Institutional trading momentum and mispricing*

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ABSTRACT

I consider a setting where financial institutions are constantly changing their holdings, and as a result, stocks experience trends in ownership where institutional holdings are generally increasing or decreasing, in other words, there is "institutional trading momentum." For each stock, I decompose institutional ownership into a level, slope, and residual component. I find that the level and slope components are highly persistent, while the residual component is transient. I find that there is positive relation between the persistent components and returns and mean-reversion in both ownership and returns in the transient component. I construct a trading strategy on institutional trading momentum (ITM), and find that the low-high ITM strategy earns a positive and statistically significant Fama-French alpha. Overall, these results suggest that the trades of financial institutions push prices away from fundamentals.

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Since the 1980s, institutional ownership of equity securities has been increasing over time.[1] This has raised the concern that if a large enough group of financial institutions were to trade in the same direction, this could result in prices being pushed away from fundamentals, and thus, financial institutions could be destabilizing to the equity markets. A large literature has emerged investigating whether the aggregate trades of financial institutions into and out of securities results in prices being pushed away from fundamentals. If financial institutions were destabilizing to the stock market then there should be a reversal in returns following a period when financial institutions heavily buy or sell a stock, however, this literature generally finds that there is a continuation in returns following heavy institutional trading pressure.[2] Recently, Dasgupta et al. (2011) suggested that financial institutions can be net buyers or sellers over consecutive periods. They develop a novel measure of institutional trading which counts the number of consecutive quarters that a security is bought or sold in net and find that following a period of net buying or selling over 3 to 5 quarters, there is a reversal in returns in the long-run.

In this paper, I entertain the notion that there are trends in institutional ownership. That is to say, there are periods where the holdings of financial institutions in a particular security are generally increasing or decreasing, which I will refer to as "institutional trading momentum." Given that there could be institutional trading momentum in the stock market, if the trades of financial institutions push prices in the direction of their trades, i.e. buy trades push prices up and sell trades push prices down, then there should be positive returns when institutional ownership is trending upwards and negative returns when institutional ownership is trending downwards. Thus, the extant literature could be finding a positive relation between institutional demand and returns because on average heavy buying occurs during an upward trend in institutional ownership and heavy selling occurs during a downward trend in institutional ownership. Further, when institutional ownership deviates from its current trend, then this could push institutional ownership out of equilibrium, which could lead to a reversion back to its trend in the future. Therefore, there could a reversal in ownership and returns following a period where institutional ownership has deviated from its trend.

[1] This trend in institutional ownership was previously documented in Gompers and Metrick (2001)).

[2] See for example Lakonishok et al. (1992), Nofsinger and Sias (1999), Wermers (1999), and Sias (2004).

There are a number of different ways that institutional demand is measured in the extant literature. One measure of institutional demand that is used is the Lakonishok et al. (1992) herding measure which measures the number of mutual funds buying a certain security.[3] The Lakonishok et al. (1992) measure takes into account whether mutual funds are on average buyers or sellers in a given quarter. Another institutional demand measure used in the literature is the proportion of institutions that increase their holdings in a security, i.e. number of institutions buying scaled by total number of institutions that are buyers and sellers. Using the proportion of institutions increasing their demand for a security, Sias (2004) finds a positive relation between institutional demand and returns over the following year. Similarly, some studies use the change in institutional ownership to assess whether there is a positive relation between institution trading and short-term returns (see for example Nofsinger and Sias (1999)). While these measures capture the trades of financial institutions over a single period, they do not take into account whether or not financial institutions have been net buyers or sellers over consecutive periods and they do not control for institutional trading momentum, that is, they do not control for general upward or downward trends in institutional ownership. Further the measures that rely on the proportion of traders that are buyers do not control for the magnitude of those trades. The proportion of buyers does not necessarily reflect the net change in the holdings of financial institutions. There could be a large number of buyers purchasing a small number of shares and a small number of sellers selling a large number of shares, and vice versa.

Recently, Dasgupta et al. (2011) introduced a new measure of institutional demand, trade persistence. Their persistence measure counts the number of consecutive quarters that financial institutions either increased or decreased their holdings in a security over the most recent 3 to 5 quarters. They provide evidence that financial institutions can be net buyers or sellers over consecutive periods, however, their measure does not measure the magnitude of these trades. The persistence measure counts the number of consecutive quarters that a security was traded in one direction, but it does not measure the magnitude of those trades. Furthermore, these institutional demand measures do not account for institutional trading momentum. One potential scenario that is not accounted for is whether the trades of financial institutions are a continuation of or a

[3] The Lakonishok et al. (1992) measure was previously used in Puckett and Yan (2008) and Wermers (1999) among others.

deviation from the existing trend. Consider a scenario where institutions buy 10 million shares of Apple this period, sell 1,000 shares the next period, and buy an additional 15 million shares of Apple the following period. If the purchase of 15 million shares is just a continuation of the existing trend, then there would likely be a continuation in returns going into the future. However, if the purchase of the additional 15 million shares is a deviation from the current trend, then this could be unexpected buying pressure, which could push prices away from fundamentals, and there would likely be a reversal in ownership and returns in the future as ownership reverts back to its original trend. Therefore, it seems reasonable to control for trends in institutional ownership.

I explicitly control for trends in institutional ownership by decomposing institutional ownership into its level, slope, and residual components using the Hodrick-Prescott (1997) filter.[4] The slope component measures the current direction and magnitude of the current trend. If trends in ownership are persistent and the trades of financial institutions push prices away from fundamentals then there should be a positive relation between the slope component and returns. On the other hand, if the residual component captures transient institutional demand, then there should be a negative relation between the residual component and returns. To distinguish this detrended ownership from raw institutional ownership and other institutional ownership measures used in this paper, I refer to these components as abnormal institutional ownership throughout this paper.

After constructing abnormal institutional ownership, I assess whether there is a predictive relation between each abnormal institutional ownership component and short-term returns. There is a positive predictive relation between the level and slope components of abnormal institutional ownership. Consistent with the notion that unexpected institutional price pressure pushes prices away from fundamentals, I find a strong negative predictive relation between the residual component of abnormal institutional ownership and returns. These results are robust after

[4] Typically, the Hodrick-Prescott filter is used to remove the trend in economic output variables such as Gross Domestic Product and Gross National Product. (See Braun and Larrain (2005) and Hodrick and Prescott (1997)) Other scholars have used the Hodrick-Prescott filter to de-trend other financial variables. Naes et al. (2011) use the Hodrick-Prescott (1997) filter to de-trend market illiquidity measured using the Amihud (2002) illiquidity measure and Campello and Graham (2013) used the Hodrick-Prescott (1997) filter to de-trend accounting ratios such as the price-to-earnings ratio and the cash flow to assets ratio.

controlling for other institutional demand measures and other financial variables known to predict stock returns.

If the level and slope components of abnormal institutional ownership are persistent then this would suggest that an investor could earn a positive return by taking long positions in securities with a high level or slope component of abnormal institutional ownership. Moreover, if the residual component is transient then an investor should take long positions in securities with low residual abnormal institutional ownership and short positions in securities with high residual abnormal institutional ownership. Consistent with this intuition, I find that the high-low level and slope portfolios earns a positive and statistically significant Fama-French (1993) alphas, while the low-high residual abnormal institutional ownership portfolio earns a large positive and statistically significant alpha. Previously, Amihud (2002) suggests that illiquid firms should be more sensitive to large trades than large firms. The evidence from the abnormal institutional ownership is consistent with this. The high-low level and slope portfolios, as well as the low-high residual abnormal institutional ownership portfolios earn the largest returns within small firms and illiquid firms.

The evidence indicates that the returns to the slope abnormal institutional ownership strategies are likely due to institutional price pressure. Around the 3 years surrounding the formation date of the high and low slope portfolios, institutional ownership is generally increasing across time with the high slope portfolio and decreasing with the low slope portfolio. This results in a large imbalance in institutional trades, reaching a cumulative level close to +$800 million 3 years following the formation date. Similarly, the high slope portfolio consistently outperforms the low slope portfolio. A $1 investment 3 years prior to formation would result in a cumulative return of 70% 3 years following the sorting date on the slope component. These results indicate that the trend in institutional ownership is persistent across time.

Consistent with the conjecture that deviations from the trend in ownership is transient, there is a large mean reversion in both ownership and returns for portfolios formed on residual abnormal institutional ownership. Securities in the high abnormal institutional ownership portfolio experience a large run-up in both residual abnormal institutional ownership and raw institutional ownership prior to the portfolio formation date, and a correspondingly large decline in residual abnormal institutional ownership and raw institutional ownership after the portfolio formation date. The opposite result is found for securities in the low abnormal institutional ownership portfolio. Instead, these securities experience a large decline in residual abnormal institutional ownership and raw institutional ownership prior to portfolio formation, followed by a quick increase in residual abnormal institutional ownership and raw institutional ownership after the portfolio formation date. A similar result is found with the returns of the low-high abnormal institutional ownership portfolio. This portfolio experiences negative returns prior to portfolio formation and positive returns after portfolio formation. Thus, while ownership is deviating from its trend, the trades of financial institutions push prices away from fundamentals and then as ownership is reverting back the trades of financial institutions push prices back towards fundamentals.

I then proceed to check the robustness of these results using a variety of checks. I find similar results using the ownership of subgroups of financial institutions with the results found to be most similar using mutual fund ownership. I also check if these results are due to the use of the Hodrick-Prescott (1997) filter to detrend institutional ownership. I obtain very similar results if I detrend institutional ownership using a model with a constant term and linear time-trend term estimated using ordinary least squares. Finally, I define institutional trading momentum mathematically as the cumulative net trades of all financial institutions over the prior Q quarters scaled by the number of shares outstanding at the start of the period. There is a strong negative relation between institutional trading momentum and returns and the strategy that invests in low institutional trading momentum and shorts high institutional trading momentum securities earns a positive and statistically significant Fama and French (1993) alpha. Thus, the results presented in this paper are robust across different methodologies and definitions of institutional trading momentum.

Overall, I contribute to the extant literature by providing evidence that financial institutions push prices away from fundamentals. Unlike the previous studies in this area, I find that when ownership deviates from its trend there is a reversal in both returns and ownership in the short-term. The remainder of this paper is organized as follows: section I discusses our data and methodology, section II presents results indicating that financial institutions are pushing prices away from fundamentals, and section III concludes.

I. DATA AND METHODOLOGY

Data is obtained from a number of different sources. I obtain stock returns and other stock market data from the CRSP database and accounting data reported by firms from the COMPUSTAT database. Data necessary to construct institutional ownership and other related variables is obtained from the Thomson-Reuters Institutional Holdings (13F) database. Each quarter, financial institutions with more than $100 million in assets under management are required to report to the SEC their positions in equity securities as outlined in the Securities Exchange Act of 1934.[5] In this study I use institutional holdings data from March 1980 until December 2010. Institutional ownership is defined as the percentage of a firm's shares outstanding that are held by financial institutions and is calculated using shares outstanding from the CRSP database. Mutual fund holdings are obtained from the Thomson-Reuters mutual fund holdings database. Delisting returns are controlled for following the methodology used in Bulsiewicz (2013). In all of my future analysis I use only non-financial, non-utility firms with share price between $5 and $1,000, inclusive, as of the formation date.

Previously, Gompers and Metrick (2001) documented that institutional ownership has been increasing over time. I am able to confirm this result in the sample period (1980-2010). From March 1980 until December 2010, the average equally-weighted institutional ownership increased from 12.7% to 55.7%, while the average value-weighted institutional ownership increased from 33.6% to 71.3%. The results for equally-weighted portfolios are reported in Figure 1.[6] The two institutional ownership time series are constructed using all common shares (share codes equal to 10 or 11) that are traded in the United States.

I also calculate bank ownership, insurance ownership, mutual fund ownership, and other financial institutions ownership. I calculate mutual fund ownership by aggregating across all mutual funds in the Thomson Reuters mutual fund database. Bank ownership, insurance ownership, and other financial institutions ownership is calculated using the methodology used in Lewellen (2011). I classify all firms in the Thomson Reuters institutional ownership database as a bank, insurance company, or all other institutions. I then aggregate the holdings of each

[5] More information on 13F institutional ownership filings is available at http://www.sec.gov/divisions/investment/13ffaq.htm .

[6] For brevity, some results are omitted if they are similar to results already shown in a table or figure.

institution type. Other financial institutions ownership is calculated by subtracting mutual fund ownership (from the mutual fund database) from the all other financial institutions ownership. Other financial institution ownership includes the holdings of hedge funds and pension funds. The time series of bank, insurance, and other ownership is plotted in Figure 1. From this figure we can see the trend in institutional ownership is due to a large increase in mutual fund and other financial institutions' ownership. The ownership of banks and insurance companies has been fairly flat over time.

In this paper, I explicitly control for institutional trading momentum. Specifically, for each security in the market I decompose institutional ownership into a level, slope, and residual component using the Hodrick-Prescott (1997) filter with λ equal to 1600. The Hodrick Prescott (1997) filter minimizes the following equation:

$$\sum_{t=1}^{T}(Inst_t - \tau_t)^2 + \lambda \sum_{t=2}^{T-1}[(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 , \tag{1}$$

where INST is institutional ownership and τ is the trend component (level+slope) of institutional ownership. Thus, for each stock the residual component measures how far the current level of institutional ownership has deviated from its trend. As a robustness check on the selection of the Hodrick-Prescott (1997) filter, I also use institutional ownership detrended by a constant and linear time-trend term. Specifically, for each security I estimate the following equation:

$$Inst_t = \alpha + \beta t + \varepsilon_t \quad , \tag{2}$$

where INST is institutional ownership and *t* is the quarter number. I define the fitted value from Equation 2 as expected institutional ownership, and the residual value as residual institutional ownership.[7]

Additionally, I calculate abnormal ownership for the four subgroups of financial institutions using bank ownership, insurance ownership, mutual fund ownership, and other ownership. I define abnormal ownership using these four series as abnormal bank ownership, abnormal insurance ownership, abnormal mutual fund ownership, and abnormal other ownership.

[7] In this paper, I commonly abbreviate abnormal institutional ownership, expected institutional ownership and residual institutional ownership as AIO, E[IO], and RIO, respectively.

Similarly, I calculate expected and residual ownership for these four subgroups of financial institutions as well.

Figure 2 plots the time-series of abnormal institutional ownership for the whole market by equally weighting each security. Similar to the general increase in institutional ownership over time, the level component of abnormal institutional ownership has been increasing over time as well. The evidence presented in Panel B shows that there are cycles in the slope of abnormal institutional ownership. The lowest point was obtained during the Financial Crisis in 2009 and the highest point in 2004. Panel B also plots the results for abnormal ownership constructed using the ownership of subgroups of financial institutions. The results for subgroups of institutions are similar to the results found using abnormal institutional ownership.

Looking at figure 3, there appears to be cycles in abnormal institutional ownership, i.e. there are periods where institutional ownership is increasing and periods where institutional ownership is decreasing. Interestingly, prior to the financial crisis there was a large increase in abnormal institutional ownership and subsequently there was a large decrease in abnormal institutional ownership. I find similar results using value-weighted abnormal institutional ownership, except, I also find a large spike in abnormal institutional ownership during the Tech Bubble and 2001 recession. The results for abnormal bank, insurance, mutual fund, and other ownerships are similar to those found using abnormal institutional ownership, and are omitted for brevity.

II. RESULTS

After calculating abnormal institutional ownership, the first order of business is to determine the relation between abnormal institutional ownership and other institutional ownership measures. For each security, I calculate a total of 15 institutional ownership measures: level, slope, and residual abnormal institutional ownership, change in level, slope, and residual abnormal institutional ownership, change in expected institutional ownership, change in institutional ownership, change in residual institutional ownership expected institutional ownership, institutional ownership, institutional persistence, mutual fund herding, and residual institutional ownership. The change measures are calculated as the quarterly difference in their respective variables. Mutual fund herding is calculated using the Lakonishok et al. (1992) measure following the methodology of Wermers (1999). The Lakonishok et al. (1992) measure is defined as $HM_{i,t}= |p_{i,t} - E[p_{i,t}]| - AF_{i,t}$ where $p_{i,t}$ is the proportion of buying and selling mutual funds that increase their holdings of stock i in quarter t. and $AF_{i,t}$ is an adjustment factor which takes into account that the expected value of $|p_{i,t} - E[p_{i,t}]|$ is greater than zero under the null of no herding. The adjustment factor is defined as $AF(i) = E|p_{i,t} - E[p_{i,t}]|$. Following Dasgupta et al. (2011) I define institutional persistence as the number of quarters that institutional ownership was bought over the most recent 3 quarters, inclusive of the current quarter. Nagel residual institutional ownership is as defined in Nagel (2005), who defines residual institutional ownership as the residual from the regression equation:

$$logit(INST) = \alpha + \beta_1 LOGSZ_{i,t} + \beta_2 (LOGSZ_{i,t})^2 + e_{i,t} \ , \tag{1}$$

where INST is institutional ownership, logit(INST) = $\log(\frac{INST}{1-INST})$, $LOGSZ_{i,t}$ is the log of firm size, and $(LOGSZ_{i,t})^2$ is the log of firm size squared. Nagel uses residual institutional ownership to control for institutional ownership that is related to firm size. To test the robustness of the use of abnormal institutional ownership, I also calculate residual institutional ownership. Residual institutional ownership is defined as the residual from the regression of firm-level institutional ownership on a constant and a time trend term.[8]

As argued in Dasgupta et al. (2011), I standardize each of the nine institutional ownership variables by the quarterly cross-sectional mean and standard deviation in order to be able to interpret the coefficients from any future regressions. Prior to running any regressions, I calculate the correlations between these 15 measures. These correlations are reported in Table I. There is a small correlation between each component of abnormal institutional ownership. The first difference in the level component of abnormal institutional ownership is not surprisingly highly correlated with the slope component since by definition the slope component is the one quarter change in the level component. Also, as expected the level component is highly correlated with institutional ownership. Each of the components of abnormal institutional ownership is only

[8] In this paper, I will refer to the residual ownership from Nagel (2005) as Nagel (2005) residual ownership, Nagel ownership, or more simply Nagel RIO in order to differentiate it from residual ownership calculated using a linear trend as defined in Equation 2.

moderately correlated with the other institutional ownership measures used in prior studies. Of these measures, abnormal institutional ownership has the highest correlation with the one quarter change in institutional ownership and is negatively correlated with mutual fund herding. The residual component of abnormal institutional ownership is moderately correlated with the one quarter change in abnormal institutional ownership and highly correlated with residual institutional ownership. The correlation between abnormal institutional ownership and residual institutional ownership is 82%.

