Share Turnover	Inst. Ownership	Past Return
-5	166	-0.017	730.06	29.62	2.32	1.04	0.49	0.17	-0.030
-4	137	-0.021	916.22	50.83	2.78	1.10	0.55	0.21	-0.035
-3	259	-0.024	989.95	63.75	3.04	1.01	0.57	0.23	-0.037
-2	518	-0.025	1,070.52	83.05	3.32	0.89	0.56	0.26	-0.036
0	2262	0.008	1,093.07	94.93	3.58	0.74	0.55	0.28	-0.003
2	510	0.059	1,116.51	150.51	3.95	0.64	0.57	0.32	0.039
3	258	0.063	1,100.79	177.32	4.14	0.58	0.60	0.34	0.039
4	139	0.065	1,136.12	203.52	4.25	0.56	0.63	0.36	0.042
5	181	0.069	1,251.10	250.11	4.54	0.52	0.65	0.40	0.038

Table IA.III

Cross-sectional Predictive Regressions of Long-term Stock Returns
Alternative Measures of Institutional Net Trade

This table reports coefficient estimates from predictive regressions of cumulative eight-quarter market-adjusted returns on past trade persistence, past returns, and control variables. The independent variables are defined in Tables I and II of the main article. Institutional trade persistence $P_{i,t}^{Out}$ is computed from net trade, where the change in shares is scaled by shares outstanding ($d_{i,t}^{Out}$). Institutional trade persistence $P_{i,t}^{Vol}$ is computed from net trade, where the change in shares is scaled by trading volume ($d_{i,t}^{Vol}$). The regression estimates are time-series averages of quarterly cross-sectional coefficients, following Fama-MacBeth (1973). Standard errors are adjusted for autocorrelation as in Newey-West (1987). t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

Shares Outstanding			Trading Volume		
$P_{i,t}^{Out}$	-0.018***	-0.023***	$P_{i,t}^{Vol}$	-0.018***	-0.023***
	(-4.50)	(-5.04)		(-3.63)	(-4.27)
$R_{i,t:t-15}$	-0.039*		$R_{i,t:t-15}$	-0.039*	
	(-1.83)			(-1.84)	
$R_{i,t-4:t-15}$		-0.020	$R_{i,t-4:t-15}$		-0.020
		(-1.28)			(-1.29)
$cap_{i,t}$	-0.038*	-0.038*	$cap_{i,t}$	-0.038*	-0.039*
	(-1.91)	(-1.88)		(-1.91)	(-1.89)
$bm_{i,t}$	0.045**	0.062***	$bm_{i,t}$	0.045**	0.063***
	(2.37)	(2.86)		(2.39)	(2.87)
$own_{i,t}$	-0.014	-0.011	$own_{i,t}$	-0.015	-0.012
	(-1.33)	(-1.10)		(-1.45)	(-1.23)
$turn_{i,t}$	0.033	0.021	$turn_{i,t}$	0.031	0.019
	(1.37)	(0.93)		(1.33)	(0.87)

Table IA.IV

Cross-sectional Predictive Regressions of Long-term Stock Returns
Alternative Measures of Herding

This table reports coefficient estimates from predictive regressions of cumulative eight-quarter market-adjusted returns on past trade persistence, past returns, and control variables. The independent variables are defined in Tables I and II of the main article, except for trade persistence. Institutional trade persistence $P_{i,t}$ is constructed using the following three alternative measures of herding: (1) *"p herding"*: Trade persistence is based on trade imbalance $p_{i,t}$, the ratio of buyers of stock i in quarter t to the total number of active traders in the stock. Buys and sells are defined each quarter relative to the median. (2) *"BHM herding"*: Trade persistence is based on the buy herding measure $BHM_{i,t}$. (3) *"SHM herding"*: Trade persistence is based on the sell herding measure $SHM_{i,t}$. The signed herding measures are constructed as in Wermers (1999) and are described in the text. Trade persistence varies between -5 and 5. For trade persistence based on trade imbalance, a value of -5 indicates that a stock exhibits persistent sell herding (low $p_{i,t}$) for five or more consecutive quarters, and a value of 5 indicates that a stock exhibits buy herding (high $p_{i,t}$) for five or more consecutive quarters. For trade persistence based on the signed herding measures, a value of -5 indicates low buy or sell herding (low $BHM_{i,t}$ or low $SHM_{i,t}$) for five or more consecutive quarters, while a value of 5 indicates intense buy or sell herding (high $BHM_{i,t}$ or high $SHM_{i,t}$) for five or more consecutive quarters. The regression estimates are time-series averages of quarterly cross-sectional coefficients, following Fama-MacBeth (1973). Standard errors are adjusted for autocorrelation as in Newey-West (1987). t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