Table II presents the correlation matrix between each component of abnormal institutional ownership and the four other abnormal ownership measures. First looking at the correlations for the level component variables, abnormal institutional ownership has a very high correlation with the level components constructed using mutual fund holdings and the holdings of other financial institutions. A fairly similar result is found looking at the correlations between slope variables or residual variables. In addition, the correlations between the abnormal ownership of each subgroup is low.

A. Fama MacBeth Tests

While abnormal institutional ownership is related to the other measures of institutional ownership, it is not yet clear if it contains additional information not captured by other institutional ownership variables. To test whether abnormal institutional ownership contains information not contained in the other measures, I run Fama-MacBeth (1973) regressions of future 1 year buy and hold returns on each of the abnormal institutional ownership and other institutional demand measures. I regress the buy and hold return from July of year t until June of year t+1 on each of these measures in June of year t. The coefficient estimates for each of the variables are presented in Table III. Panel A of Table III shows the results for the new institutional demand measures, while Panel B shows the results for the institutional demand measures previously used in the literature. The table presents the results for all firms and for small, medium, and large market capitalization firms. Size groups are defined using NYSE 30^{th} and 70^{th} percentile breakpoints. This definition of firm size was previously used in Cooper et al. (2008).

The results reported in Table III indicate that there is a positive and significant relation between the level of abnormal institutional ownership and short-term returns. This result is consistent with Gompers and Metrick (2001), who find a positive relation between the level of institutional ownership and short-term returns. This result is robust across size groups and is strongest within small firms. Similarly, there is a strong positive relation between expected institutional ownership and returns.

If the trades of financial institutions push prices away from fundamentals and the slope component of abnormal institutional ownership is persistent then there should be a positive relation between the slope component and short-term returns. On the other hand, if the residual component is transient and financial institutions push prices away from fundamentals, then there should be a negative relation between residual AIO and short-term returns. This is exactly what I find. There is a strong positive relation between the slope component of abnormal institutional ownership and returns and a strong negative relation between the residual component of abnormal institutional ownership and returns. A one standard deviation increase in the slope component results in an increase in annual returns by 9.72% (*t*-statistic = 8.25), while a similar change in the residual component results in a decrease of 9.58% (*t*-statistic 6.03). Looking at Panels A.2 to A.4, the result for the residual component is statistically significant across small, medium, and large firms, and the result for the slope component is statistically significant for all of the size groups except for large firms. Furthermore, the result for the residual component is robust using residual institutional ownership constructed using a constant and linear time-trend term. There is a statistically negative relation between residual institutional ownership and short-term returns.

Similar to the results found using the level component the relation between the slope and residual components and returns decreases in strength moving from small firms to large firms. These results are consistent with Amihud (2002), who suggests that the securities of small firms are more illiquid and more sensitive to large trades. If small firms are more sensitive to institutional demand than large firms then this would explain why there is a stronger relation between abnormal institutional ownership and short-term returns.

On the other hand, consistent with the prior literature, I find an insignificant relation between short-term returns and change in institutional ownership, institutional ownership, mutual fund herding, or persistence. Furthermore, I find a positive relation between Nagel (2005) residual institutional ownership and short-term returns. I also find that abnormal institutional ownership produces a much higher average adjusted r-squared than any of the other measures. These results indicate that abnormal institutional ownership contains new information not present in the other measures.

Given that the components of abnormal institutional ownership have a fairly high correlation with the change in the components of abnormal institutional ownership but has a larger effect on future returns than these other variables, I do not include these other variables in future Fama-MacBeth (1973) tests. I also exclude institutional ownership as an explanatory variable since it is highly correlated with Nagel (2005) residual institutional ownership. While the previous results showed that abnormal institutional ownership contains information not contained in other institutional demand variables, abnormal institutional ownership could be capturing information in other financial variables. I consider a total of 14 other financial variables: accruals, asset growth, book-to-market ratio, Daniel and Titman Composite issuances, firm size, gross profitability, idiosyncratic risk, investments-to-assets, momentum, net stock issuances, O-score, return on assets return on equity, and share turnover. A more detailed description of these variables is given in the Appendix.

Prior to running any Fama-MacBeth (1973) regressions, I calculate the correlation between abnormal institutional ownership and the fourteen other financial variables. Each variable is standardized by its quarterly cross-sectional mean and standard deviation. I exclude firms with low prices (less than \$5), high prices (greater than \$1,000), financial firms (SIC codes between 6000 and 6999), and utilities (SIC codes between 4900 and 4999). These correlations are given in Table IV. The results reported in Table IV indicate that the three components of abnormal institutional ownership are not highly correlated with other financial variables.

I perform Fama MacBeth (1973) regressions of annual July of year t until June of year t+1 returns on the three components of abnormal institutional ownership and other financial variables in June of year t. The average coefficient estimates and their corresponding t-statistics are reported in Table V, with Panel A reporting the results for abnormal institutional ownership and Panel B reporting the results for expected institutional ownership and residual institutional ownership. I first estimate the relation between future returns and the three components of abnormal institutional ownership. From this regression, each of the components of abnormal institutional ownership is highly significant with *t*-statistics ranging from 3.66 to 8.68. There is a strong positive relation between the slope and level components of AIO and returns and a strong negative relation between the residual component of AIO and returns. In regression specification 2, I add the three institutional demand variables: mutual fund herding, Nagel (2005) residual institutional ownership, and persistence. Even after adding these variables there is still a strong relation between abnormal institutional ownership and short-term returns. Further, the mutual fund herding coefficient is not statistically different from zero and there is a positive relation between Nagel residual institutional ownership and returns. Next, I add Daniel and Titman (2006) composite issuances and return on assets as control variables. Again, there is a strong relation between abnormal institutional ownership and short-term returns. In regression specification four I add gross profitability and share turnover, and in specification five I include all 17 control variables. Consistent with the other three specifications, the relation between abnormal institutional ownership and short-term returns is relatively unchanged after including all of these control variables.

I repeat these 5 specifications for small, medium, and large firms. Small firms have a much stronger relation between returns and the components of abnormal institutional ownership than the other two size groups. Thus, as firm size increases the effect of abnormal institutional ownership on returns decreases. This is consistent with the univariate regression results presented in Table III. Furthermore, unlike the general result reported in the literature, these results suggest that financial institutions push prices away from rather than towards fundamentals.

B. Fama MacBeth tests by institution subgroup

In this section I investigate whether the results presented in the last section can be extended to subgroups of financial institutions. I run the five Fama-MacBeth (1973) regressions using abnormal bank, insurance, mutual fund, and other ownership. The estimated Fama-MacBeth coefficients are reported in Table VI, with Panels A, B, C, and D presenting the results using abnormal bank, insurance, mutual fund, and other ownership. For all four types of institutions there is a significant positive relation between the slope component of abnormal ownership and short-term returns and a negative relation between the residual component and short-term returns. Further, across all four institution types, there is typically a positive relation between the level component and returns. Out of the four types of institutions, the largest coefficients are found using abnormal mutual fund ownership and the weakest results are found using abnormal insurance ownership. Thus, all four institutions seem to exert an effect on returns, with banks and insurance companies exerting the least and mutual funds, hedge funds, and other institutions exerting the most.

C. Abnormal institutional ownership portfolio tests

To further examine the relation between institutional demand and returns, in June of each year from 1980 until 2010, I allocate firms into ten decile portfolios on one of the three components of abnormal institutional ownership using New York Stock Exchange (NYSE) breakpoints. I then calculate the average characteristics across all years for each of the ten portfolios. I report these descriptive statistics in Table VII. The results for the level component of abnormal institutional ownership are presented in Panel A of Table VII. Perhaps unsurprisingly, as the level of abnormal institutional ownership increases, expected institutional ownership, institutional ownership, and Nagel residual institutional ownership increases. Further, firms with low levels of abnormal institutional ownership have are small firms while firms with high levels of abnormal institutional ownership are large firms. This evidence is consistent with Gompers and Metrick (2001), who find that institutions hold larger positions in liquid stocks of large firms.

Table VII shows the results for the slope portfolios in Panel B. The average slope of securities in the high slope component portfolios is 2% per quarter, while the average slope of securities in the low portfolios is close to -1% per quarter. The securities in the extreme deciles have small differences in firm size, idiosyncratic risk, illiquidity, and market beta. On the other hand, the securities in the high slope portfolio have experienced larger price momentum and have higher Daniel and Titman (2006) composite issuances and return on equity than the securities in the low slope portfolio.

The characteristics of securities in the 10 residual abnormal institutional ownership portfolios are presented in Panel C of Table VII. There is a large difference of close to 20% of shares outstanding in residual AIO between the two extreme portfolios. This difference is reflected in the values of the level of abnormal institutional ownership and institutional ownership. The current value of institutional ownership for the low level decile portfolio is below the “expected” value of the institutional ownership given by the level component of abnormal institutional ownership, thus residual AIO is negative for this portfolio. Similarly, residual AIO is positive for the high residual AIO portfolio since the current institutional ownership is above the “expected” value given by the level component of abnormal institutional ownership. Therefore, in both cases institutional ownership has deviated by about 10 percentage points from its “expected” level. Further, both portfolios have level components of abnormal institutional ownership that are of similar, 46% for the low portfolio and 50% for the high portfolio.

Interestingly, firms with low abnormal institutional ownership have not been persistently sold. The Dasgupta et al. (2011) persistence measure takes a value of -3 if a stock has been sold over the prior 3 quarters, but here I am finding the average persistence for portfolio 1 is -0.07, which is close to zero. This implies that firms with low abnormal institutional ownership have been neither persistently bought nor sold, which suggests that financial institutions sell a large portion of their holdings in one quarter rather than selling small portions of their holdings over multiple quarters. Alternatively, the high portfolio has on average been purchased over the prior 1.88 quarters, suggesting that the large deviation in the high portfolio is due to buying pressure over multiple periods.

C.1 Abnormal institutional ownership in event time

Next I investigate how abnormal institutional ownership changes prior to and after the allocation date. Figures 3, 4, and 5 plot the average level, slope, and residual abnormal institutional ownership, respectively, for the low and high abnormal institutional ownership portfolios constructed for each component. The results presented in Figure 3 show that for the high and low level portfolios the average levels of AIO are fairly stable for the 12 quarters surrounding the formation date. The high level portfolio has a positive slope 12 quarters prior to formation but this decreases over time and becomes negative 12 quarters after formation, while the low level portfolio has a smaller positive slope that increases marginally from 12 quarters before to 12 quarters after formation. Additionally, as shown in Figure 5, the securities in the high and low level portfolios have residual abnormal institutional ownership that is relatively stable over time.

If the slope component is persistent than the level of abnormal institutional ownership should be increasing over time and the slope component should be stable over time. This is precisely what I find. Panel B of Figure 3 shows that for the high slope portfolio, the level component of abnormal institutional ownership increases over time from close to 27% to 62%, while the level component of abnormal institutional ownership for the low portfolio decreases from close to 56% to 32% over the 24 quarters surrounding the formation date. Further, the slope component for the high portfolio remains positive and is slightly concave, while the slope component for the low portfolio is mainly negative and convex across time. The evidence indicates that the residual abnormal institutional ownership is increasing over time within the high portfolio and decreasing over time in the low portfolio.

The hypothesis for the extreme residual AIO portfolios is that residual institutional ownership is transient, therefore, there should be a large fluctuation in the slope component of AIO and a large reversion in residual AIO. Figures 4 and 5 show that these predictions are realized. In Figure 4, Panel C, the slope component of the high residual AIO portfolio is close to 1.2% per quarter 12 quarters prior to formation, then decreases rapidly and levels off around zero 9 quarters after the formation date. The slope component of the low residual AIO portfolio increases 6 quarters prior to formation and then reverses 3 quarters after formation date and continues decreasing afterwards. Panel C of Figure 5 shows that both extreme residual AIO portfolios experience a large spike in residual AIO which reverses rapidly after the formation date. Thus, this evidence is consistent with deviations from the trends in institutional ownership creating large institutional price pressure.

C.3 Institutional ownership in event time

To provide further insight on the prior results, I also calculate the mean amount of institutional ownership for the ten abnormal institutional portfolios for the 12 quarters surrounding the allocation date. The time-series of average institutional ownership for the low and high abnormal institutional ownership portfolios are plotted in Figure 6, while Figure 7 shows the mean difference in institutional ownership in event time for the Low-High abnormal institutional ownership portfolios. Consistent with the results presented in the prior section, Figure 6 shows that the level of institutional ownership is relatively stable within the level component portfolios, increasing within the high slope component portfolio, decreasing within the low slope component portfolio, and mean-reverting within the high and low residual component portfolios. Figure 7 shows that the difference in institutional ownership between the low and high level portfolios widens slightly prior to formation and then decreases following formation. Panel B of Figure 7 shows that 12 quarters prior to formation institutional ownership is 30 percentage points higher within the low slope portfolio than within the high slope portfolio, by 12 quarters after formation this margin has reversed and institutional ownership is more than 30 percentage points lower within the low slope portfolio than within the high slope portfolio. Finally, Panel C shows that 12 months prior to formation, the low residual portfolio has institutional ownership that is around 10 percentage points higher than the high residual portfolio, then there is a large decline up to the formation date and this difference decreases by 35 percentage points and there is then a reversal after formation and the difference reverts back to being around 10 percentage points higher. These results provide further confirmation that the trend component is persistent while the residual component is transient.

C.5 Returns to abnormal institutional ownership strategy in event time

In this section, I investigate the returns to the abnormal institutional ownership strategies for the 36 months surrounding the formation date. While there may not be clear predictions for the level component of abnormal institutional ownership, there are two predictions for the slope and residual components. If the trades of financial institutions push prices away from fundamentals, then since the slope component is persistent, the high slope component portfolio should consistently outperform the low slope component portfolio. Further since residual abnormal institutional ownership is transient there should be a reversal in returns when the residual component reverts back towards its trend. After forming the abnormal institutional ownership portfolios in June, for each portfolio I calculate the cross-sectional average return for the 36 months surrounding the allocation month. I also calculate the returns to strategies that sort stocks on each of the abnormal ownership subgroups. Figure 8 plots the cumulative average monthly return surrounding the formation month for the strategy that buys low abnormal institutional ownership firms and sells high abnormal institutional ownership firms as well as the cumulative returns for Low-High portfolios formed using abnormal bank, insurance, mutual fund, and other ownership.

The cumulative return for the Low-High level portfolios are presented in Panel A of Figure 8. This figure shows that in the 36 months leading up to formation, the securities in the high portfolio underperform those in the low portfolio. Then, following formation this pattern reverses and the securities in the high portfolio outperform those in the low portfolio. If this result was due to institutional price pressure then we would expect institutional ownership to be decrease more rapidly in the high portfolio than the low portfolio prior to formation and then reverse following formation. However, this result is likely not due to institutions pushing prices away from fundamentals since in the 36 months prior to formation institutional ownership increases more rapidly within the high level portfolio than the low portfolio and in the 36 months following formation institutional ownership goes up in the low portfolio but down in the high portfolio, which is the opposite of what is expected.

The results for the slope and residual portfolios are consistent with the aggregate trades of financial institutions pushing prices away from fundamentals. For the slope portfolio, we see that the returns to this strategy are almost always decreasing. Over the 72 months, the cumulative return is close to -75%. This pattern is found using the trades of all institutions or the trades of subgroups of institutions. Interestingly, even though mutual funds only have at most 23% of the holdings of equity securities on average, the cumulative returns for the slope strategy constructed using their trades is almost the same magnitude as the strategy using the trades of all institutions.

Consistent with the hypothesis that financial institutions push prices away from fundamentals, there is a large reversal in returns for the strategy that trades on residual abnormal institutional ownership. Prior to formation, this strategy loses more than 30% of its value, but then around the time of formation there is a reversal, and by the 13th month after formation, this strategy has a cumulative return that is close to zero. Thus, there is mean-reversion in both ownership and returns following a large deviation in institutional ownership. A similar pattern is found looking at the trades of each subgroup of financial institutions.

In Figure 9, I present how the value of $1 would change if it were invested in the abnormal institutional ownership strategies 36 months prior to formation and then held in these portfolios until 36 months after the formation date. From Panel A of Figure 9, we see that the returns of the two level portfolios generally follow the same trend, although, there are some instances where the low portfolio outperforms the high portfolio, and other instances where the high portfolio outperforms the low portfolio.

Similar to the results shown in Figure 8, the high slope portfolio consistently outperforms the low slope portfolio. The $1 invested in the high portfolio would have grown over the 6 years to approximately $6.31 while the $1 invested in the low portfolio would have grown to only $1.65. This is consistent with financial institutions pushing the prices of the high portfolio above fundamentals and conversely keeping the prices of the low portfolio down.

Panel C of Figure 7 shows how $1 invested at the end of the 37th month prior to the sort date would change if it were invested in the low and high residual abnormal institutional ownership portfolios. From this figure, it appears that financial institutions push prices away from fundamentals. Up to 27 months before the sort date, the value of $1 would have grown to about the same amount in both the low and high portfolios. However, after this date the high abnormal institutional ownership outperforms the low abnormal institutional ownership portfolio by an ever increasing margin up until around the sorting date.