	p herding		*BHM herding*		*SHM herding*	
$P_{i,t}$	-0.020***	-0.025***	-0.006	-0.009	0.011**	0.013**
	(-3.88)	(-3.46)	(-0.79)	(-1.05)	(2.00)	(2.15)
$R_{i,t:t-15}$	-0.019		-0.028		-0.013	
	(-0.95)		(-1.50)		(-0.61)	
$R_{i,t-4:t-15}$		-0.008		-0.020		-0.003
		(-0.54)		(-1.46)		(-0.17)
$cap_{i,t}$	-0.025	-0.026	-0.033	-0.033	-0.024	-0.025
	(-1.15)	(-1.13)	(-1.57)	(-1.46)	(-1.02)	(-1.01)
$bm_{i,t}$	0.091**	0.103**	0.071	0.090	0.101**	0.111**
	(2.43)	(2.44)	(1.36)	(1.56)	(2.90)	(2.83)
$own_{i,t}$	-0.017*	-0.016	-0.002	0.000	-0.028**	-0.027**
	(-1.64)	(-1.61)	(-0.17)	(0.01)	(-2.10)	(-2.10)
$turn_{i,t}$	0.030	0.021	0.012	0.001	0.047*	0.039*
	(1.39)	(1.03)	(0.58)	(0.04)	(1.87)	(1.69)

Table IA.V

Estimated CAPM Alphas for Institutional Trade Persistence Portfolios

This table reports average monthly estimated intercepts (alphas) from the CAPM model for portfolios of stocks persistently traded by institutions for n consecutive quarters. Negative persistence numbers denote portfolios of stocks sold by institutions for n consecutive quarters, positive persistence numbers denote portfolios of stocks bought by institutions for n consecutive quarters. Persistence=0 denotes portfolios of stocks bought or sold for one quarter. Persistence=$(-n, n)$ denotes return differentials between stocks sold by institutions for n quarters and stocks bought by institutions for n quarters. Holding periods are three months to 30 months. Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively. The portfolios are equally weighted in Panel A and value-weighted in Panel B.

Panel A: Equally weighted portfolios										
	Holding period									
Persistence	3 m	6 m	9 m	12 m	15 m	18 m	21 m	24 m	27 m	30 m
-5	0.70**	0.74**	0.74***	0.76***	0.77***	0.76***	0.75***	0.75***	0.73***	0.72***
	(2.29)	(2.50)	(2.63)	(2.78)	(2.92)	(2.90)	(2.91)	(2.95)	(2.96)	(2.96)
-4	0.39	0.42	0.52**	0.48**	0.57**	0.56**	0.57**	0.56**	0.57**	0.56**
	(1.34)	(1.56)	(2.01)	(1.96)	(2.32)	(2.37)	(2.41)	(2.47)	(2.52)	(2.53)
-3	0.27	0.31	0.35	0.42*	0.40*	0.46**	0.48**	0.48**	0.48**	0.49**
	(1.03)	(1.21)	(1.46)	(1.81)	(1.80)	(2.05)	(2.18)	(2.19)	(2.26)	(2.33)
-2	0.11	0.18	0.24	0.27	0.31	0.31	0.33	0.35*	0.36*	0.37*
	(0.50)	(0.82)	(1.08)	(1.27)	(1.48)	(1.47)	(1.61)	(1.71)	(1.75)	(1.82)
0	0.11	0.12	0.14	0.16	0.18	0.20	0.21	0.22	0.23	0.24
	(0.55)	(0.63)	(0.73)	(0.86)	(0.95)	(1.04)	(1.09)	(1.17)	(1.26)	(1.33)
2	0.13	0.10	0.07	0.06	0.07	0.09	0.11	0.12	0.13	0.15
	(0.65)	(0.53)	(0.42)	(0.34)	(0.38)	(0.50)	(0.60)	(0.68)	(0.76)	(0.85)
3	0.07	0.01	-0.01	-0.01	-0.01	0.02	0.04	0.04	0.06	0.07
	(0.37)	(0.07)	(-0.04)	(-0.03)	(-0.04)	(0.12)	(0.24)	(0.24)	(0.33)	(0.42)
4	-0.02	-0.06	-0.12	-0.12	-0.11	-0.09	-0.09	-0.08	-0.07	-0.04
	(-0.12)	(-0.32)	(-0.63)	(-0.65)	(-0.61)	(-0.53)	(-0.53)	(-0.45)	(-0.40)	(-0.21)
5	-0.28	-0.24	-0.25	-0.26	-0.25	-0.25	-0.24	-0.22	-0.19	-0.15
	(-1.43)	(-1.29)	(-1.40)	(-1.41)	(-1.38)	(-1.43)	(-1.33)	(-1.22)	(-1.05)	(-0.87)
(-3,3)	0.20	0.29*	0.35**	0.42***	0.41***	0.44***	0.44***	0.43***	0.43***	0.42***
	(0.98)	(1.73)	(2.42)	(3.33)	(3.59)	(4.04)	(4.24)	(4.45)	(4.58)	(4.81)
(-4,4)	0.41*	0.48**	0.63***	0.60***	0.67***	0.66***	0.66***	0.64***	0.64***	0.60***
	(1.74)	(2.29)	(3.45)	(3.66)	(4.29)	(4.40)	(4.62)	(4.83)	(5.12)	(5.08)
(-5,5)	0.97***	0.98***	1.00***	1.02***	1.02***	1.01***	0.99***	0.96***	0.92***	0.87***
	(3.52)	(3.90)	(4.29)	(4.63)	(4.88)	(5.06)	(5.16)	(5.30)	(5.31)	(5.33)