At the peak, the one dollar invested in the high portfolio would be worth almost 89 cents more than the one dollar invested in the low abnormal institutional ownership portfolio. However, around the sorting date, this all changes since the value of $1 in the high portfolio converges back towards the value of the $1 invested in the low portfolio, and around the 15th month after the sorting date these two portfolios would have almost the same value. Past this date, the $1 invested in the low abnormal institutional ownership portfolio is always greater than the $1 invested in the high abnormal institutional ownership portfolio. Thus, these results indicate that financial institutions push prices away from fundamentals and then eventually they push them back towards fundamentals.

C.6 Order imbalance in event time

Next, I investigate whether the trades of financial institutions create large order imbalances between buys and sells. If the previous results are due to institutional price pressure then there should be a large order imbalance between the low and high portfolios. I define order imbalance as the net dollar change in ownership for each stock in the market. Dollar change in ownership is estimated using the average price prevailing over the reporting period. I calculate each stock's institutional order imbalance for all institutions and for banks, insurance companies, mutual funds, and other institutions. Then for the low and high abnormal institutional ownership portfolios I calculate the average order imbalance for the 12 quarters surrounding the formation date. The cumulative order imbalance for all institutions and for each of the four institution types are presented in Figure 10.

The results for the level portfolios indicate that there is a large negative order imbalance, between the low and high portfolios. This indicates that financial institutions buy the securities in the high portfolio more in net than they buy the securities in the low portfolio. Over the 24 quarters the cumulative order imbalance is close to -\$300 million. As the order imbalance increases over time, there are “bounces” that occur. Based on the results presented in the figure, this phenomenon is driven by other financial institutions.

Consistent with the returns to the slope and residual strategies being driven by institutional price pressure, we can see in Panels B and C that the cumulative order imbalance for these two strategies have the same patterns as the patterns found when looking at the cumulative returns. Overall, the cumulative order imbalance of the slope strategy reaches close to -\$800, while the cumulative order imbalance of the residual strategy reaches close to -\$300 before reversing and turning positive around the 5th quarter of formation. These results are again consistent with the aggregate trades of financial institutions pushing prices away from fundamentals. As a further robustness check, I show in Figure 11 that similar patterns are found looking strategies that trade on abnormal mutual fund ownership. However, unlike the results found for abnormal institutional ownership, which appear to be driven by the collective trades of all institutions, the results for abnormal mutual fund ownership appear to be almost exclusively driven by only the trades of mutual funds.

C.7 Book-to-market ratio

So far, all of the results point towards financial institutions pushing prices away from fundamentals. To further investigate whether the results are due to institutional driven price pressure, I investigate how the average book-to-market ratio of the high and low abnormal institutional ownership portfolios evolves over the 36 surrounding the allocation date. If prices are changing due to changes in fundamentals then the book-to-market of the extreme portfolios should remain relatively constant. However, if institutions are driving prices away from fundamentals then there should be large changes in book-to-market ratios. For the slope portfolios, the book-to-market ratio of the high portfolio should move downward, while the book-to-market ratio of the low portfolio should move downward. For the high residual abnormal institutional portfolio we should see a large decline in the average book-to-market ratio prior to the allocation date and a large increase in the average book-to-market ratio following the allocation date. The opposite result should occur for the low residual abnormal institutional ownership portfolio, there should be a large increase in the average book-to-market ratio prior to the allocation date and a large decline in the average book-to-market ratio following the allocation date. In Figure 12, I plot the average book-to-market ratio for the high and low abnormal institutional ownership portfolios.

First, looking at the results for the level portfolios presented in Panel A, the book-to-market ratios of the two portfolios varies across time, but there is not clear evidence that they are wildly diverging from one another. On the other hand, the results presented in Panels B indicate that there is large changes in the book-to-market ratios of the slope portfolios. Consistent with prices being pushed away from fundamentals, the average book-to-market ratios of the two portfolios are initially fairly close to one another. However, over time they diverge with the low portfolio increasing from 0.77 to 1.36, while the high portfolio decreases from 0.72 to 0.55. This is consistent with the two opposing trends in institutional trades pushing the prices of one portfolio upwards and the other portfolio downwards.

Consistent with the predictions for the residual institutional ownership strategy, I again find evidence that prices are pushed away from fundamentals. Initially, 36 months before the allocation date the high and low residual abnormal institutional ownership portfolios have similar book-to-market ratios. However, this quickly changes as the book-to-market ratio of the high abnormal institutional ownership portfolio declines from an initial value of 0.73 to a value of 0.52. Then following formation the book-to-market ratio of this portfolio more than doubles to a maximum value of 1.22, 32 months after formation. Thus there is substantial evidence that financial institutions push the price of the high residual abnormal institutional ownership portfolio away from fundamentals. For the low abnormal institutional ownership portfolio, there is much less evidence that the trades of financial institutions push prices away from fundamentals. Based on Figure 12, it looks like the book-to-market ratio of the low abnormal institutional ownership portfolio fluctuates without a clear upward or downward trend.

The prior book-to-market results are further confirmed when looking at the mean difference in book-to-market ratios for the low-high portfolios. As shown in Panels A, B, and C, the book-to-market ratio of the low-high level portfolio fluctuates some over time, the difference in the book-to-market ratio between the low and high slope portfolios grows over time, while the difference in the book-to-market ratio for the low and high residual portfolio increases initially and then rapidly decreases until month 19 and then increases slightly from 19 months after formation to 36 months after formation.

C.8 Average portfolio returns and Fama-French (1993) alphas

Next, I investigate how a strategy that purchased the low abnormal institutional ownership portfolios and sold the high abnormal institutional ownership portfolios would perform in the one year following the allocation date. After allocating each firm to an abnormal institutional ownership portfolio, following the methodology of Fama and French (2008), for each portfolio I calculate equally-weighted and value-weighted returns from July of year t until June of year t+1. Independent of the abnormal institutional ownership portfolio assignment, I also assign firms to one of three size portfolios and to one of three illiquidity portfolios using 30th and 70th percentile NYSE breakpoints. I calculate returns for the abnormal institutional ownership portfolios for all firms, for sub periods, and for size and illiquidity subgroups. Illiquidity is measured using the annual Amihud (2002) measure constructed using daily data. Additionally, as a robustness check, I calculate returns for abnormal ownership strategies constructed using abnormal bank ownership, abnormal insurance ownership, abnormal mutual fund ownership, and abnormal other ownership. The three sub periods are 1980-1989, 1990-1999, and 2000-2010. The unconditional average raw returns and the Fama and French (1993) alphas for each of the abnormal institutional ownership portfolios are presented in Table VIII and the results for subgroups and sub periods are presented in Table IX.

Consistent with the event time results presented earlier, there is a positive relation between short-term returns and the level and slope portfolios and a negative relation between returns and the residual portfolios. The high-low level and slope portfolios earn equally-weighted average monthly returns of 0.9% (t = 5.20) and 2.73% (t = 13.42), respectively, while the low-high residual portfolio earns an equally-weighted average monthly return of 2.75% (t = 13.22). The average returns to the value-weighted portfolios still exhibit the same relations except the returns are lower for the slope and residual portfolios. The high-low level and slope portfolios earn value-weighted average monthly returns of 0.89% (t = 3.79) and 1.05% (t = 5.60), respectively, while the low-high residual portfolio earns a value-weighted average monthly return of 1.17% (t = 6.16). These results are extremely robust after controlling for the Fama and French (1993) book-to-market, market, and size factors. The level, slope, and residual portfolios have equally-weighted monthly alphas of 0.78% (t = 5.42), 2.82% (t = 14.68), and 2.79% (t = 13.66), respectively, and value-weighted monthly alphas of 0.62% (t = 3.32), 1.00% (t = 6.44), and 1.21% (t = 6.60), respectively.

Overall, these results are consistent with the view that financial institutions push prices away from fundamentals. Since the slope component of institutional demand is persistent, there should be a positive relation between portfolios formed on the slope component and returns. Furthermore, the residual component is transient, so if the trades of financial institutions push prices away from fundamentals then there should be a negative relation between portfolios formed on the residual component and returns. These are exactly the results that were shown in Table VIII.

Previously, Amihud (2002) suggested that the returns to small firms should be more sensitive to large trades than the returns to large firms. The intuition for this suggestion is that small firms have fewer shares outstanding and are generally less liquid than similar large firms. Thus, trading in the securities of small firms should have more of a price impact than trading in those of large firms. In addition, since institutional ownership has been increasing over time, the effect of institutional trades on returns could be greater in the later part of the sample when institutions are a larger player in the stock market. The results presented in Table IX largely support these hypotheses. The returns to the level, slope, and residual strategies earn much larger returns among small firms and illiquid securities. Further, these results are not explained by the Fama and French (1993) risk factors.

Generally, the returns to the abnormal institutional ownership strategies are strongest during the period 1990-1999 and weakest in the period 1980-1989. This results is fairly consistent with the view that institutions exert more power over prices in the equity market as their ownership level increases. The last set of results presented in Table IX are the results for strategies constructed using abnormal bank, insurance, mutual fund, and other ownership. These results are presented in Panel D. Similar to the cumulative return results presented earlier, the results found using abnormal institutional ownership are again found using only the trades of subgroups of financial institutions. Further, the results again show that the returns to strategies constructed using the trades of mutual funds are of similar magnitude to those found using the trades of all institutions.

Overall, all of the evidence presented thus far indicates that the aggregate trades of financial institutions pushes prices away from fundamentals. In the next section I check the robustness of the prior results using a novel measure of institutional demand.

D. Institutional trading momentum results

The prior results document a strong relation between the components of abnormal institutional ownership and demand. However, there could be a concern that these results are due to using the entire sample to calculate abnormal institutional ownership. Further, another concern could be that the abnormal institutional ownership trading strategy is not implementable since it relies on information that is not available ex ante. In this section I address both of these concerns using a novel measure of institutional demand constructed using only information known ex ante. Previously, Cai and Zhang (2004) investigate the relation between stock returns and institutional trades using percentage of institutional trading. They define percentage institutional trading as the ratio of net institutional trades scaled by shares outstanding and net institutional trades as the total shares purchased less the total shares sold by financial institutions in a quarter. Additionally, the evidence previously reported shows that the cumulative net trades of financial institutions changes rapidly for portfolios with extreme values of abnormal institutional ownership. Furthermore, Dasgupta et al. (2011) present evidence that institutions can be buyers or sellers over multiple quarters. Motived by this prior literature and the previously reported results, I define institutional trading momentum as the cumulative net trades of financial institutions over the prior Q quarters scaled by shares outstanding at the start of the period, with net trades defined as the total shares bought less the total shares sold by financial institutions in a quarter. Both shares traded and shares outstanding are adjusted for stock splits using the CRSP stock-split adjustment factors. For all stocks in CRSP, I calculate institutional trading momentum for values of Q between 1 and 20 (between 1 and 20 quarters). When $Q = 1$, institutional trading momentum is defined the same as the Cai and Zhang percentage of institutional trading momentum measure.

D.1 Institutional trading momentum Fama MacBeth results

To test whether institutional trading momentum can predict stock returns, I estimate Fama-MacBeth (1973) regressions of annual returns on institutional trading momentum and six other financial variables. The six other financial variables are book-to-market ratio, firm size, institutional ownership, return momentum, mutual fund herding, and Dasgupta et al. (2011) institutional trade persistence. Regressions are estimated each June from 1980 until 2010 using common shares with a share price between \$5 and \$1,000. Financial firms and utilities are excluded from the regressions. The dependent variable in the Fama MacBeth regressions is the annual buy and hold return from July of year t until June of year t+1. To ensure that institutional trading momentum is known by the market, I wait three months after the 13F filing date before using the institutional trading momentum measure. All of the independent variables are standardized each month to have a mean of 0 and a standard deviation of 1. The estimated beta coefficients for institutional trading momentum are reported in Table XII for windows sizes ranging from $Q = 1$ to $Q = 20$. In Table XII, the estimates for all firms are presented in Panel A, while the results for small, medium, and large firms are reported in Panels B, C, and D, respectively. Firms are classified into size tertiles using 30^{th} and 70^{th} percentile NYSE breakpoints. From Table XII, Panel A we can see that there is a negative relation between institutional trading momentum and future returns. The estimated effect becomes large as we increase the number of quarters of net trades included in the institutional trading momentum measure. Specifically the relation is strongest using 10 quarters of data (2.5 years) and decreases in strength using values of Q greater than 10. The negative relation is robust and highly significant across all values of Q. Looking at the results reported in Panels B, C, and D, we can see that the relation is strongest for small firms and appears to weaken moving from small firms to large firms. Thus, even using a measure of institutional demand that relies only on publicly available information, there is still a strong negative relation between institutional demand and returns.

D.2 Institutional trading momentum decile portfolio results

Next, I investigate whether an investor can profitably trade on institutional trading momentum. In June of each year from 1980 until 2010, securities are allocated to decile portfolios based on institutional trading momentum. These portfolios are held from July of year *t* until June of year *t*+1 and are rebalanced in June of each year. At the time of formation I use only common shares (share codes equal to 10 or 11) with a share price between $5 and $1,000, excluding financials and utilities. Table XIII shows the characteristics of securities in these portfolios. The reported statistics are the time series means of annual medians at the time of formation. For brevity Table XIII shows the characteristics for portfolios formed on institutional trading momentum calculated using 10 quarters of data. Fairly similar results are obtained using institutional trading momentum calculated using more or less data. In Table XIII, Panel A shows the values of six institutional trading variables and Panel B shows the values for 7 other financial variables. Based on Panel A, there is a wide dispersion in institutional trading momentum across the deciles. The portfolio with low institutional trading momentum has an average institutional trading momentum of -0.1381 while the high institutional trading momentum portfolio has an average institutional trading momentum of 0.4900. Additionally, institutional trading momentum seems to do a fairly adequate job proxying for abnormal institutional ownership. Before the difference in abnormal institutional ownership between extreme abnormal institutional ownership portfolios was -0.1953, but for extreme institutional trading momentum portfolios, this difference is only -.0947.

Table XIII also shows that the firms in the extreme institutional trading momentum portfolios have a statistically significant difference in institutional ownership, Nagel (2005) residual institutional ownership. Additionally, the low institutional trading momentum portfolio invests in high book-to-market firms with low Daniel and Titman (2006) composite issuances, while the high institutional trading momentum portfolio invests in low book-to-market firms with high composite issuances.

I also investigate how correlated the institutional trading momentum measures are with one another as well as with other financial variables. Table XIV presents these correlations. First turning to the results in Panel A, institutional trading momentum is positively correlated across different window sizes, and is most highly correlated with windows that are similar in size. From Panel B, we see that institutional trading momentum is positively correlated with abnormal institutional ownership, although this correlation is less than 30%. Overall, institutional trading momentum is not highly correlated with other institutional trading measures.

After allocating the securities to deciles based on institutional trading momentum, equally-weighted and value-weighted monthly returns are calculated for each decile portfolio. This procedure is repeated for institutional trading momentum calculated using window sizes ranging from 1 quarter to 20 quarters. The average monthly returns and Fama-French monthly alphas for these portfolios are presented in Table XV. From this table we can see that there is again a negative relation between this measure of institutional trading momentum and returns. The largest average return for the equally-weighted portfolios is found using 10 quarters of data. This strategy earns an average monthly return of 0.65% per month (8.08% annualized). Additionally, there is again a U-shaped relation between institutional trading momentum and returns. This is consistent with the prior results which showed a reversal in abnormal institutional ownership after approximately 2.5 years. A similar pattern is found using value-weighted portfolios. However, the institutional trading momentum strategy with Q = 12 earns the largest return, 0. 84% per month (10.56% annualized). In both Panels A.1 and A.2, the equally-weighted and value-weighted portfolios earn a statistically positive return when 6 quarters or more of data are used in calculating institutional trading momentum.

The negative relation between institutional trading momentum and returns is not explained by the Fama and French (1993) factors. Panel B of Table XV shows that the Low-High institutional trading momentum portfolios earn positive and significant Fama-French alphas. Further the alphas are of similar magnitude as the raw returns. This result supports the notion that financial institutions create mispricing in the stock market.

Next, I assess whether the institutional trading momentum strategy is more profitable within certain subgroups of firms and within certain sub periods. Table XVI shows the average returns for the low-high institutional trading momentum portfolios for size subgroups, illiquidity subgroups, and for sub periods. Firms are classified into size groups at the time of portfolio formation using 30^{th} and 70^{th} percentile NYSE breakpoints. The estimated average returns for the three size groups are presented in Panel A. Within each size group, there is a negative and statistically significant relation between institutional trading momentum and returns. This relation is strongest using 10 quarters of data. Furthermore, this relation does not diminish after controlling for the Fama and French (1993) factors.

Portfolio returns are also calculated for the three sub periods: 1980-1989, 1990-1999, and 2000-2010. The average returns for the low-high institutional trading momentum portfolios for the three decades are presented in Panel B. Trading on institutional trading momentum appears to have been most profitable in the 2000s, but a number of the strategies earn a positive and statistically significant return in the other sub periods.

The results for the three illiquidity subgroups are presented in Panel C. Securities are classified into illiquidity tertiles using the Amihud 12-month illiquidity measure and 30th and 70th NYSE breakpoints. Unlike the results for abnormal institutional ownership, which found that the negative relation was strongest for illiquid securities, using institutional trading momentum there is a negative relation between institutional trades and returns across all three illiquidity groups. Further, in some instances the spread portfolio earns a larger return in the most liquid securities than in the least liquid securities.

Overall, the results presented using institutional trading momentum confirm the results found using abnormal institutional ownership. Using either measure, there is a negative relation between institutional trades and returns.