Table IA.V, continued

Estimated CAPM Alphas for Institutional Trade Persistence Portfolios

Panel B: Value-weighted portfolios										
	Holding period									
Persistence	3 m	6 m	9 m	12 m	15 m	18 m	21 m	24 m	27 m	30 m
-5	0.21	0.39**	0.35**	0.32**	0.30**	0.30**	0.32**	0.31**	0.33**	0.32**
	(1.19)	(2.37)	(2.30)	(2.10)	(2.00)	(2.10)	(2.28)	(2.33)	(2.46)	(2.46)
-4	0.14	0.09	0.24*	0.19*	0.23**	0.24**	0.23**	0.27***	0.24***	0.28***
	(0.67)	(0.58)	(1.89)	(1.65)	(2.14)	(2.49)	(2.53)	(3.13)	(2.94)	(3.50)
-3	0.19	0.19	0.23**	0.32***	0.28***	0.26***	0.25***	0.25***	0.24***	0.23***
	(1.16)	(1.45)	(2.09)	(3.17)	(2.95)	(2.99)	(3.13)	(3.18)	(3.24)	(3.21)
-2	0.11	0.13	0.12	0.13*	0.19***	0.17***	0.16***	0.16***	0.16***	0.16***
	(0.93)	(1.29)	(1.46)	(1.83)	(2.82)	(2.76)	(2.72)	(2.94)	(3.05)	(3.00)
0	0.00	0.01	0.00	0.02	0.02	0.03	0.03	0.03	0.04	0.04
	(0.05)	(0.21)	(0.14)	(0.55)	(0.68)	(0.81)	(0.98)	(0.96)	(1.18)	(1.28)
2	-0.16	-0.13	-0.05	-0.05	-0.08	-0.04	-0.03	0.02	0.01	0.00
	(-1.20)	(-1.43)	(-0.73)	(-0.76)	(-1.55)	(-0.79)	(-0.61)	(0.39)	(0.34)	(-0.05)
3	-0.15	-0.07	-0.07	-0.14*	-0.13	-0.12	-0.05	-0.06	-0.06	-0.06
	(-0.89)	(-0.65)	(-0.68)	(-1.67)	(-1.56)	(-1.53)	(-0.70)	(-0.91)	(-0.97)	(-0.96)
4	0.04	-0.10	-0.13	-0.12	-0.13	-0.08	-0.09	-0.11	-0.11	-0.11
	(0.25)	(-0.69)	(-1.07)	(-1.14)	(-1.35)	(-0.85)	(-1.02)	(-1.27)	(-1.37)	(-1.32)
5	-0.19	-0.25	-0.28*	-0.26*	-0.23	-0.25*	-0.23*	-0.22*	-0.24*	-0.25**
	(-0.97)	(-1.45)	(-1.68)	(-1.64)	(-1.52)	(-1.70)	(-1.64)	(-1.65)	(-1.79)	(-1.98)
(-3,3)	0.34	0.26	0.30*	0.46***	0.41***	0.38***	0.30***	0.31***	0.30***	0.29***
	(1.36)	(1.48)	(1.87)	(3.23)	(3.02)	(3.13)	(2.74)	(2.90)	(2.91)	(2.89)
(-4,4)	0.09	0.18	0.36**	0.31*	0.36**	0.32**	0.32**	0.38***	0.35***	0.38***
	(0.32)	(0.82)	(1.91)	(1.76)	(2.21)	(2.10)	(2.24)	(2.78)	(2.74)	(3.09)
(-5,5)	0.40	0.64**	0.63**	0.58**	0.53**	0.55**	0.55**	0.54**	0.56**	0.57***
	(1.31)	(2.29)	(2.40)	(2.24)	(2.08)	(2.24)	(2.28)	(2.31)	(2.46)	(2.59)

Table IA.VI

DGTW Return Differentials for Institutional Trade Persistence Portfolios Excluding January Months and January-only Months

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$. The portfolios are value-weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. DGTW returns are measured using characteristic-matched benchmarks (size, book-to-market, and momentum) as in Daniel et al. (1997). In Panel A returns are computed excluding January months; in Panel B returns are for January only. Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Excluding January months										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.00	0.10	0.12	0.24**	0.22**	0.20**	0.19**	0.20***	0.20***	0.19***
	(0.02)	(0.83)	(1.09)	(2.42)	(2.47)	(2.43)	(2.41)	(2.71)	(2.85)	(2.70)
(-4,4)	0.22	0.14	0.21	0.15	0.17	0.20*	0.23**	0.26**	0.23**	0.24***
	(0.93)	(0.79)	(1.45)	(1.18)	(1.50)	(1.83)	(2.20)	(2.57)	(2.44)	(2.72)
(-5,5)	-0.04	0.09	0.15	0.15	0.15	0.19	0.22	0.20	0.20	0.20
	(-0.20)	(0.48)	(0.85)	(0.88)	(0.88)	(1.13)	(1.34)	(1.27)	(1.34)	(1.37)
Panel B: January-only months										
	Holding period									
Persistence	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m
(-3,3)	0.42	-0.22	-0.40	-0.22	-0.23	-0.17	-0.25	-0.24	-0.29	-0.26
	(0.98)	(-1.02)	(-1.46)	(-0.74)	(-0.73)	(-0.56)	(-0.95)	(-0.97)	(-1.32)	(-1.13)
(-4,4)	-0.45	-0.75	-0.52	-0.39	-0.08	-0.13	-0.26	-0.35	-0.27	-0.25
	(-0.87)	(-1.40)	(-1.03)	(-0.87)	(-0.22)	(-0.38)	(-0.72)	(-1.05)	(-0.87)	(-0.93)
(-5,5)	-0.47	0.19	0.28	0.20	0.02	0.09	0.12	0.12	0.17	0.20
	(-0.55)	(0.25)	(0.41)	(0.26)	(0.02)	(0.12)	(0.17)	(0.19)	(0.28)	(0.34)

Table IA.VII

Cross-sectional Predictive Regressions of Long-term Stock Returns Excluding January Months

This table reports Fama-MacBeth (1973) coefficient estimates from predictive regressions of cumulative eight-quarter market-adjusted returns, constructed after excluding January returns. Past returns are measured during four years up to quarter t ($R_{i,t-15:t}$) or during three years skipping a year before quarter t ($R_{i,t-15:t-4}$). The independent variables are described in Tables I and II of the main article. All independent variables are standardized using their quarterly cross-sectional mean and standard deviation. t-statistics (in parentheses) are adjusted following Newey-West (1987). *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