E. Abnormal institutional ownership and other institutional demand measures

The prior results showed that there is a negative relation between institutional demand and returns. The question remains, why do not I find the same result using other institutional demand measures. First, I investigate how institutional ownership and abnormal institutional ownership changes in event time for a strategy that trades on the change in institutional ownership. Previously, Nofsinger and Sias (1999) used to changes in institutional ownership to proxy for institutional ownership and found a positive relation between this variable and stock returns. Each June I allocate firms to one of 10 change in institutional ownership portfolios using NYSE breakpoints. Then, for each portfolio I calculate the cross-sectional mean institutional ownership for the 12 quarters surrounding the allocation date. The time series of mean abnormal institutional ownership for the high and low change in institutional ownership portfolios are plotted in Figure 14. For the high change in institutional ownership portfolio prior to the formation date, abnormal institutional ownership trends downward then there is a large increase in abnormal institutional ownership followed by a gradual decline in abnormal institutional ownership. I find a similar but opposite result for the low change in institutional ownership portfolio. Prior to the allocation date abnormal institutional ownership increases, then decreases sharply, and proceeds to increase slowly after the allocation date. Unlike when I formed portfolios using abnormal institutional ownership, here I find slower reversion in abnormal institutional ownership.

Next, I investigate how the average institutional ownership changes relative to the allocation date for the change in institutional ownership portfolios. The time series of mean institutional ownership for the high and low change in institutional ownership portfolios are plotted in Figure 15. For the high change in institutional ownership portfolio, there is a gradual increase in institutional ownership prior to the allocation date, then right before the allocation date there is a large positive jump in institutional ownership, followed by relatively little change in institutional ownership. Looking at the low change in institutional ownership portfolio's time series, there is also a gradual increase in institutional ownership, followed by a large negative jump in institutional ownership, and then a gradual increase in institutional ownership after the allocation date. These results seem to indicate that the reason that there is not a reversal found for portfolios formed on the change in institutional ownership is because these stocks do not experience as large of a change in abnormal and raw institutional ownership as the stocks contained in the extreme abnormal institutional ownership portfolios.

Perhaps the most commonly used measure of institutional demand is the Lakonishok et al. (1992) herding measure. Each June, I allocate securities to one of 10 mutual fund herding portfolios, five buy herding portfolios and ten sell herding portfolios. I then calculate how abnormal institutional ownership changes around the 12 quarters surrounding the allocation date for the strongest buy and sell herd portfolios. Figures 16 and 17 plot the time series of abnormal institutional ownership and institutional ownership for the strongest buy and sell herd portfolios. Looking at Figure 16, we can see that for the sell herd, initially there is a gradual increase in abnormal institutional ownership, followed by a fairly large decline in abnormal institutional ownership at the allocation quarter, and then a somewhat gradual increase in abnormal ownership in the following 12 quarters. For the strongest buy herd portfolio there is a gradual decline in abnormal institutional ownership, followed by an increase, and then a gradual decline. Compared to strategies sorted directly on abnormal institutional ownership, for the mutual fund herding strategy, the quarter-to-quarter change in abnormal institutional ownership is much more gradual.

In Figure 17 we can see that for the buy herd portfolio, institutional ownership is fairly flat prior to the allocation quarter and then increases and continues on a gradual upward trend following the allocation quarter. For the sell herd portfolio there is an increase in institutional ownership from 0.45 to 0.50 prior to the allocation quarter, then a decline in ownership between quarters -2 and +1, and then a gradual increase over the following 11 quarters. Thus, it appears that this measure does not capture the same level of price pressure that is found using abnormal institutional ownership.

Another proxy for institutional demand used in the literature is the Dasgupta et al. (2011) persistence measure. Each June I form five persistence portfolios, one portfolio for each of the values of persistence (persistence only takes the integer values of -3, -2, 0, 2, 3). I then calculate the cross-sectional average institutional ownership and abnormal institutional ownership. Figure 18 plots the average abnormal institutional ownership for the low and high persistence portfolios. From this figure we can see that after the large change in abnormal institutional ownership prior to the allocation date, there is a gradual reversion in abnormal institutional ownership afterwards. Whereas the extreme abnormal institutional ownership portfolios had a swift reversion in abnormal institutional ownership, the extreme persistence portfolios have a much slower reversion in abnormal institutional ownership.

The time series of mean institutional ownership for the low and high persistence portfolios is plotted in Figure 19. For both extreme persistence portfolios there is only a small change in institutional ownership prior to the allocation date, then there is a large change in ownership around the allocation date, and then a gradual upward trend following the allocation date. This suggests that perhaps the reason that Dasgupta et al. (2011) find continuation in the short term because there is a continuation in institutional ownership in the short term for securities in these two portfolios.

III. CONCLUSION

After controlling for trends in institutional ownership I find strong evidence that financial institutions push prices away from fundamentals. First, I find that the level and slope components of abnormal institutional ownership are highly persistent while the residual component is transient. Consistent with the view that that the trades of financial institutions push prices away from fundamentals, I find a positive relation between the persistent components and short-term returns and a negative relation between the transient component and short-term returns. When residual abnormal institutional ownership is extremely high or low, I find that it quickly reverts towards zero. In conjunction with this finding, I also find that there is a reversal in returns and institutional trades. A strategy that purchases the low residual abnormal institutional ownership securities and sells high residual abnormal institutional ownership securities has large negative returns prior to formation and positive returns in the year following formation. Theoretically, we would expect that institutional demand would have the largest effect on small firms and illiquid firms. This is exactly what I find. I find that strongest relation between abnormal institutional ownership and returns is present within illiquid securities and securities of small firms. I then construct a trading strategy on institutional trading momentum and find that there is again a negative relation between institutional demand and returns. Overall, these results show that it is important to control for institutional trading momentum when investigating the relation between institutional demand and returns.

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APPENDIX

A.1 Variable Descriptions:

Accruals:

Sloan (1996) finds that firms with low accruals outperform firms with high accruals. Following Sloan (1996), I define accruals as: Accruals = (ΔCA – ΔCash) - (ΔCL – ΔSTD –ΔTP) – Dep, where ΔCA is the change in current assets, ΔCash is the change in cash and equivalents, ΔCL is the change in current liabilities, ΔSTD is the change in debt included in current liabilities, ΔTP is the change in income taxes payable, and Dep is the depreciation and amortization expense. I construct the accruals measure using annual COMPUSTAT data.

Asset Growth:

Cooper et al. (2008) found that firms with low asset growth outperform firms with high asset growth. Using the definition given in Cooper et al. (2008), asset growth is defined as the year over year change in total assets divided by lagged total assets.

Book-to-market ratio:

Book-to-market ratio is defined as book equity for fiscal year t-1 divided by market equity at the end of December of year t-1. Book equity is calculated as total assets minus total liabilities plus deferred taxes and investment tax credit minus preferred stock. Market equity is calculated as share price multiplied by common shares outstanding. I construct this measure following Fama and French (2008).

Daniel and Titman Composite:

Daniel and Titman (2006) find a negative relation between composite share issuances and stock returns. Following their definition of composite share issuances, I define composite share issuances as

$\iota(t-5,t) = \log\left(\frac{ME_t}{ME_{t-5}}\right) - r(t-5,t)$, where ME_t is the firm's market equity today, ME_{t-5} is the firm's market equity 5 years ago, and r(t-5,t) is this firm's 5 year log return.

Firm Size:

Firm size is defined as price times shares outstanding, as in Fama and French (2008).

Gross Profitability:

Gross profitability is defined as total revenue less cost of goods sold divided by total assets. This definition was used in Novy-Marx (2012).

Idiosyncratic risk:

I follow the methodology of Ang, Hodrick, Xing, and Zhang (2009) and calculate idiosyncratic risk as the standard deviation of the residuals from a monthly regression of daily excess returns on the Fama and French (1993) 3- factor model. Excess returns are calculated as the difference between firm returns and the risk-free rate, the one-month Treasury bill rate.

Investments-to-assets:

I use the definition of investments-to-assets given in Stambaugh et al. (2012). They define investments to assets as the annual change in gross property, plant and equipment plus the annual change in inventories scaled by the lagged book value of assets.

Momentum:

I define momentum as the compound return between months t-12 and t-2. Jegadeesh and Titman (1993, 2001) provided evidence that firms with positive returns in the past continue to have positive returns in the short-term and firms with negative returns in the past continue to have negative returns in the short-term.

Net stock issuances:

Net stock issuances is defined as the log ratio of split adjusted shares to lagged split adjusted shares following Fama and French (2008).

O-Score:

I use the definition of Ohlson's (1980) O-score that was used in Chen, Novy-Marx, and Zhang (2011). Ohlson's O-score measures the probability of bankruptcy and is calculated using a variety of accounting measures including: total assets, book value of debt, working capital, net income, etc.

Persistence:

Persistence is the institutional trade persistence measure from Dasgupta et al. (2011). This variable measures the number of (consecutive) quarters that a certain stock has been bought or sold by financial institutions. I construct this measure using three quarters of institutional holdings data.

Residual Institutional ownership:

Residual institutional ownership was previously used in Nagel (2005) to study short sales and stock returns. He defines residual institutional ownership as the residual ownership remaining after regressing logit institutional ownership on log firm size and squared log firm size. The goal of this measure is to capture the amount of institutional ownership that is unrelated to firm size. I construct residual institutional ownership following the methodology given in Nagel (2005)

Return on assets:

I calculate return on assets as income before extraordinary items divided by lagged total assets. Return on assets was previously used in Fama and French (2006) to study the relation between profitable firms and stock market returns.

Return on equity:

Return on equity is calculated as income before extraordinary items divided by lagged book equity. I calculate this variable following the definition given in Chen et al. (2011).

Share turnover:

Share turnover is calculated as the log of monthly share volume divided by common shares outstanding. This definition is similar to the definition used in Chordia et al. (2001).

Table I. Correlation between abnormal institutional ownership and other institutional ownership variables

This table shows the correlations between abnormal institutional ownership (AIO) and other institutional ownership variables. Abnormal institutional ownership is defined as the level, slope, and residual components of institutional ownership after detrending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Expected institutional ownership (E[IO]) is the fitted value from the regression of institutional ownership on a constant and a time trend term. Institutional ownership (IO) is defined as the total shares held by all financial institutions scaled by current shares outstanding. Mutual fund herding (MF herding) is the Lakonishok et al. (1992) herding measure as used in Wermers (1999). Mutual fund herding is defined as the buy herding measure if the stock is bought in net or as the sell herding measure if the stock is sold in net. Nagel residual institutional ownership (Nagel RIO) is as defined in Nagel (2005). Nagel calculates residual institutional ownership as the residual from the regression of logit institutional ownership on log firm size and squared log firm size. Persistence is the Dasgupta et al. (2011) institutional persistence measure which counts the number of consecutive quarters over the prior 3 quarters that financial institutions have bought or sold a security. Residual institutional ownership (RIO) is the residual from the regression of institutional ownership on a constant and a time trend term. The change variables are the quarterly change in their respective variables. All variables are standardized each quarter by their cross-sectional mean and standard deviation.

Panel A. Correlations between abnormal institutional ownership variables and other institutional trading variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) AIO (level)	1														
(2) AIO (slope)	0.0125	1													
(3) AIO (residual)	0.0455	-0.0585	1												
(4) E[IO]	0.9645	0.0451	-0.0025	1											
(5) Change AIO (level)	0.0448	0.9938	-0.0244	0.0591	1										
(6) Change AIO (slope)	-0.3039	0.0340	-0.4424	-0.1747	-0.0324	1									
(7) Change AIO (residual)	0.0122	0.0529	0.5184	0.0051	0.0591	-0.0949	1								
(8) Change E[IO]	0.0849	0.6778	-0.0181	0.0865	0.6814	0.0023	-0.0071	1							
(9) Change IO	0.0186	0.2219	0.4990	0.0155	0.2283	-0.0988	0.9837	0.1110	1						
(10) Change RIO	0.0101	0.1326	0.5057	0.0067	0.1390	-0.1006	0.9921	-0.0175	0.9902	1					
(11) IO	0.9485	-0.0048	0.3519	0.9003	0.0362	-0.4237	0.1776	0.0739	0.1781	0.1721	1				
(12) MF herding	-0.1471	0.0244	-0.0752	-0.1285	0.0147	0.0402	-0.0019	-0.0141	0.0008	0.0023	-0.1618	1			
(13) Nagel RIO	0.5201	-0.0222	0.3299	0.4720	0.0136	-0.3372	0.1815	0.0311	0.1788	0.1771	0.5937	-0.1036	1		
(14) Persistence	-0.0122	0.2686	0.2759	-0.0187	0.2769	-0.0951	0.2760	0.1310	0.3122	0.2988	0.0747	0.0287	0.0754	1	
(15) RIO	0.1705	-0.1032	0.8163	-0.0152	-0.0388	-0.6140	0.3908	-0.0061	0.3700	0.3741	0.4151	-0.0953	0.3681	0.2105	1

Table II. Correlations between abnormal ownership and residual ownership variables

This table presents the correlations between five abnormal ownership measures: Abnormal institutional ownership, bank ownership, insurance ownership, mutual fund ownership, and other ownership. I classify the ownership of each institution in Thomson Reuters as a bank, insurance company, or non-bank and non-insurance company following the methodology of Lewellen (2011). I then calculate other ownership as the total non-bank and non-insurance institutional ownership minus mutual fund ownership. Mutual fund ownership is calculated from the Thomson Reuters mutual fund holdings database. I then calculate abnormal ownership for each institution subgroup using the Hodrick and Prescott (1997) filter with λ equal to 1600.

Panel A. Abnormal ownership variables

Panel A.1. Level variables

	(1)	(2)	(3)	(4)	(5)
(1) Abnormal institutional ownership	1				
(2) Abnormal bank ownership	0.5343	1			
(3) Abnormal insurance ownership	0.4483	0.2454	1		
(4) Abnormal mutual fund ownership	0.8621	0.2639	0.2806	1	
(5) Abnormal other ownership	0.8946	0.2984	0.2631	0.6868	1

Panel A.2. Slope variables

	(1)	(2)	(3)	(4)	(5)
(1) Abnormal institutional ownership	1				
(2) Abnormal bank ownership	0.5196	1			
(3) Abnormal insurance ownership	0.3792	0.1183	1		
(4) Abnormal mutual fund ownership	0.6510	0.2347	0.1780	1	
(5) Abnormal other ownership	0.7539	0.1791	0.0907	0.2191	1

Panel A.3. Residual variables

	(1)	(2)	(3)	(4)	(5)
(1) Abnormal institutional ownership	1				
(2) Abnormal bank ownership	0.4333	1			
(3) Abnormal insurance ownership	0.3287	0.0626	1		
(4) Abnormal mutual fund ownership	0.4882	0.1344	0.1165	1	
(5) Abnormal other ownership	0.7277	0.0665	0.0301	0.0125	1

Panel B. Residual ownership variables

Panel B.1. Expected ownership variables

	(1)	(2)	(3)	(4)	(5)
(1) Expected institutional own.	1				
(2) Expected bank own.	0.5415	1			
(3) Expected insurance own.	0.4649	0.2698	1		
(4) Expected mutual fund own.	0.8760	0.2766	0.2980	1	
(5) Expected other own.	0.9072	0.3157	0.2962	0.7285	1

Panel B.2 Residual ownership variables

	(1)	(2)	(3)	(4)	(5)
(1) Residual institutional own.	1				
(2) Residual bank own.	0.4531	1			
(3) Residual insurance own.	0.3168	0.0577	1		
(4) Residual mutual fund own.	0.5478	0.1370	0.1224	1	
(5) Residual other own.	0.7137	0.0832	0.0059	0.0450	1

Table III. Fama-MacBeth regressions of annual stock returns on abnormal institutional ownership and other institutional ownership variables

The table reports Fama-MacBeth (1973) coefficient estimates from predictive regressions of annual returns on lagged abnormal institutional ownership and other institutional ownership variables. Returns are the annual return from July of year t until June of year t+1. The level, slope, and residual components of abnormal institutional ownership (AIO) are calculated by detrending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Expected institutional ownership (E[IO]) is the fitted value from the regression of institutional ownership on a constant and a time trend term. Institutional ownership is defined as the total shares held by all financial institutions scaled by current shares outstanding. Mutual fund herding (MF herding) is the Lakonishok et al. (1992) herding measure as used in Wermers (1999). Nagel residual institutional ownership (Nagel RIO) is as defined in Nagel (2005). Persistence is the Dasgupta et al. (2011) institutional persistence measure. Residual institutional ownership is the residual from the regression of institutional ownership on a constant and a time trend term. The change variables are the quarterly change in their respective variables. All variables are standardized by their cross-sectional mean and standard deviation. I exclude financials (SIC codes 6000-6999), utilities (SIC Codes 4900-4999), and stocks with price less than $5 or greater than $1,000. I only use common shares with share codes equal to 10 or 11. Reported t-statistics (in parentheses) are adjusted for autocorrelation using Newey-West (1987) standard errors.