	Entire sample		**1983 to 1993**		**1994 to 2004**	
$Pers_{i,t}$	-0.002	-0.003	0.003	0.004	-0.009**	-0.012**
	(-0.71)	(-0.90)	(0.78)	(1.03)	(-2.49)	(-2.45)
$Pers\_Rown_{i,t}$	-0.010**	-0.010**	-0.018***	-0.018**	-0.001	-0.001
	(-2.17)	(-2.09)	(-2.68)	(-2.54)	(-0.23)	(-0.20)
$R_{i,t-15:t}$	0.008		0.029		-0.017	
	(0.48)		(1.50)		(-0.77)	
$R_{i,t-15:t-4}$		-0.004		0.000		-0.009
		(-0.37)		(-0.00)		(-0.61)
$cap_{i,t}$	0.004	0.005	0.028	0.029	-0.023	-0.023
	(0.24)	(0.30)	(1.40)	(1.50)	(-0.86)	(-0.86)
$bm_{i,t}$	0.026	0.005	0.015	-0.024	0.038	0.040
	(0.60)	(0.11)	(0.20)	(-0.31)	(1.14)	(1.30)
$own_{i,t}$	0.005	0.004	0.006	0.004	0.004	0.005
	(0.50)	(0.42)	(0.59)	(0.38)	(0.21)	(0.25)
$turn_{i,t}$	0.006	0.005	-0.017	-0.016	0.033	0.029
	(0.34)	(0.28)	(-1.09)	(-0.95)	(1.11)	(0.95)
$dcoverage_{i,t}$	-0.015***	-0.013***	-0.025***	-0.021**	-0.004	-0.005
	(-2.78)	(-2.60)	(-3.07)	(-2.56)	(-0.99)	(-1.17)
$issuance_{i,t}$	-0.009*	-0.008	-0.011**	-0.006	-0.008	-0.012
	(-1.79)	(-1.17)	(-2.33)	(-1.13)	(-0.72)	(-0.79)
$e/p_{i,t}$	-0.022	-0.014	-0.004	0.007	-0.043	-0.039
	(-0.91)	(-0.54)	(-0.16)	(0.22)	(-1.07)	(-0.90)
$cf/p_{i,t}$	0.013	0.011	-0.025	-0.030	0.057	0.058
	(0.45)	(0.36)	(-0.96)	(-1.07)	(1.18)	(1.16)
$s/p_{i,t}$	0.030	0.033	0.046**	0.047**	0.011	0.016
	(0.96)	(1.02)	(2.25)	(2.14)	(0.19)	(0.26)
$e\ growth_{i,t}$	0.034	0.026	0.106	0.086	-0.050	-0.043
	(0.48)	(0.41)	(1.57)	(1.61)	(-0.39)	(-0.36)

Table IA.VIII
Descriptive Statistics: Sample of Institutional Investors

The sample consists of quarterly observations for firms listed on NYSE, Amex, and NASDAQ during the period 1983 to 2004. Each quarter, we compute the total number of managers reporting their holdings in each security; the mean and median value of managers' equity holdings; the aggregate value managed by all institutions; and the share of market value represented by the aggregate institutional portfolio (calculated as the ratio between the value of stocks in the institutional portfolio and the value of all stocks in CRSP). Portfolio turnover for manager j is calculated as the sum of the absolute values of buys and sells in stock i in a given quarter, divided by the value of the manager's stock holdings: $Turnover_t^j = \frac{\sum_i |n_t^{i,j} - n_{t-1}^{i,j}| \, p_t^i}{\sum_i n_t^{i,j} p_t^i}$. This table reports summary statistics for the last quarter of each year in the sample.

Year	Number of managers	Holdings per mgr		Aggregate stock holdings ($bill.)	Market share %	Turnover	
		Mean ($mill.)	Median ($mill.)			Mean	Median
1983	640	762.19	257.55	487.80	28	0.30	0.21
1984	692	704.73	217.93	487.68	29	0.29	0.19
1985	768	854.08	261.46	655.93	31	0.33	0.23
1986	809	918.17	266.37	742.80	32	0.34	0.24
1987	881	851.33	225.29	750.02	32	0.35	0.25
1988	882	947.19	248.48	835.42	33	0.26	0.18
1989	927	1,093.68	284.94	1,024.78	34	0.36	0.23
1990	976	998.08	234.83	974.13	34	0.27	0.17
1991	1,009	1,331.40	291.49	1,343.38	36	0.31	0.20
1992	1,098	1,425.03	285.46	1,564.68	38	0.28	0.19
1993	1,044	1,603.42	297.79	1,673.97	36	0.44	0.21
1994	1,135	1,619.14	281.58	1,837.72	40	0.29	0.20
1995	1,299	2,049.37	299.68	2,662.13	42	0.35	0.24
1996	1,307	2,508.74	327.86	3,278.92	43	0.50	0.24
1997	1,461	3,062.10	372.76	4,473.73	45	0.34	0.24
1998	1,629	3,540.10	345.03	5,766.82	47	0.40	0.25
1999	1,703	4,386.91	405.83	7,470.91	47	0.39	0.25
2000	1,899	3,989.36	324.21	7,575.79	53	0.39	0.25
2001	1,751	3,864.52	319.54	6,766.77	53	0.36	0.21
2002	1,912	2,988.33	231.20	5,713.68	58	0.42	0.21
2003	2,023	3,581.46	309.92	7,245.30	56	0.37	0.23
2004	2,056	4,078.51	335.25	8,385.41	64	0.30	0.20
Average	1,133	2,108.43	301.88				

Table IA.IX

Cross-sectional Predictive Regressions of Quarterly Stock Returns

This table reports coefficient estimates from predictive regressions of stock returns on past trade persistence, past returns, and control variables. The dependent variables are the non-overlapping quarterly stock returns during eight quarters from $t+1$ to $t+8$ (R_{Q1} to R_{Q8}). Past returns are measured during four years up to quarter t ($R_{i,t:t-15}$) or during three years skipping a year before quarter t ($R_{i,t-4:t-15}$). All variables are defined in Tables I and II of the main article. The regression estimates are time-series averages of quarterly cross-sectional coefficients, following Fama-MacBeth (1973). Standard errors are adjusted for autocorrelation as in Newey-West (1987). t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

	R_{Q1}	R_{Q2}	R_{Q3}	R_{Q4}	R_{Q5}	R_{Q6}	R_{Q7}	R_{Q8}
$P_{i,t}$	-0.001	-0.001	-0.002**	-0.002**	-0.003***	-0.003***	-0.002**	-0.001
	(-0.63)	(-1.31)	(-2.33)	(-2.00)	(-2.78)	(-2.63)	(-2.45)	(-1.57)
$R_{i,t:t-15}$	-0.003	-0.003	-0.004	-0.004	-0.005	-0.003	-0.004	-0.004
	(-0.76)	(-0.86)	(-1.15)	(-1.28)	(-1.47)	(-1.01)	(-1.35)	(-1.42)
$cap_{i,t}$	-0.003	-0.004	-0.005	-0.005	-0.004	-0.004	-0.004	-0.005
	(-0.93)	(-1.22)	(-1.34)	(-1.49)	(-1.10)	(-1.32)	(-1.27)	(-1.40)
$bm_{i,t}$	0.002	0.000	-0.001	0.002	0.007***	0.004	0.006	0.001
	(0.90)	(-0.15)	(-0.44)	(0.80)	(2.91)	(1.54)	(1.39)	(0.47)
$own_{i,t}$	0.000	0.000	0.000	0.000	-0.001	0.000	0.000	0.000
	(-0.03)	(0.11)	(-0.20)	(0.13)	(-0.53)	(-0.17)	(-0.19)	(-0.17)
$turn_{i,t}$	0.001	-0.001	0.001	0.001	0.004	0.002	0.003	0.005
	(0.32)	(-0.19)	(0.16)	(0.36)	(1.13)	(0.61)	(0.85)	(1.09)
$P_{i,t}$	-0.001	-0.002	-0.003***	-0.002**	-0.004***	-0.003***	-0.003***	-0.002*
	(-0.95)	(-1.55)	(-2.66)	(-2.50)	(-3.01)	(-2.66)	(-2.63)	(-1.89)
$R_{i,t-4:t-15}$	-0.007**	-0.005*	-0.003	0.000	-0.001	0.001	0.000	0.000
	(-2.40)	(-1.69)	(-0.92)	(-0.16)	(-0.27)	(0.38)	(0.19)	(0.05)
$cap_{i,t}$	-0.001	-0.003	-0.004	-0.006	-0.004	-0.005	-0.005	-0.005
	(-0.43)	(-0.89)	(-1.20)	(-1.53)	(-1.25)	(-1.43)	(-1.34)	(-1.53)
$bm_{i,t}$	0.002	0.000	-0.001	0.003	0.010***	0.007**	0.008*	0.004
	(0.89)	(0.00)	(-0.25)	(1.13)	(3.27)	(2.13)	(1.74)	(1.26)
$own_{i,t}$	0.000	0.000	0.000	0.001	-0.001	0.000	0.000	0.000
	(-0.12)	(0.14)	(-0.13)	(0.31)	(-0.51)	(-0.04)	(0.07)	(0.16)
$turn_{i,t}$	0.001	-0.002	-0.001	0.000	0.003	0.001	0.001	0.004
	(0.25)	(-0.41)	(-0.28)	(-0.12)	(0.92)	(0.30)	(0.38)	(0.77)

Table IA.X

Five-factor Alphas for Institutional Trade Persistence Portfolios By NYSE Market Capitalization and Subperiods

This table reports average monthly return differentials between portfolios of stocks persistently sold by institutions for n quarters and portfolios of stocks persistently bought by institutions for n quarters $(-n, n)$ during two sample periods of equal length: 1983 to 1993 and 1994 to 2004. Portfolios are value-weighted. Institutional trade persistence is measured over three, four, and five or more quarters. Holding periods are three months to 30 months. Five-factor alphas are estimated intercepts from the five-factor model, which includes the three Fama-French (1993) factors, the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor. Cap is the tercile of NYSE market capitalization to which the stock belongs in any given month. Estimates are reported in % per month. t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively.