Panel A. Abnormal institutional ownership and residual institutional ownership variables

Panel A.1. All firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.1438	0.1437	0.1440	0.1438	0.1440	0.1441	0.1441	0.1440	0.1441	0.1440
	(4.46)	(4.46)	(4.47)	(4.46)	(4.49)	(4.49)	(4.49)	(4.49)	(4.49)	(4.46)
AIO (level)	0.0380	.	.	.	.	.	.	.	.	.
	(3.45)	.	.	.	.	.	.	.	.	.
AIO (slope)	.	0.0972	.	.	.	.	.	.	.	.
	.	(8.25)	.	.	.	.	.	.	.	.
AIO (residual)	.	.	-0.0958	.	.	.	.	.	.	.
	.	.	(-6.03)	.	.	.	.	.	.	.
E[IO]	.	.	.	0.0496	.	.	.	.	.	.
	.	.	.	(4.59)	.	.	.	.	.	.
Change AIO (level)	.	.	.	.	0.0958	.	.	.	.	.
	.	.	.	.	(7.88)	.	.	.	.	.
Change AIO (slope)	.	.	.	.	.	0.0443	.	.	.	.
	.	.	.	.	.	(3.91)	.	.	.	.
Change AIO (residual)	.	.	.	.	.	.	-0.0154	.	.	.
	.	.	.	.	.	.	(-8.05)	.	.	.
Change E[IO]	.	.	.	.	.	.	.	0.0544	.	.
	.	.	.	.	.	.	.	(9.27)	.	.
Change RIO	.	.	.	.	.	.	.	.	-0.0052	.
	.	.	.	.	.	.	.	.	(-2.20)	.
RIO	.	.	.	.	.	.	.	.	.	-0.0897
	.	.	.	.	.	.	.	.	.	(-7.23)
Avg. adjrsq	0.0115	0.0312	0.0308	0.0152	0.0308	0.0123	0.0010	0.0108	0.0005	0.0264

Table III. - *Continued*

Panel A.2. Small firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.1977	0.1616	0.1441	0.2118	0.1628	0.1419	0.1538	0.1619	0.1543	0.1399
	(5.22)	(4.50)	(3.99)	(5.48)	(4.52)	(3.87)	(4.26)	(4.58)	(4.26)	(3.89)
AIO (level)	0.0785	.	.	.	.	.	.	.	.	.
	(4.69)	.	.	.	.	.	.	.	.	.
AIO (slope)	.	0.1529	.	.	.	.	.	.	.	.
	.	(7.04)	.	.	.	.	.	.	.	.
AIO (residual)	.	.	-0.1511	.	.	.	.	.	.	.
	.	.	(-4.97)	.	.	.	.	.	.	.
E[IO]	.	.	.	0.1047	.	.	.	.	.	.
	.	.	.	(6.00)	.	.	.	.	.	.
Change AIO (level)	.	.	.	.	0.1485	.	.	.	.	.
	.	.	.	.	(6.77)	.	.	.	.	.
Change AIO (slope)	.	.	.	.	.	0.0847	.	.	.	.
	.	.	.	.	.	(4.21)	.	.	.	.
Change AIO (residual)	.	.	.	.	.	.	-0.0260	.	.	.
	.	.	.	.	.	.	(-7.78)	.	.	.
Change E[IO]	.	.	.	.	.	.	.	0.0943	.	.
	.	.	.	.	.	.	.	(6.48)	.	.
Change RIO	.	.	.	.	.	.	.	.	-0.0092	.
	.	.	.	.	.	.	.	.	(-3.08)	.
RIO	.	.	.	.	.	.	.	.	.	-0.1428
	.	.	.	.	.	.	.	.	.	(-5.76)
Avg. adjrsq	0.0141	0.0517	0.0468	0.0220	0.0504	0.0236	0.0015	0.0212	0.0005	0.0423

Table III. - *Continued*

Panel A.3. Medium firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.1185	0.1272	0.1417	0.1141	0.1262	0.1406	0.1373	0.1315	0.1369	0.1430
	(3.91)	(4.10)	(4.78)	(3.82)	(4.08)	(4.92)	(4.57)	(4.26)	(4.58)	(4.81)
AIO (level)	0.0552	.	.	.	.	.	.	.	.	.
	(3.94)	.	.	.	.	.	.	.	.	.
AIO (slope)	.	0.0753	.	.	.	.	.	.	.	.
	.	(6.06)	.	.	.	.	.	.	.	.
AIO (residual)	.	.	-0.0783	.	.	.	.	.	.	.
	.	.	(-5.41)	.	.	.	.	.	.	.
E[IO]	.	.	.	0.0664	.	.	.	.	.	.
	.	.	.	(4.73)	.	.	.	.	.	.
Change AIO (level)	.	.	.	.	0.0733	.	.	.	.	.
	.	.	.	.	(5.84)	.	.	.	.	.
Change AIO (slope)	.	.	.	.	.	0.0247	.	.	.	.
	.	.	.	.	.	(2.25)	.	.	.	.
Change AIO (residual)	.	.	.	.	.	.	-0.0058	.	.	.
	.	.	.	.	.	.	(-1.81)	.	.	.
Change E[IO]	.	.	.	.	.	.	.	0.0360	.	.
	.	.	.	.	.	.	.	(4.29)	.	.
Change RIO	.	.	.	.	.	.	.	.	0.0028	.
	.	.	.	.	.	.	.	.	(0.79)	.
RIO	.	.	.	.	.	.	.	.	.	-0.0696
	.	.	.	.	.	.	.	.	.	(-6.47)
Avg. adjrsq	0.0196	0.0285	0.0316	0.0252	0.0289	0.0106	0.0014	0.0077	0.0016	0.0245

Table III. - *Continued*

Panel A.4. Large firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.1213	0.1414	0.1413	0.1257	0.1423	0.1397	0.1417	0.1391	0.1417	0.1418
	(4.43)	(5.03)	(5.05)	(4.55)	(5.07)	(5.20)	(5.14)	(5.16)	(5.13)	(5.09)
AIO (level)	0.0220	.	.	.	.	.	.	.	.	.
	(2.55)	.	.	.	.	.	.	.	.	.
AIO (slope)	.	0.0159	.	.	.	.	.	.	.	.
	.	(1.56)	.	.	.	.	.	.	.	.
AIO (residual)	.	.	-0.0264	.	.	.	.	.	.	.
	.	.	(-2.61)	.	.	.	.	.	.	.
E[IO]	.	.	.	0.0174	.	.	.	.	.	.
	.	.	.	(2.00)	.	.	.	.	.	.
Change AIO (level)	.	.	.	.	0.0192	.	.	.	.	.
	.	.	.	.	(1.82)	.	.	.	.	.
Change AIO (slope)	.	.	.	.	.	-0.0202	.	.	.	.
	.	.	.	.	.	(-3.35)	.	.	.	.
Change AIO (residual)	.	.	.	.	.	.	-0.0006	.	.	.
	.	.	.	.	.	.	(-0.15)	.	.	.
Change E[IO]	.	.	.	.	.	.	.	-0.0062	.	.
	.	.	.	.	.	.	.	(-0.85)	.	.
Change RIO	.	.	.	.	.	.	.	.	0.0027	.
	.	.	.	.	.	.	.	.	(0.55)	.
RIO	.	.	.	.	.	.	.	.	.	-0.0078
	.	.	.	.	.	.	.	.	.	(-1.16)
Avg. adjrsq	0.0100	0.0082	0.0100	0.0098	0.0093	0.0136	0.0025	0.0058	0.0029	0.0039

Table III. - *Continued*

Panel B. Other institutional trading variables

Panel B.1. All firms						Panel B.2. Small firms					
	(11)	(12)	(13)	(14)	(15)		(11)	(12)	(13)	(14)	(15)
Intercept	0.1441	0.1439	0.1348	0.1382	0.1331	Intercept	0.1546	0.1607	0.1428	0.1444	0.1430
	(4.49)	(4.46)	(4.98)	(4.47)	(4.90)		(4.27)	(4.49)	(4.15)	(4.18)	(4.66)
Change IO	0.0017	.	.	.	.	Change IO	0.0043	.	.	.	.
	(0.63)	.	.	.	.		(1.08)	.	.	.	.
IO	.	0.0052	.	.	.	IO	.	0.0150	.	.	.
	.	(0.66)	.	.	.		.	(1.53)	.	.	.
MF herding	.	.	-0.0033	.	.	MF herding	.	.	-0.0064	.	.
	.	.	(-0.90)	.	.		.	.	(-1.26)	.	.
Nagel RIO	.	.	.	0.0169	.	Nagel RIO	.	.	.	0.0270	.
	.	.	.	(3.10)	.		.	.	.	(3.94)	.
Persistence	.	.	.	.	-0.0028	Persistence	.	.	.	.	0.0008
	.	.	.	.	(-0.53)		.	.	.	.	(0.15)
Avg. adjrsq	0.0004	0.0051	0.0014	0.0044	0.0022	Avg. adjrsq	0.0003	0.0048	-0.0024	0.0063	0.0013

Panel B.3. Medium firms						Panel B.4. Large firms					
	(11)	(12)	(13)	(14)	(15)		(11)	(12)	(13)	(14)	(15)
Intercept	0.1366	0.1325	0.1387	0.1350	0.1248	Intercept	0.1417	0.1343	0.1390	0.1394	0.1347
	(4.57)	(4.35)	(4.23)	(4.48)	(4.86)		(5.13)	(5.02)	(4.97)	(4.92)	(4.86)
Change IO	0.0078	.	.	.	.	Change IO	0.0026	.	.	.	.
	(2.08)	.	.	.	.		(0.53)	.	.	.	.
IO	.	0.0167	.	.	.	IO	.	0.0053	.	.	.
	.	(2.30)	.	.	.		.	(1.03)	.	.	.
MF herding	.	.	-0.0041	.	.	MF herding	.	.	-0.0020	.	.
	.	.	(-0.93)	.	.		.	.	(-0.28)	.	.
Nagel RIO	.	.	.	0.0145	.	Nagel RIO	.	.	.	0.0065	.
	.	.	.	(2.15)	.		.	.	.	(0.87)	.
Persistence	.	.	.	.	-0.0010	Persistence	.	.	.	.	-0.0038
	.	.	.	.	(-0.15)		.	.	.	.	(-0.72)
Avg. adjrsq	0.0020	0.0064	0.0018	0.0047	0.0041	Avg. adjrsq	0.0021	0.0037	0.0029	0.0032	0.0053

TABLE IV. Correlations between abnormal institutional ownership and other variables

This table presents correlations between abnormal institutional ownership and other variables. The level, slope, and residual components of abnormal institutional ownership are calculated by de-trending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Accruals, asset growth, and book-to-market ratios are defined as in Sloan (1996), Cooper et al. (2008), and Fama and French (2008), respectively. DT Issuances is the composite share issuances measure as in Daniel and Titman (2006). Firm size is a firm's market capitalization. Gross profits is the gross profitability measure as defined in Novy-Marx (2012). Idiosyncratic risk (Idio. risk) is constructed following the methodology of Ang, Hodrick, Xing, and Zhang (2009). Investments-to-assets is as defined in Stambaugh et al. (2012). Momentum is defined as the compound return between month's t-12 and t-2. A similar definition was used in Fama and French (2008). Net stock issuances (NS) is defined as in Fama and French (2008). Ohlson's (1980) O-score (O-score) is as defined in Chen, Novy-Marx, and Zhang (2011). Return on assets (ROA) is as defined in Fama and French (2006) Return on equity (ROE) is as defined in Chen et al. (2011). All variables are standardized by their cross-sectional mean and standard deviation.

Panel B. Correlations between abnormal institutional ownership variables and other financial variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) AIO (level)	1																
(2) AIO (slope)	0.0125	1															
(3) AIO (residual)	0.0455	-0.0585	1														
(4) Accruals	-0.0524	0.0689	0.0387	1													
(5) Asset growth	-0.0514	0.0204	0.0191	0.1895	1												
(6) Book-to-market	-0.0438	-0.1206	-0.0543	-0.1383	-0.0796	1											
(7) DT Issuances	-0.0407	0.0971	0.0346	0.1097	0.1693	-0.1338	1										
(8) Firm size	0.1415	-0.0552	-0.0061	-0.0227	-0.0122	-0.0674	-0.0646	1									
(9) Gross profits	0.0476	0.0323	0.0021	0.0368	-0.0577	-0.1242	-0.1460	0.0076	1								
(10) Idio. Risk	-0.3032	0.0125	-0.0106	0.0641	0.0514	-0.0294	0.1924	-0.1452	-0.0438	1							
(11) Invest. to assets	-0.0167	0.0038	0.0053	-0.0513	0.3599	-0.0321	0.0929	0.0004	-0.0617	0.0243	1						
(12) Momentum	-0.0737	0.1217	0.0797	-0.0003	0.0037	-0.0993	0.0368	-0.0004	0.0395	0.0524	-0.0144	1					
(13) NS	-0.0648	0.0505	0.0159	0.0889	0.1981	-0.0714	0.3899	-0.0290	-0.0894	0.0963	0.0891	0.0071	1				
(14) O-score	-0.2618	-0.0279	-0.0101	-0.0637	0.0224	0.0683	0.1724	-0.1543	-0.3548	0.1981	0.0422	0.0375	0.0795	1			
(15) ROA	0.0854	0.0285	0.0100	0.0584	-0.2543	-0.0288	-0.1401	0.0293	0.2112	-0.0943	-0.1723	-0.0124	-0.0883	-0.3377	1		
(16) ROE	0.0179	0.0208	0.0034	0.0350	0.0144	-0.0241	-0.0347	0.0089	0.0729	-0.0260	-0.0061	-0.0024	0.0052	-0.0985	0.1429	1	
(17) Share turnover	0.3031	0.0911	0.0972	0.1024	0.0427	-0.2112	0.2237	0.0000	-0.0027	0.2586	0.0213	0.1664	0.0724	-0.0242	-0.0200	-0.0004	1

Table V. Fama-MacBeth regressions of annual stock returns on abnormal institutional ownership or residual institutional ownership and other variables

The table reports Fama-MacBeth (1973) coefficient estimates from predictive regressions of annual returns on lagged abnormal institutional ownership and other financial variables. Returns are the annual return from July of year t until June of year t+1. The level, slope, and residual components of abnormal institutional ownership are calculated by de-trending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Persistence is the Dasgupta et al. (2011) institutional trade persistence measure and Nagel RIO is the Nagel (2005) residual institutional ownership measure. Expected institutional ownership (E[IO]) and residual institutional ownership (RIO) are the fitted and residual values after regressing institutional ownership on a constant and linear time-trend term. All independent variables are standardized each quarter using their cross-sectional mean and standard deviation. I exclude financials (SIC codes 6000-6999), utilities (SIC Codes 4900-4999), and stocks with price less than $5 or greater than $1,000. I only use common shares with share codes equal to 10 or 11. Reported t-statistics (in parentheses) are adjusted for autocorrelation using Newey-West (1987) standard errors. There are 3 different controls groups. Control group 1 is Daniel and Titman (2006) composite issuances and return on assets, control group 2 is all of the variables in control group 1 plus gross profitability and share turnover, control group 3 is all of the variables in control group 2 plus accruals, asset growth, book-to-market ratio, firm size, idiosyncratic risk, investments to assets, momentum, net issuances, O-score, and return on equity.

Panel A. Abnormal institutional ownership variables

Panel A.1. All firms						Panel A.2. Small firms					
	(1)	(2)	(3)	(4)	(5)		(1)	(2)	(3)	(4)	(5)
Intercept	0.1439	0.1157	0.1298	0.1315	0.1012	Intercept	0.1911	0.0972	0.1081	0.1424	-0.0524
	(4.46)	(4.54)	(4.93)	(4.93)	(3.07)		(5.44)	(4.06)	(3.92)	(2.59)	(-0.13)
AIO (level)	0.0402	0.0338	0.0179	0.0224	0.0183	AIO (level)	0.0690	0.0299	0.0049	-0.0246	-0.0661
	(3.66)	(4.69)	(2.85)	(3.97)	(2.99)		(4.06)	(2.13)	(0.27)	(-0.48)	(-0.80)
AIO (slope)	0.0895	0.0941	0.1034	0.1047	0.1062	AIO (slope)	0.1341	0.1471	0.1450	0.1179	0.1660
	(8.68)	(6.13)	(5.98)	(5.87)	(5.70)		(7.60)	(6.36)	(3.46)	(1.76)	(4.52)
AIO (residual)	-0.0911	-0.0942	-0.0849	-0.0810	-0.0828	AIO (residual)	-0.1338	-0.1646	-0.1758	-0.1965	-0.1564
	(-5.87)	(-5.22)	(-4.98)	(-4.82)	(-4.46)		(-5.14)	(-4.90)	(-5.09)	(-4.89)	(-4.52)
MF herding	.	-0.0038	-0.0057	-0.0046	-0.0071	MF herding	.	-0.0022	-0.0007	-0.0059	-0.0333
	.	(-0.93)	(-1.48)	(-1.22)	(-2.05)		.	(-0.37)	(-0.14)	(-0.68)	(-1.18)
Nagel RIO	.	0.0327	0.0330	0.0278	0.0333	Nagel RIO	.	0.1054	0.1225	0.1073	0.1208
	.	(2.31)	(2.25)	(2.13)	(2.15)		.	(4.60)	(3.58)	(3.37)	(2.34)
Persistence	.	0.0035	0.0013	0.0011	-0.0019	Persistence	.	0.0123	0.0223	0.0694	0.0118
	.	(0.67)	(0.39)	(0.35)	(-0.92)		.	(1.68)	(1.03)	(1.05)	(0.75)
Control group 1	No	No	Yes	Yes	Yes	Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes	Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes	Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0704	0.0899	0.0939	0.1080	0.1305	Avg adjrsq	0.1005	0.1447	0.1392	0.1398	0.1810

Table V. - *Continued*

Panel A.3. Medium firms	(1)	(2)	(3)	(4)	(5)
Intercept	0.1111	0.1067	0.1202	0.1227	0.0904
	(3.62)	(3.82)	(4.42)	(4.18)	(1.65)
AIO (level)	0.0587	0.0388	0.0242	0.0228	0.0205
	(4.59)	(5.45)	(2.83)	(2.58)	(1.42)
AIO (slope)	0.0730	0.0868	0.0997	0.1009	0.1026
	(6.30)	(5.68)	(6.32)	(6.14)	(6.16)
AIO (residual)	-0.0764	-0.0907	-0.0811	-0.0772	-0.0745
	(-5.36)	(-5.36)	(-4.19)	(-4.43)	(-3.98)
MF herding	.	-0.0089	-0.0104	-0.0083	-0.0092
	.	(-1.65)	(-1.99)	(-1.57)	(-1.51)
Nagel RIO	.	0.0269	0.0192	0.0226	0.0140
	.	(2.53)	(1.34)	(1.40)	(0.82)
Persistence	.	0.0077	0.0042	0.0030	-0.0001
	.	(1.35)	(1.24)	(0.78)	(-0.04)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0789	0.0924	0.0997	0.1166	0.1436

Panel A.4. Large firms	(1)	(2)	(3)	(4)	(5)
Intercept	0.1230	0.1335	0.1329	0.1368	0.1109
	(4.42)	(4.01)	(4.28)	(3.81)	(1.77)
AIO (level)	0.0219	0.0095	0.0054	0.0011	0.0097
	(2.33)	(0.88)	(0.47)	(0.09)	(0.62)
AIO (slope)	0.0148	0.0206	0.0214	0.0207	0.0155
	(1.45)	(1.52)	(1.29)	(1.22)	(0.89)
AIO (residual)	-0.0277	-0.0340	-0.0306	-0.0291	-0.0294
	(-2.79)	(-3.03)	(-2.74)	(-2.44)	(-2.46)
MF herding	.	-0.0025	-0.0058	-0.0069	-0.0028
	.	(-0.43)	(-1.21)	(-1.70)	(-0.83)
Nagel RIO	.	0.0101	0.0139	0.0118	0.0013
	.	(0.80)	(0.92)	(0.74)	(0.05)
Persistence	.	0.0020	0.0023	0.0024	-0.0008
	.	(0.44)	(0.62)	(0.69)	(-0.28)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0283	0.0327	0.0569	0.0912	0.1413

Panel B. Residual institutional ownership variables

Panel B.1. All firms	(1)	(2)	(3)	(4)	(5)
Intercept	0.1439	0.1224	0.1263	0.1282	0.1090
	(4.46)	(4.62)	(4.36)	(4.38)	(3.10)
E[IO]	0.0485	0.0366	0.0180	0.0192	0.0137
	(4.00)	(4.96)	(2.69)	(2.90)	(1.98)
RIO	-0.0906	-0.0906	-0.0734	-0.0705	-0.0732
	(-7.03)	(-5.17)	(-5.54)	(-5.45)	(-5.02)
MF herding	.	-0.0035	-0.0062	-0.0057	-0.0076
	.	(-0.86)	(-1.61)	(-1.57)	(-2.26)
Nagel RIO	.	0.0395	0.0460	0.0419	0.0502
	.	(2.75)	(2.85)	(2.84)	(2.92)
Persistence	.	0.0189	0.0130	0.0126	0.0083
	.	(4.18)	(4.10)	(3.84)	(3.05)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0419	0.0515	0.0547	0.0685	0.0915

Panel B.2. Small firms	(1)	(2)	(3)	(4)	(5)
Intercept	0.1913	0.1293	0.1012	0.0842	-0.0034
	(5.61)	(4.70)	(3.78)	(3.22)	(-0.01)
E[IO]	0.0901	0.0704	0.0445	0.0304	-0.0315
	(5.62)	(4.89)	(2.61)	(0.95)	(-0.39)
RIO	-0.1353	-0.1522	-0.1461	-0.1519	-0.2030
	(-6.04)	(-4.58)	(-5.18)	(-5.48)	(-4.55)
MF herding	.	-0.0066	-0.0055	-0.0039	0.0013
	.	(-0.89)	(-0.69)	(-0.62)	(0.19)
Nagel RIO	.	0.0627	0.1079	0.1242	0.3588
	.	(3.63)	(3.73)	(2.77)	(1.51)
Persistence	.	0.0401	0.0263	0.0285	-0.0679
	.	(4.68)	(3.59)	(3.26)	(-0.84)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0602	0.0812	0.0738	0.0450	0.1100

Table V. - *Continued*

Panel B.3. Medium firms	(1)	(2)	(3)	(4)	(5)
Intercept	0.1215	0.1198	0.1219	0.1252	0.0732
	(4.06)	(4.20)	(4.09)	(3.90)	(1.08)
E[IO]	0.0611	0.0444	0.0285	0.0238	0.0302
	(4.28)	(4.57)	(2.44)	(1.86)	(1.68)
RIO	-0.0675	-0.0835	-0.0681	-0.0668	-0.0636
	(-6.86)	(-6.14)	(-5.96)	(-6.41)	(-5.91)
MF herding	.	-0.0059	-0.0102	-0.0089	-0.0086
	.	(-1.19)	(-2.04)	(-1.76)	(-1.38)
Nagel RIO	.	0.0299	0.0287	0.0346	0.0179
	.	(2.43)	(1.76)	(1.66)	(0.85)
Persistence	.	0.0206	0.0159	0.0149	0.0111
	.	(4.24)	(4.80)	(4.07)	(3.22)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0473	0.0531	0.0576	0.0750	0.1040

Panel B.4. Large firms	(1)	(2)	(3)	(4)	(5)
Intercept	0.1267	0.1305	0.1298	0.1340	0.1098
	(4.57)	(4.09)	(4.38)	(3.93)	(1.84)
E[IO]	0.0176	0.0114	0.0067	0.0021	0.0059
	(1.97)	(1.14)	(0.64)	(0.17)	(0.44)
RIO	-0.0079	-0.0067	0.0018	0.0022	0.0078
	(-1.19)	(-0.84)	(0.24)	(0.25)	(0.90)
MF herding	.	-0.0012	-0.0045	-0.0055	-0.0007
	.	(-0.20)	(-0.89)	(-1.23)	(-0.21)
Nagel RIO	.	-0.0004	0.0013	-0.0007	-0.0071
	.	(-0.04)	(0.10)	(-0.05)	(-0.32)
Persistence	.	-0.0018	-0.0021	-0.0018	-0.0057
	.	(-0.36)	(-0.51)	(-0.43)	(-1.93)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0138	0.0182	0.0413	0.0761	0.1282

Table VI. Fama-MacBeth regressions of annual stock returns on abnormal ownership and other variables by ownership subgroup

The table reports Fama-MacBeth (1973) coefficient estimates from predictive regressions of annual returns on lagged abnormal ownership and other financial variables. Each model is estimated using abnormal bank ownership, insurance, mutual fund, and other financial institutions ownership. Returns are the annual return from July of year t until June of year t+1. The level, slope, and residual components of abnormal ownership are calculated by de-trending bank, insurance, mutual fund, and other ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Persistence is the Dasgupta et al. (2011) institutional trade persistence measure and residual institutional ownership is the Nagel (2005) residual institutional ownership measure. All independent variables are standardized each quarter using their cross-sectional mean and standard deviation. I exclude financials (SIC codes 6000-6999), utilities (SIC Codes 4900-4999), and stocks with price less than \$5 or greater than \$1,000. I only use common shares with share codes equal to 10 or 11. Reported t-statistics (in parentheses) are adjusted for autocorrelation using Newey-West (1987) standard errors. There are 3 different controls groups. Control group 1 is Daniel and Titman (2006) composite issuances and return on assets, control group 2 is all of the variables in control group 1 plus gross profitability and share turnover, control group 3 is all of the variables in control group 2 plus accruals, asset growth, book-to-market ratio, firm size, idiosyncratic risk, investments to assets, momentum, net issuances, O-score, and return on equity.

Panel A. Banks	(1)	(2)	(3)	(4)	(5)
Intercept	0.1452	0.1216	0.1316	0.1339	0.0972
	(4.48)	(4.96)	(5.00)	(4.97)	(2.92)
AO (level)	0.0261	0.0294	0.0131	0.0135	0.0132
	(3.20)	(4.31)	(3.50)	(3.92)	(4.52)
AO (slope)	0.0537	0.0637	0.0592	0.0607	0.0616
	(6.58)	(6.29)	(5.38)	(5.18)	(5.25)
AO (residual)	-0.0425	-0.0411	-0.0339	-0.0322	-0.0311
	(-5.37)	(-5.34)	(-5.42)	(-5.24)	(-5.45)
MF herding	.	-0.0043	-0.0055	-0.0052	-0.0069
	.	(-1.24)	(-1.59)	(-1.49)	(-2.09)
Nagel own.	.	0.0114	0.0152	0.0122	0.0124
	.	(1.70)	(1.66)	(1.88)	(1.55)
Persistence	.	-0.0034	-0.0034	-0.0036	-0.0051
	.	(-0.67)	(-1.05)	(-1.04)	(-2.38)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0237	0.0396	0.0506	0.0648	0.0882

Panel B. Insurance companies	(1)	(2)	(3)	(4)	(5)
Intercept	0.1514	0.1296	0.1328	0.1342	0.1000
	(4.46)	(5.15)	(4.89)	(4.92)	(2.83)
AO (level)	0.0146	0.0187	0.0111	0.0136	0.0139
	(1.78)	(3.51)	(1.71)	(2.15)	(1.99)
AO (slope)	0.0369	0.0340	0.0341	0.0344	0.0373
	(5.80)	(3.70)	(4.04)	(4.02)	(3.91)
AO (residual)	-0.0307	-0.0341	-0.0286	-0.0281	-0.0268
	(-4.12)	(-4.96)	(-5.02)	(-5.05)	(-4.68)
MF herding	.	-0.0030	-0.0052	-0.0046	-0.0066
	.	(-0.82)	(-1.52)	(-1.36)	(-2.11)
Nagel own.	.	0.0085	0.0095	0.0062	0.0074
	.	(1.33)	(1.17)	(1.12)	(1.13)
Persistence	.	-0.0023	-0.0014	-0.0012	-0.0033
	.	(-0.44)	(-0.46)	(-0.38)	(-1.59)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0123	0.0214	0.0392	0.0542	0.0792

Table VI. - *Continued*

Panel C. Mutual funds					
	(1)	(2)	(3)	(4)	(5)
Intercept	0.1471	0.1197	0.1237	0.1267	0.0948
	(4.45)	(5.05)	(5.02)	(4.95)	(3.00)
AO (level)	0.0325	0.0392	0.0363	0.0411	0.0420
	(3.38)	(4.39)	(4.60)	(5.91)	(5.18)
AO (slope)	0.0910	0.0852	0.0807	0.0809	0.0827
	(7.02)	(5.09)	(4.85)	(4.75)	(4.49)
AO (residual)	-0.0780	-0.0661	-0.0540	-0.0524	-0.0493
	(-4.75)	(-4.26)	(-3.81)	(-3.91)	(-3.97)
MF herding	.	-0.0064	-0.0078	-0.0066	-0.0090
	.	(-2.15)	(-2.86)	(-2.26)	(-3.42)
Nagel own.	.	-0.0072	-0.0102	-0.0129	-0.0132
	.	(-0.96)	(-1.66)	(-1.85)	(-2.55)
Persistence	.	-0.0091	-0.0062	-0.0061	-0.0090
	.	(-1.55)	(-1.69)	(-1.97)	(-3.99)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0585	0.0715	0.0756	0.0893	0.1137

Panel D. Other financial institutions					
	(1)	(2)	(3)	(4)	(5)
Intercept	0.1494	0.1181	0.1274	0.1300	0.0991
	(4.44)	(4.87)	(5.13)	(5.08)	(3.12)
AO (level)	0.0271	0.0379	0.0205	0.0214	0.0163
	(2.52)	(6.72)	(5.71)	(6.43)	(4.29)
AO (slope)	0.0572	0.0522	0.0545	0.0546	0.0529
	(8.70)	(7.01)	(6.78)	(6.90)	(7.96)
AO (residual)	-0.0546	-0.0445	-0.0387	-0.0378	-0.0387
	(-8.17)	(-7.18)	(-6.99)	(-6.74)	(-5.67)
MF herding	.	-0.0014	-0.0032	-0.0025	-0.0046
	.	(-0.34)	(-0.76)	(-0.59)	(-1.10)
Nagel own.	.	-0.0012	0.0036	0.0024	0.0065
	.	(-0.15)	(0.47)	(0.35)	(0.87)
Persistence	.	0.0009	0.0006	0.0007	-0.0013
	.	(0.16)	(0.17)	(0.21)	(-0.59)
Control group 1	No	No	Yes	Yes	Yes
Control group 2	No	No	No	Yes	Yes
Control group 3	No	No	No	No	Yes
Avg adjrsq	0.0328	0.0382	0.0486	0.0641	0.0864

Table VII. Abnormal institutional ownership deciles: descriptive statistics

At the end of June of each year from 1980 to 2010 I allocate firms to ten decile portfolios based on abnormal institutional ownership. The level, slope, and residual components of abnormal institutional ownership are calculated by de-trending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table reports the time series average of annual medians at the time of portfolio formation for 18 financial variables. The institutional trading variables are the level, slope, and residual components of abnormal institutional ownership (AIO), expected institutional ownership (E[IO]), institutional ownership (IO), mutual fund herding (MF herding), Nagel residual institutional ownership (Nagel RIO), Dasgupta et al. (2011) institutional trade persistence (Persistence), and residual institutional ownership (RIO). The other financial variables are asset growth, book-to-market ratio (BEME), Daniel and Titman (2006) Composite issuances (DT issuances), firm size, idiosyncratic risk (Idio. risk), illiquidity, market beta, momentum, and return on equity (ROE).

Panel A. Abnormal institutional ownership (level) decile portfolio characteristics

Panel A.1. Institutional trading variables

Decile	AIO (level)	AIO (slope)	AIO (residual)	E[IO]	IO	MF herding	Nagel RIO	Persistence	RIO
1(Low)	0.1640	0.0029	0.0001	0.1681	0.1564	0.0731	-0.6841	0.0000	-0.0038
2	0.3402	0.0058	0.0015	0.3390	0.3413	0.0414	0.0982	0.0000	0.0015
3	0.4251	0.0057	0.0042	0.4206	0.4293	0.0329	0.1740	0.0667	0.0083
4	0.4885	0.0055	0.0043	0.4847	0.4936	0.0333	0.2228	0.0667	0.0087
5	0.5439	0.0054	0.0042	0.5349	0.5489	0.0278	0.2991	0.0667	0.0135
6	0.5929	0.0049	0.0054	0.5838	0.5994	0.0244	0.3487	0.0667	0.0157
7	0.6394	0.0045	0.0052	0.6285	0.6454	0.0222	0.4620	0.0000	0.0176
8	0.6858	0.0042	0.0035	0.6701	0.6893	0.0175	0.6636	0.0000	0.0204
9	0.7384	0.0036	0.0051	0.7169	0.7450	0.0181	1.2286	0.0000	0.0290
10(High)	0.8188	0.0033	0.0036	0.7894	0.8267	0.0167	2.4516	0.0000	0.0392
Spread(1-10)	-0.6548	-0.0004	-0.0035	-0.6212	-0.6703	0.0563	-3.1357	0.0000	-0.0430
t (spread)	(-59.30)	(-1.41)	(-1.24)	(-50.97)	(-58.81)	(4.74)	(-6.83)	.	(-6.67)

Panel A.2. Other financial variables

Decile	Asset growth	BEME	DT issuances	Firm size	Idio. risk	Illiquidity	Market beta	Momentum	ROE
1(Low)	0.1139	0.5660	0.0051	82.1105	2.6106	0.5602	1.0147	0.1289	0.0877
2	0.1079	0.5810	-0.0052	188.1685	2.2290	0.2045	1.0998	0.1068	0.1054
3	0.1022	0.5713	-0.0194	356.4095	2.0141	0.1202	1.1073	0.1020	0.1163
4	0.1052	0.5604	-0.0267	492.7437	1.8765	0.0616	1.1445	0.1073	0.1239
5	0.1015	0.5666	-0.0357	609.3052	1.8049	0.0405	1.1203	0.1234	0.1298
6	0.0994	0.5547	-0.0257	693.7528	1.7228	0.0232	1.1116	0.1277	0.1320
7	0.0953	0.5524	-0.0261	766.6882	1.6984	0.0153	1.1046	0.1186	0.1327
8	0.0905	0.5652	-0.0246	900.4032	1.6065	0.0102	1.1408	0.1158	0.1314
9	0.0968	0.5378	0.0024	992.1930	1.5768	0.0070	1.1242	0.1347	0.1332
10(High)	0.1139	0.5335	0.0132	996.2087	1.6159	0.0057	1.1462	0.1320	0.1354
Spread(1-10)	0.0000	0.0326	-0.0082	-914.0982	0.9947	0.5545	-0.1316	-0.0031	-0.0477
t (spread)	(0.00)	(1.91)	(-0.85)	(-25.19)	(14.82)	(7.40)	(-3.56)	(-0.18)	(-12.09)

Table VII. - *Continued*

Panel B. Abnormal institutional ownership (slope) decile portfolio characteristics

Panel B.1. Institutional trading variables

Decile	AIO (slope)	AIO (level)	AIO (residual)	E[IO]	IO	MF herding	Nagel RIO	Persistence	RIO
1(Low)	-0.0099	0.4455	0.0127	0.4436	0.4640	0.0404	0.5681	0.0000	0.0113
2	-0.0027	0.4070	0.0023	0.4001	0.4109	0.0249	0.4052	0.0000	0.0056
3	-0.0001	0.3663	0.0010	0.3628	0.3674	0.0253	0.1559	0.0000	0.0021
4	0.0017	0.3919	0.0009	0.3917	0.3951	0.0220	0.1567	0.0000	0.0021
5	0.0031	0.4330	0.0007	0.4322	0.4336	0.0220	0.1658	0.0000	0.0016
6	0.0046	0.4492	0.0019	0.4463	0.4514	0.0233	0.2141	0.0000	0.0056
7	0.0062	0.4632	0.0013	0.4600	0.4642	0.0196	0.2580	0.2000	0.0048
8	0.0083	0.4489	-0.0004	0.4433	0.4550	0.0191	0.2368	0.0667	0.0052
9	0.0117	0.4379	0.0028	0.4317	0.4446	0.0271	0.2713	0.3000	0.0073
10(High)	0.0206	0.4329	-0.0024	0.4448	0.4276	0.0463	0.2441	1.5000	-0.0123
Spread(1-10)	-0.0304	0.0126	0.0151	-0.0012	0.0364	-0.0059	0.3240	-1.5000	0.0236
t (spread)	(-36.73)	(1.26)	(4.48)	(-0.09)	(3.00)	(-1.20)	(5.28)	(-8.76)	(2.30)