		1983 to 1993						1994 to 2004					
		Holding period						Holding period					
Cap	Pers	3m	6m	12m	18m	24m	30m	3m	6m	12m	18m	24m	30m
	(-3,3)	-0.41*	-0.15	-0.03	-0.12	-0.05	0.01	0.18	0.21	0.51***	0.47***	0.52***	0.53***
		(-1.80)	(-0.84)	(-0.23)	(-1.01)	(-0.42)	(0.08)	(0.73)	(1.11)	(3.31)	(3.43)	(4.48)	(5.38)
1	(-4,4)	-0.20	-0.08	-0.06	-0.11	0.01	0.06	-0.50	0.24	0.62***	0.78***	0.73***	0.63***
		(-0.63)	(-0.29)	(-0.26)	(-0.54)	(0.04)	(0.37)	(-1.34)	(0.84)	(2.88)	(4.13)	(4.53)	(4.44)
	(-5,5)	0.17	0.17	0.16	0.26	0.36	0.39*	0.97***	0.98***	1.09***	1.14***	0.94***	0.84***
		(0.52)	(0.53)	(0.55)	(0.98)	(1.52)	(1.87)	(2.61)	(3.21)	(4.46)	(4.87)	(4.32)	(4.44)
	(-3,3)	-0.18	0.01	-0.09	-0.02	0.01	-0.01	0.59**	0.63***	0.56***	0.48***	0.35***	0.30***
		(-0.74)	(0.03)	(-0.64)	(-0.17)	(0.09)	(-0.09)	(2.12)	(3.08)	(3.50)	(3.72)	(3.09)	(3.01)
2	(-4,4)	0.01	-0.34	-0.17	-0.13	0.08	0.02	0.83**	0.54*	0.51**	0.22	0.22	0.23
		(0.03)	(-1.43)	(-1.01)	(-0.80)	(0.48)	(0.15)	(2.18)	(1.82)	(2.26)	(1.19)	(1.30)	(1.45)
	(-5,5)	0.13	0.08	-0.01	0.00	-0.01	-0.01	1.78***	1.36***	0.87***	0.57**	0.48**	0.34*
		(0.32)	(0.23)	(-0.04)	(-0.01)	(-0.04)	(-0.07)	(4.17)	(3.64)	(3.16)	(2.54)	(2.40)	(1.80)
	(-3,3)	0.49*	0.28	0.04	-0.04	0.05	0.09	0.82**	0.61**	0.84***	0.54***	0.26*	0.21
		(1.76)	(1.37)	(0.26)	(-0.36)	(0.49)	(0.90)	(2.12)	(2.40)	(3.89)	(2.95)	(1.68)	(1.49)
3	(-4,4)	0.27	-0.21	-0.11	-0.05	0.11	0.11	-0.20	0.47	0.39	0.26	0.32	0.40*
		(0.59)	(-0.64)	(-0.48)	(-0.26)	(0.65)	(0.70)	(-0.40)	(1.31)	(1.39)	(1.06)	(1.37)	(1.95)
	(-5,5)	-0.98**	-0.50	-0.45	-0.19	-0.19	-0.14	1.00**	1.00**	0.77**	0.36	0.24	0.16
		(-2.20)	(-1.33)	(-1.38)	(-0.65)	(-0.73)	(-0.59)	(2.18)	(2.50)	(2.19)	(1.15)	(0.84)	(0.62)

Table IA.XI

Cross-sectional Predictive Regressions of Long-term Stock Returns By NYSE Market Capitalization and Subperiods

This table reports coefficient estimates from predictive regressions of cumulative eight-quarter market-adjusted returns on past trade persistence, past returns, and control variables. All variables are defined in Tables I and II of the main article. The regressions are estimated for three subsamples of stocks belonging to terciles of market capitalization defined using NYSE cutoff points. The regression estimates are obtained from quarterly cross-sectional regressions and then averaged over time, as in Fama-MacBeth (1973). Standard errors are adjusted for autocorrelation as in Newey-West (1987). t-statistics are in parentheses. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level, respectively. Panel A presents estimates for the entire sample period; Panel B reports estimates for the two subperiods 1983 to 1993 and 1994 to 2004.