Panel B.2. Other financial variables

Decile	Asset growth	BEME	DT issuances	Firm size	Idio. risk	Illiquidity	Market beta	Momentum	ROE
1(Low)	0.0914	0.6864	0.0197	206.5791	2.2479	0.0513	1.1824	0.0378	0.0771
2	0.0867	0.6317	-0.0195	241.3958	2.0417	0.0765	1.0560	0.0741	0.1018
3	0.0851	0.5919	-0.0285	364.1265	1.9491	0.1298	0.9944	0.0970	0.1077
4	0.0860	0.5861	-0.0496	406.3193	1.8956	0.1049	0.9951	0.1050	0.1195
5	0.0910	0.5670	-0.0430	481.6894	1.8214	0.0875	1.0348	0.1018	0.1218
6	0.0937	0.5628	-0.0456	470.5771	1.8104	0.0776	1.0250	0.1234	0.1266
7	0.0919	0.5697	-0.0323	415.6950	1.8499	0.0696	1.0654	0.1150	0.1236
8	0.1049	0.5600	-0.0065	377.6570	1.9763	0.0798	1.1099	0.1328	0.1231
9	0.1317	0.5433	0.0371	275.9965	2.0844	0.0931	1.1747	0.1575	0.1252
10(High)	0.2025	0.4383	0.1492	273.3936	2.3032	0.0907	1.3093	0.2527	0.1336
Spread(1-10)	-0.1111	0.2481	-0.1295	-66.8145	-0.0553	-0.0394	-0.1269	-0.2148	-0.0565
t (spread)	(-11.83)	(12.57)	(-9.39)	(-3.80)	(-1.78)	(-3.69)	(-4.91)	(-6.80)	(-16.75)

Panel C. Abnormal institutional ownership (residual) decile portfolio characteristics

Panel C.1. Institutional trading variables

Decile	AIO (residual)	AIO (level)	AIO (slope)	E[IO]	IO	MF herding	Nagel RIO	Persistence	RIO
1(Low)	-0.0890	0.4613	0.0079	0.4829	0.3472	0.0530	-0.1121	-0.0667	-0.1075
2	-0.0436	0.4359	0.0057	0.4474	0.3907	0.0256	0.0590	-0.0667	-0.0482
3	-0.0246	0.4224	0.0042	0.4267	0.3978	0.0236	0.0924	-0.0667	-0.0265
4	-0.0126	0.3895	0.0034	0.3936	0.3758	0.0260	0.0351	-0.0667	-0.0123
5	-0.0029	0.3473	0.0026	0.3495	0.3443	0.0199	0.0011	0.0000	-0.0024
6	0.0064	0.3755	0.0028	0.3765	0.3823	0.0218	0.1123	0.0000	0.0090
7	0.0169	0.4124	0.0033	0.4105	0.4295	0.0247	0.2778	0.0667	0.0225
8	0.0309	0.4412	0.0039	0.4335	0.4722	0.0215	0.4532	0.2000	0.0399
9	0.0534	0.4659	0.0047	0.4539	0.5210	0.0256	0.6064	0.9000	0.0667
10(High)	0.1064	0.4975	0.0056	0.4726	0.6265	0.0346	1.1883	1.8833	0.1366
Spread(1-10)	-0.1953	-0.0362	0.0023	0.0103	-0.2793	0.0184	-1.3004	-1.9500	-0.2441
t (spread)	(-32.97)	(-3.55)	(3.30)	(1.11)	(-19.69)	(4.74)	(-6.17)	(-13.49)	(-33.84)

Table VII. - *Continued*

Panel C.2. Other financial variables									
Decile	Asset growth	BEME	DT issuances	Firm size	Idio. risk	Illiquidity	Market beta	Momentum	ROE
1(Low)	0.1103	0.6340	0.0653	269.2746	2.2789	0.0724	1.2166	0.0696	0.0975
2	0.1023	0.6040	0.0086	328.8708	2.0658	0.0870	1.1331	0.0804	0.1084
3	0.0916	0.5942	-0.0258	311.0929	1.9627	0.0979	1.0600	0.0888	0.1128
4	0.0925	0.5746	-0.0468	348.4911	1.9192	0.1225	1.0095	0.0981	0.1194
5	0.0897	0.5655	-0.0469	323.5517	1.9399	0.1408	0.9896	0.1085	0.1174
6	0.0919	0.5819	-0.0473	322.9651	1.9041	0.1149	0.9993	0.1116	0.1184
7	0.0967	0.5606	-0.0392	335.8681	1.8896	0.0958	1.0237	0.1197	0.1194
8	0.1024	0.5596	-0.0189	338.3390	1.9532	0.0788	1.1046	0.1358	0.1196
9	0.1221	0.5173	0.0136	332.1178	2.0538	0.0670	1.1668	0.1633	0.1209
10(High)	0.1685	0.4728	0.1067	340.0640	2.2058	0.0494	1.3093	0.2331	0.1233
Spread(1-10)	-0.0582	0.1612	-0.0414	-70.7893	0.0732	0.0230	-0.0927	-0.1635	-0.0258
t (spread)	(-7.25)	(6.30)	(-3.51)	(-3.01)	(1.79)	(3.41)	(-3.36)	(-5.40)	(-5.74)

Table VIII. Abnormal institutional ownership portfolio returns

At the end of June of year t stocks are allocated to ten decile portfolios based on abnormal institutional ownership. The level, slope, and residual components of abnormal institutional ownership are calculated by de-trending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Each portfolio is held from July of year t until June of year t+1. Equally-weighted and value-weighted returns are calculated each month. At the time of formation I exclude stocks with price less than \$5 or greater than \$1,000 and exclude financial firms and utilities (SIC codes 6000-6999 and 4900-4999). I only use common equity securities with share code equal to 10 or 11. I report average monthly returns for all firms and for three size-sorted groups. Small firms are defined as firms with market equity less than the 30th percentile, medium firms are defined as firms with market equity greater than or equal to the 30th percentile and less than or equal to the 70th percentile, and large firms are defined as firms with market equity greater than the 70th percentile. Decile breakpoints are based on common shares traded on the New York Stock Exchange (NYSE). Panel A.1 shows average raw returns for equally-weighted portfolios, Panel A.2 shows average raw returns for value-weighted portfolios, Panel B.1 shows Fama and French (1993) alphas for equally-weighted portfolios, and Panel B.2 shows Fama and French (1993) alphas for value-weighted portfolios. The t-statistics are adjusted for auto-correlation using Newey West (1987) standard errors. All reported returns are in decimal form.

Panel A. Raw monthly return portfolios

Panel A.1. Equally-weighted portfolio average monthly raw returns

	Abnormal institutional ownership deciles											
	1 (Low)	2	3	4	5	6	7	8	9	10 (High)	Spread (1-10)	*t* (spread)
AIO (level)	0.0061	0.0121	0.0127	0.0131	0.0143	0.0142	0.0155	0.0142	0.0148	0.0151	-0.0090	(-5.20)
AIO (slope)	-0.0014	0.0029	0.0050	0.0086	0.0092	0.0110	0.0130	0.0144	0.0178	0.0258	-0.0273	(-13.42)
AIO (residual)	0.0280	0.0196	0.0150	0.0115	0.0094	0.0086	0.0072	0.0077	0.0052	0.0005	0.0275	(13.22)

Panel A.2. Value-weighted portfolio average monthly raw returns

	Abnormal institutional ownership deciles											
	1 (Low)	2	3	4	5	6	7	8	9	10 (High)	Spread (1-10)	*t* (spread)
AIO (level)	0.0028	0.0098	0.0097	0.0097	0.0115	0.0112	0.0116	0.0110	0.0124	0.0117	-0.0089	(-3.79)
AIO (slope)	0.0063	0.0098	0.0087	0.0117	0.0102	0.0107	0.0108	0.0117	0.0120	0.0168	-0.0105	(-5.60)
AIO (residual)	0.0164	0.0133	0.0110	0.0111	0.0111	0.0100	0.0094	0.0108	0.0074	0.0047	0.0117	(6.16)

Table VIII. - *Continued*

Panel B. Fama-French monthly alphas

Panel B.1. Equally-weighted portfolio Fama-French monthly alphas

	Abnormal institutional ownership deciles											
	1 (Low)	2	3	4	5	6	7	8	9	10 (High)	Spread (1-10)	*t* (spread)
AIO (level)	-0.0051	0.0001	0.0005	0.0008	0.0020	0.0017	0.0027	0.0017	0.0022	0.0027	-0.0078	(-5.42)
AIO (slope)	-0.0142	-0.0093	-0.0066	-0.0029	-0.0025	-0.0009	0.0008	0.0022	0.0055	0.0140	-0.0282	(-14.68)
AIO (residual)	0.0156	0.0078	0.0033	0.0001	-0.0022	-0.0031	-0.0047	-0.0043	-0.0073	-0.0124	0.0279	(13.66)

Panel B.2. Value-weighted portfolio Fama-French monthly alphas

	Abnormal institutional ownership deciles											
	1 (Low)	2	3	4	5	6	7	8	9	10 (High)	Spread (1-10)	*t* (spread)
AIO (level)	-0.0059	0.0009	0.0005	0.0002	0.0015	0.0010	0.0012	0.0002	0.0012	0.0003	-0.0062	(-3.32)
AIO (slope)	-0.0042	0.0002	0.0000	0.0026	0.0004	0.0006	0.0004	0.0008	0.0004	0.0058	-0.0100	(-6.44)
AIO (residual)	0.0055	0.0028	0.0014	0.0011	0.0018	-0.0002	-0.0002	0.0003	-0.0039	-0.0065	0.0121	(6.60)

Table IX. Abnormal institutional ownership portfolio returns for sub periods and subgroups
At the end of June of year t stocks are allocated to ten decile portfolios based on abnormal institutional ownership. The level, slope, and residual components of abnormal institutional ownership are calculated by de-trending institutional ownership for each security using the Hodrick-Prescott (1997) filter with λ equal to 1600. Each portfolio is held from July of year t until June of year t+1. Equally-weighted and value-weighted returns are calculated each month. At the time of formation I exclude stocks with price less than $5 or greater than $1,000 and exclude financial firms and utilities (SIC codes 6000-6999 and 4900-4999). I only use common equity securities with share code equal to 10 or 11. I report average monthly returns for all firms and for three size-sorted groups. Decile breakpoints are based on common shares traded on the New York Stock Exchange (NYSE). Panels A, B, C, and D show average monthly returns for size subgroups, sub periods, illiquidity, and institutional type subgroups. Size and illiquidity subgroups are constructed using NYSE 30^{th} and 70^{th} percentile breakpoints. The three sub periods are 1980-1989, 1990-1999, and 2000-2010. The four institutional ownership subgroups are banks, insurance companies, mutual funds, and other institutions. The t-statistics (in parentheses) are adjusted for auto-correlation using Newey West (1987) standard errors. All returns are in decimal form.

Panel A. Abnormal institutional ownership low-high portfolio returns by size group

Panel A.1. Average monthly raw returns by size group

	Equally-weighted				Value-weighted			
	All	Small	Medium	Large	All	Small	Medium	Large
AIO (level)	-0.0090	-0.0138	-0.0115	-0.0075	-0.0089	-0.0159	-0.0107	-0.0063
	(-5.20)	(-7.26)	(-4.59)	(-2.36)	(-3.79)	(-7.55)	(-4.44)	(-1.86)
AIO (slope)	-0.0273	-0.0335	-0.0195	-0.0047	-0.0105	-0.0317	-0.0164	-0.0040
	(-13.42)	(-13.80)	(-8.42)	(-2.22)	(-5.60)	(-12.45)	(-8.06)	(-1.70)
AIO (residual)	0.0275	0.0348	0.0170	0.0077	0.0117	0.0311	0.0138	0.0057
	(13.22)	(14.07)	(7.71)	(3.19)	(6.16)	(12.65)	(6.89)	(2.36)

Panel A.2. Fama-French monthly alphas by size group

	Equally-weighted				Value-weighted			
	All	Small	Medium	Large	All	Small	Medium	Large
AIO (level)	-0.0078	-0.0118	-0.0105	-0.0059	-0.0062	-0.0145	-0.0095	-0.0024
	(-5.42)	(-6.45)	(-5.10)	(-2.08)	(-3.32)	(-7.63)	(-4.68)	(-0.81)
AIO (slope)	-0.0282	-0.0346	-0.0211	-0.0039	-0.0100	-0.0335	-0.0172	-0.0034
	(-14.68)	(-14.94)	(-9.49)	(-1.92)	(-6.44)	(-14.03)	(-8.55)	(-1.55)
AIO (residual)	0.0279	0.0356	0.0170	0.0063	0.0121	0.0320	0.0142	0.0047
	(13.66)	(14.46)	(7.99)	(2.59)	(6.60)	(12.93)	(7.34)	(1.96)

Table IX. - *Continued*

Panel B. Abnormal institutional ownership low-high portfolio returns by subperiod

Panel B.1. Average monthly raw returns by subperiod

	Equally-weighted				Value-weighted			
	All	1980s	1990s	2000s	All	1980s	1990s	2000s
AIO (level)	-0.0090	-0.0068	-0.0125	-0.0078	-0.0089	-0.0064	-0.0088	-0.0112
	(-5.20)	(-2.28)	(-5.54)	(-2.26)	(-3.79)	(-2.19)	(-3.30)	(-2.07)
AIO (slope)	-0.0273	-0.0210	-0.0334	-0.0284	-0.0105	-0.0089	-0.0127	-0.0100
	(-13.42)	(-7.43)	(-16.39)	(-6.62)	(-5.60)	(-2.10)	(-4.78)	(-3.47)
AIO (residual)	0.0275	0.0187	0.0355	0.0289	0.0117	0.0089	0.0167	0.0102
	(13.22)	(11.39)	(15.78)	(6.26)	(6.16)	(3.07)	(5.20)	(2.83)

Panel B.2. Fama-French monthly alphas by subperiod

	Equally-weighted				Value-weighted			
	All	1980s	1990s	2000s	All	1980s	1990s	2000s
AIO (level)	-0.0078	-0.0067	-0.0097	-0.0052	-0.0062	-0.0062	-0.0068	-0.0049
	(-5.42)	(-2.38)	(-4.68)	(-1.86)	(-3.32)	(-2.46)	(-2.75)	(-1.31)
AIO (slope)	-0.0282	-0.0220	-0.0318	-0.0287	-0.0100	-0.0096	-0.0111	-0.0095
	(-14.68)	(-7.18)	(-17.34)	(-7.21)	(-6.44)	(-2.76)	(-5.92)	(-3.77)
AIO (residual)	0.0279	0.0182	0.0350	0.0262	0.0121	0.0081	0.0169	0.0093
	(13.66)	(13.49)	(17.61)	(7.71)	(6.60)	(2.99)	(5.22)	(3.52)

Panel C. Abnormal institutional ownership low-high portfolio returns by illiquidity group

Panel C.1. Average monthly raw returns by illiquidity group

	Equally-weighted				Value-weighted			
	All	Liquid	Medium	Illiquid	All	Liquid	Medium	Illiquid
AIO (level)	-0.0090	0.0000	-0.0186	-0.0118	-0.0089	-0.0071	-0.0125	-0.0112
	(-5.20)	(0.02)	(-6.47)	(-5.60)	(-3.79)	(-1.89)	(-4.88)	(-5.25)
AIO (slope)	-0.0273	-0.0123	-0.0251	-0.0327	-0.0105	-0.0059	-0.0163	-0.0263
	(-13.42)	(-5.43)	(-10.13)	(-12.84)	(-5.60)	(-2.41)	(-7.80)	(-11.00)
AIO (residual)	0.0275	0.0132	0.0221	0.0337	0.0117	0.0066	0.0159	0.0253
	(13.22)	(6.13)	(9.79)	(12.01)	(6.16)	(2.83)	(7.42)	(8.74)

Panel C.2. Fama-French monthly alphas by illiquidity group

	Equally-weighted				Value-weighted			
	All	Liquid	Medium	Illiquid	All	Liquid	Medium	Illiquid
AIO (level)	-0.0078	0.0024	-0.0172	-0.0101	-0.0062	-0.0029	-0.0106	-0.0099
	(-5.42)	(1.13)	(-7.77)	(-4.98)	(-3.32)	(-0.88)	(-4.76)	(-4.92)
AIO (slope)	-0.0282	-0.0121	-0.0269	-0.0339	-0.0100	-0.0055	-0.0172	-0.0277
	(-14.68)	(-6.21)	(-11.53)	(-13.64)	(-6.44)	(-2.56)	(-8.39)	(-11.57)
AIO (residual)	0.0279	0.0128	0.0223	0.0347	0.0121	0.0061	0.0164	0.0265
	(13.66)	(6.20)	(9.72)	(12.59)	(6.60)	(2.63)	(7.43)	(9.35)

Table IX. - *Continued*

Panel D. Abnormal ownership low-high portfolio returns by institution type

Panel D.1. Average monthly raw returns by institution type

	Equally-weighted portfolios					Value-weighted portfolios				
	All	Banks	Insurance	Mutual funds	Other	All	Banks	Insurance	Mutual funds	Other
AO (level)	-0.0090	-0.0056	-0.0044	-0.0100	-0.0070	-0.0089	-0.0079	-0.0063	-0.0075	-0.0048
	(-5.20)	(-2.73)	(-2.93)	(-6.02)	(-4.68)	(-3.79)	(-2.77)	(-2.86)	(-2.99)	(-2.51)
AO (slope)	-0.0273	-0.0152	-0.0113	-0.0265	-0.0189	-0.0105	-0.0094	-0.0037	-0.0120	-0.0047
	(-13.42)	(-9.65)	(-8.64)	(-12.59)	(-12.20)	(-5.60)	(-5.67)	(-2.76)	(-6.52)	(-2.11)
AO (residual)	0.0275	0.0139	0.0096	0.0240	0.0151	0.0117	0.0061	0.0030	0.0110	0.0053
	(13.22)	(10.50)	(9.69)	(11.86)	(14.29)	(6.16)	(4.24)	(2.07)	(6.12)	(3.56)

Panel D.2. Fama-French monthly alphas by institution type

	Equally-weighted portfolios					Value-weighted portfolios				
	All	Banks	Insurance	Mutual funds	Other	All	Banks	Insurance	Mutual funds	Other
AO (level)	-0.0090	-0.0056	-0.0044	-0.0100	-0.0070	-0.0089	-0.0079	-0.0063	-0.0075	-0.0048
	(-5.20)	(-2.73)	(-2.93)	(-6.02)	(-4.68)	(-3.79)	(-2.77)	(-2.86)	(-2.99)	(-2.51)
AO (slope)	-0.0273	-0.0152	-0.0113	-0.0265	-0.0189	-0.0105	-0.0094	-0.0037	-0.0120	-0.0047
	(-13.42)	(-9.65)	(-8.64)	(-12.59)	(-12.20)	(-5.60)	(-5.67)	(-2.76)	(-6.52)	(-2.11)
AO (residual)	0.0275	0.0139	0.0096	0.0240	0.0151	0.0117	0.0061	0.0030	0.0110	0.0053
	(13.22)	(10.50)	(9.69)	(11.86)	(14.29)	(6.16)	(4.24)	(2.07)	(6.12)	(3.56)

Table X. Institutional trading momentum Fama MacBeth results

The table below shows the estimated institutional trading momentum (ITM) parameters from a regression of annual returns on institutional trading momentum and other financial variables. The other financial variables are book-to-market ratio, firm size, institutional ownership, return momentum, mutual fund herding, and persistence. The Fama MacBeth regressions are run in June of each year from 1980 until 2010 using common shares (share codes of 10 and 11) with a share price between \$5 and \$1000. Financial firms and utilities are excluded from the regressions. Firms are classified as small, medium, or large using 30th and 70th percentile breakpoints. Separate regression models are estimated for institutional trading momentum calculated for windows ranging from 1 quarter to 20 quarters. All of the independent variables are standardized monthly to have a mean of 0 and standard deviation of 1. Below *t*-statistics are presented in parentheses. All parameters are estimated using Newey-West (1987) standard errors.