Entire sample						
Cap	1		2		3	
$P_{i,t}$	-0.019***	-0.025***	-0.008	-0.011*	-0.001	-0.002
	(-3.53)	(-4.66)	(-1.35)	(-1.66)	(-0.12)	(-0.31)
$R_{i,t:t-15}$	-0.051**		-0.006		0.006	
	(-2.20)		(-0.25)		(0.27)	
$R_{i,t-4:t-15}$		-0.022		0.000		0.002
		(-1.32)		(-0.00)		(0.13)
$cap_{i,t}$	-0.139***	-0.145***	-0.024	-0.024	0.015	0.014
	(-4.13)	(-4.26)	(-0.97)	(-0.97)	(0.53)	(0.50)
$bm_{i,t}$	0.013	0.034*	0.132***	0.145**	0.197**	0.201**
	(0.62)	(1.67)	(2.93)	(2.54)	(2.45)	(2.45)
$own_{i,t}$	-0.020	-0.012	0.001	0.002	-0.006	-0.006
	(-1.28)	(-0.88)	(0.10)	(0.19)	(-0.49)	(-0.48)
$turn_{i,t}$	0.046	0.030	0.025	0.018	0.033	0.031
	(1.23)	(0.83)	(1.33)	(1.00)	(1.29)	(1.19)

	1983 to 1993			1994 to 2004		
Cap	1	2	3	1	2	3
$P_{i,t}$	-0.011	0.001	0.005	-0.029***	-0.018**	-0.008
	(-1.38)	(0.11)	(0.59)	(-5.63)	(-2.22)	(-0.88)
$R_{i,t:t-15}$	-0.036	0.007	0.011	-0.068***	-0.021	0.000
	(-0.98)	(0.23)	(0.39)	(-2.76)	(-0.68)	(-0.01)
$cap_{i,t}$	-0.124***	0.027	0.020	-0.156***	-0.082**	0.009
	(-2.66)	(1.23)	(0.97)	(-3.23)	(-2.45)	(0.15)
$bm_{i,t}$	0.026	0.087**	0.242*	-0.002	0.184**	0.145**
	(1.60)	(2.31)	(1.79)	(-0.05)	(2.19)	(2.08)
$own_{i,t}$	0.002	0.007	0.014	-0.045***	-0.006	-0.028
	(0.09)	(0.59)	(1.29)	(-3.44)	(-0.56)	(-1.50)
$turn_{i,t}$	-0.004	0.000	-0.001	0.106	0.056*	0.072
	(-0.21)	(-0.03)	(-0.06)	(1.48)	(1.71)	(1.53)

Table IA.XII

Return Differentials for Institutional Trade Persistence Portfolios, By Year

This table reports cumulative return differentials between portfolios of stocks persistently sold by institutions for n quarters and stocks persistently bought by institutions for n quarters $(-n, n)$. The portfolios are equally weighted. The cumulative returns in the table are sums of quarterly returns over one-year and two-year periods (Hold), averaged over a given year.

Hold	Pers	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	(-5,5)	0.049	0.095	0.113	0.085	0.020	-0.050	0.050	0.211	0.302	0.075	0.138
2 yr	(-4,4)	0.109	-0.028	-0.040	0.126	-0.021	-0.047	-0.017	0.165	0.314	0.007	0.084
	(-3,3)	0.038	-0.108	-0.032	0.066	-0.003	-0.040	-0.113	0.159	0.184	0.044	0.061
	(-5,5)	0.109	0.018	0.019	0.078	0.022	-0.020	-0.094	0.026	0.174	0.005	0.088
1 yr	(-4,4)	0.077	-0.049	-0.080	0.108	-0.039	-0.059	-0.084	0.013	0.163	0.001	0.062
	(-3,3)	0.045	-0.085	-0.046	0.046	-0.006	-0.021	-0.050	0.058	0.072	0.027	0.052

Hold	Pers	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	(-5,5)	0.004	0.108	0.161	0.092	0.173	0.206	0.632	0.323	0.338	0.275	0.043
2 yr	(-4,4)	0.079	0.129	0.097	0.091	0.176	0.025	0.491	0.154	0.233	0.219	0.041
	(-3,3)	0.088	0.055	0.076	0.030	0.129	-0.009	0.366	0.074	0.223	0.148	0.078
	(-5,5)	0.049	0.078	0.096	0.053	0.053	0.051	0.425	0.216	0.281	0.293	0.036
1 yr	(-4,4)	0.035	0.060	0.049	0.003	0.120	-0.083	0.289	0.074	0.184	0.220	0.046
	(-3,3)	0.040	0.020	0.034	0.021	0.039	-0.112	0.252	0.025	0.198	0.148	0.033