Panel A. All firms

	Q = 1	Q = 2	Q = 4	Q = 6	Q = 8	Q = 10	Q = 12	Q = 14	Q = 16	Q = 18	Q = 20
ITM	-0.0068	-0.0151	-0.0218	-0.0227	-0.0225	-0.0237	-0.0222	-0.0194	-0.0177	-0.0175	-0.0184
	(-2.98)	(-4.95)	(-3.96)	(-3.91)	(-4.44)	(-4.94)	(-4.62)	(-3.84)	(-3.85)	(-3.92)	(-3.34)
Avg adjrsq	0.0361	0.0366	0.0377	0.0390	0.0396	0.0397	0.0406	0.0353	0.0362	0.0363	0.0368

Panel B. Small size firms

	Q = 1	Q = 2	Q = 4	Q = 6	Q = 8	Q = 10	Q = 12	Q = 14	Q = 16	Q = 18	Q = 20
ITM	-0.0101	-0.0277	-0.0437	-0.0539	-0.0532	-0.0534	-0.0545	-0.0566	-0.0517	-0.0643	-0.0788
	(-1.32)	(-3.38)	(-3.17)	(-5.99)	(-5.87)	(-4.54)	(-3.67)	(-3.47)	(-2.63)	(-2.98)	(-3.17)
Avg adjrsq	0.0285	0.0302	0.0343	0.0361	0.0331	0.0308	0.0301	0.0263	0.0299	0.0319	0.0250

Panel C. Medium size firms

	Q = 1	Q = 2	Q = 4	Q = 6	Q = 8	Q = 10	Q = 12	Q = 14	Q = 16	Q = 18	Q = 20
ITM	-0.0057	-0.0153	-0.0211	-0.0238	-0.0208	-0.0201	-0.0196	-0.0173	-0.0161	-0.0168	-0.0173
	(-1.11)	(-2.14)	(-2.80)	(-2.61)	(-2.98)	(-4.31)	(-4.76)	(-3.78)	(-3.17)	(-4.16)	(-3.03)
Avg adjrsq	0.0410	0.0424	0.0429	0.0460	0.0464	0.0449	0.0462	0.0416	0.0419	0.0397	0.0392

Panel D. Large size firms

	Q = 1	Q = 2	Q = 4	Q = 6	Q = 8	Q = 10	Q = 12	Q = 14	Q = 16	Q = 18	Q = 20
ITM	0.0016	-0.0108	-0.0175	-0.0176	-0.0174	-0.0214	-0.0174	-0.0138	0.0009	-0.0016	0.0007
	(0.39)	(-2.08)	(-3.19)	(-3.44)	(-3.03)	(-3.49)	(-2.89)	(-2.21)	(0.07)	(-0.11)	(0.04)
Avg adjrsq	0.0631	0.0659	0.0636	0.0641	0.0651	0.0671	0.0670	0.0580	0.0592	0.0617	0.0629

Table XI. Institutional trading momentum decile portfolio characteristics

At the end of June of each year from 1980 to 2010 I allocate firms to ten decile portfolios based on institutional trading momentum. Institutional trading momentum is defined as the cumulative net trades over the prior Q quarters scaled by shares outstanding at the start of the period. Net trades is defined as total shares bought less total shares sold during a quarter. The table reports the time series average of annual medians at the time of portfolio formation for institutional trading momentum (Q = 10) and 12 other financial variables. The portfolio characteristics are calculated for common shares only with share codes equal to 10 and 11. At the time of formation, financial firms and utilities and securities with a share price less than $5 or greater than $1,000 are excluded.

Panel A. Institutional trading variables

Decile	ITM(10 qtrs)	AIO (level)	AIO (slope)	AIO (residual)	E[IO]	IO	MF Herding	Nagel RIO	Persis.	RIO
1(Low)	-0.1381	0.5007	-0.0015	-0.0398	0.5154	0.4482	0.0285	0.2821	-0.2143	-0.0536
2	-0.0507	0.4514	0.0007	-0.0166	0.4621	0.4282	0.0174	0.1631	-0.1429	-0.0247
3	-0.0121	0.3937	0.0016	-0.0089	0.4052	0.3768	0.0144	0.0672	0.0000	-0.0145
4	0.0160	0.4202	0.0026	-0.0047	0.4262	0.4095	0.0154	0.0814	0.0000	-0.0060
5	0.0416	0.4464	0.0035	-0.0002	0.4475	0.4407	0.0207	0.0943	0.1429	0.0015
6	0.0701	0.4793	0.0044	0.0035	0.4759	0.4750	0.0110	0.2130	0.0714	0.0111
7	0.1052	0.5110	0.0052	0.0103	0.4969	0.5207	0.0147	0.3583	0.1071	0.0224
8	0.1555	0.5290	0.0066	0.0173	0.5054	0.5406	0.0203	0.4537	0.2857	0.0398
9	0.2422	0.5367	0.0084	0.0301	0.5059	0.5699	0.0189	0.5691	0.4643	0.0613
10(High)	0.4900	0.5826	0.0120	0.0549	0.5344	0.6480	0.0196	0.7419	1.0357	0.1008
Spread(1-10)	-0.6281	-0.0819	-0.0135	-0.0947	-0.0190	-0.1998	0.0088	-0.4598	-1.2500	-0.1544
t (spread)	(-27.41)	(-5.61)	(-33.97)	(-35.17)	(-1.36)	(-11.90)	(2.21)	(-7.09)	(-6.35)	(-47.77)

Panel B. Other financial variables

Decile	Asset growth	BEME	Issuances	Firm size	Idio. Risk	Illiquidity	Market beta	Momentum	ROE
1(Low)	0.0300	0.7435	-0.0756	263.5418	2.0073	0.0626	1.0564	0.0950	0.0752
2	0.0474	0.6760	-0.0823	412.2156	1.8026	0.0738	0.9655	0.0977	0.0998
3	0.0550	0.6441	-0.0652	338.7922	1.8443	0.1123	0.9370	0.1089	0.1037
4	0.0634	0.5991	-0.0567	381.5804	1.8345	0.1079	0.9342	0.1119	0.1105
5	0.0696	0.5843	-0.0427	393.7922	1.7940	0.0886	0.9620	0.1151	0.1129
6	0.0754	0.5674	-0.0235	398.9377	1.8085	0.0752	1.0106	0.1135	0.1140
7	0.0872	0.5549	0.0079	417.0848	1.8350	0.0668	1.0563	0.1197	0.1162
8	0.1057	0.5225	0.0572	374.6996	1.9428	0.0521	1.1199	0.1197	0.1213
9	0.1374	0.4811	0.1472	379.1026	2.0718	0.0441	1.2348	0.1388	0.1242
10(High)	0.2545	0.4150	0.4393	445.4653	2.1938	0.0282	1.3654	0.1510	0.1261
Spread(1-10)	-0.2245	0.3284	-0.5149	-181.9235	-0.1865	0.0344	-0.3090	-0.0560	-0.0509
t (spread)	(-12.70)	(9.12)	(-22.54)	(-4.39)	(-3.72)	(4.25)	(-7.38)	(-1.77)	(-7.81)

Table XII. Correlation between institutional trading momentum variables and other trades variables

The table below shows the correlations between institutional trading momentum and other trades variables. Institutional trading momentum is defined as the cumulate net trades over the prior *Q* quarters scaled by shares outstanding at the start of the period. Net trades is calculated quarterly for each stock and is defined as the total shares bought less the total shares sold by financial institutions. Net trades and shares outstanding are adjusted for stock splits. Below, the correlations between institutional trading momentum for windows ranging from 1 quarter to 20 quarters presented in Panel A, while the correlations between institutional trading momentum and other trades variables is presented in Panel B. Abnormal institutional ownership is defined as the residual component of institutional ownership after removing the trend in ownership using the Hodrick-Prescott (1990) filter with λ=1600. First difference in institutional ownership is defined as the one quarter change in institutional ownership. Institutional ownership is defined as total shares held by financial institutions divided by shares outstanding. Mutual fund herding is the Lakonishok et al. (1992) herding measure calculated for mutual funds following Wermers (1999). Nagel residual ownership is the residual portion of institutional ownership after controlling for firm size as in Nagel (2005). Persistence is the Dasgupta et al (2011) institutional trading persistence measure that measures the total number of quarters a security was bought or sold over the prior 3 quarters.

Panel A. Correlations between institutional trading momentum for different window sizes

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	ITM(1 qtr)	1										
(2)	ITM(2 qtrs)	0.6196	1									
(3)	ITM(4 qtrs)	0.4122	0.6354	1								
(4)	ITM(6 qtrs)	0.3137	0.4931	0.7827	1							
(5)	ITM(8 qtrs)	0.2729	0.4185	0.6739	0.8680	1						
(6)	ITM(10 qtrs)	0.2102	0.3309	0.5352	0.6885	0.7883	1					
(7)	ITM(12 qtrs)	0.1800	0.3123	0.4738	0.6337	0.7168	0.9046	1				
(8)	ITM(14 qtrs)	0.1517	0.2724	0.4061	0.5357	0.6114	0.7631	0.8433	1			
(9)	ITM(16 qtrs)	0.0900	0.1286	0.2134	0.3105	0.3578	0.7583	0.7704	0.8062	1		
(10)	ITM(18 qtrs)	0.0864	0.1262	0.2013	0.2943	0.3420	0.7354	0.7582	0.7807	0.9549	1	
(11)	ITM(20 qtrs)	0.0620	0.0945	0.1478	0.1816	0.2230	0.5327	0.5507	0.8136	0.8172	0.8439	1

Panel B. Correlations between institutional trading momentum and other trading variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	ITM (10 qtrs)	1										
(2)	AIO (level)	0.1178	1									
(3)	AIO (slope)	0.2633	0.0121	1								
(4)	AIO (residual)	0.2680	0.0504	-0.0696	1							
(5)	E[IO]	0.0801	0.9762	0.0294	0.0101	1						
(6)	First dif inst. own.	0.0810	-0.0154	0.1928	0.3955	-0.0139	1					
(7)	Inst. own.	0.1782	0.9709	-0.0051	0.2880	0.9384	0.0798	1				
(8)	MF herding	0.0192	-0.0847	0.0186	-0.0404	-0.0715	0.0418	-0.0935	1			
(9)	Nagel RIO	0.1114	0.4258	-0.0499	0.2877	0.3928	0.0954	0.4782	-0.0552	1		
(10)	Persistence	0.1493	-0.0864	0.2550	0.2589	-0.0903	0.3023	-0.0203	0.0062	0.0503	1	
(11)	Residual IO	0.2928	0.1836	-0.0937	0.8061	0.0254	0.2702	0.3693	-0.0614	0.3217	0.1845	1

Table XIII. Institutional trading momentum decile portfolio results

At the end of June of each year from 1980 to 2010, stocks are allocated to deciles based on institutional trading momentum (ITM) defined as cumulative net trades over the prior *Q* quarters scaled by shares outstanding at the start of the period. Net trades is defined as total shares bought less total shares sold by financial institutions in a given quarter. Equally-weighted and value-weighted portfolios are formed in June of year t and held from July of year *t* until June of year *t*+1. The table presents average monthly raw returns and monthly Fama-French alphas for strategies constructed using institutional trading momentum calculated using between 1 and 20 quarters of net trades. The portfolios are formed using only common shares (share codes of 10 or 11) with a share price between \$5 and \$1,000. Financial firms and utilities are excluded (SIC codes 4900-4999 and 6000-6999). All returns are in decimal form. The *t*-statistics are adjusted for auto-correlation using Newey West (1987) standard errors.

Panel A. Raw portfolio returns by window size

Panel A.1 Equally-weighted portfolio average monthly returns

Window Size	Institutional trading momentum deciles										
(quarters)	Low (1)	2	3	4	5	6	7	8	9	10	Spread (1-10	t(spread)
1	0.0094	0.0105	0.0101	0.0109	0.0107	0.0103	0.0102	0.0094	0.0096	0.0079	0.0016	(1.06)
2	0.0110	0.0110	0.0115	0.0102	0.0108	0.0103	0.0104	0.0096	0.0097	0.0072	0.0038	(2.69)
4	0.0118	0.0114	0.0117	0.0111	0.0107	0.0107	0.0106	0.0107	0.0101	0.0066	0.0052	(3.73)
6	0.0133	0.0125	0.0121	0.0129	0.0117	0.0115	0.0120	0.0119	0.0109	0.0074	0.0059	(4.13)
8	0.0136	0.0129	0.0132	0.0119	0.0118	0.0121	0.0114	0.0120	0.0111	0.0075	0.0061	(4.07)
10	0.0125	0.0117	0.0106	0.0092	0.0104	0.0104	0.0107	0.0109	0.0093	0.0060	0.0065	(4.20)
12	0.0125	0.0115	0.0112	0.0099	0.0102	0.0105	0.0109	0.0103	0.0103	0.0063	0.0062	(4.08)
14	0.0125	0.0129	0.0108	0.0112	0.0109	0.0120	0.0108	0.0109	0.0110	0.0079	0.0047	(3.29)
16	0.0127	0.0130	0.0115	0.0106	0.0115	0.0117	0.0117	0.0106	0.0110	0.0084	0.0043	(3.04)
18	0.0126	0.0126	0.0120	0.0108	0.0112	0.0107	0.0118	0.0101	0.0111	0.0079	0.0047	(3.29)
20	0.0128	0.0130	0.0111	0.0112	0.0111	0.0112	0.0119	0.0105	0.0109	0.0079	0.0050	(3.26)

Panel A.2 Value-weighted portfolio average monthly returns

Window Size	Institutional trading momentum deciles										
(quarters)	Low (1)	2	3	4	5	6	7	8	9	10	Spread (1-10	t(spread)
1	0.0089	0.0098	0.0101	0.0097	0.0105	0.0112	0.0093	0.0087	0.0109	0.0072	0.0017	(0.95)
2	0.0093	0.0120	0.0090	0.0101	0.0099	0.0104	0.0109	0.0095	0.0094	0.0062	0.0031	(1.83)
4	0.0098	0.0102	0.0108	0.0099	0.0097	0.0112	0.0110	0.0104	0.0093	0.0067	0.0031	(1.64)
6	0.0127	0.0102	0.0105	0.0111	0.0107	0.0117	0.0109	0.0118	0.0109	0.0070	0.0057	(3.16)
8	0.0136	0.0106	0.0107	0.0105	0.0118	0.0104	0.0124	0.0103	0.0096	0.0073	0.0063	(3.06)
10	0.0136	0.0094	0.0101	0.0077	0.0108	0.0093	0.0104	0.0102	0.0084	0.0058	0.0078	(4.03)
12	0.0137	0.0087	0.0103	0.0103	0.0098	0.0099	0.0097	0.0095	0.0097	0.0052	0.0084	(4.01)
14	0.0118	0.0100	0.0105	0.0112	0.0097	0.0113	0.0109	0.0092	0.0091	0.0063	0.0055	(2.78)
16	0.0123	0.0103	0.0108	0.0098	0.0115	0.0112	0.0115	0.0087	0.0099	0.0067	0.0056	(2.93)
18	0.0110	0.0098	0.0103	0.0101	0.0107	0.0107	0.0116	0.0091	0.0092	0.0060	0.0051	(2.23)
20	0.0125	0.0101	0.0114	0.0095	0.0100	0.0108	0.0112	0.0096	0.0080	0.0063	0.0062	(2.56)

Table XIII. - *Continued*

Panel B. Fama-French (1993) alphas by window size

Panel B.1 Equally-weighted portfolio Fama-French monthly alphas

Window Size	Institutional trading momentum deciles											
(quarters)	Low (1)	2	3	4	5	6	7	8	9	10	Spread (1-10	t(spread)
1	-0.0022	-0.0007	-0.0010	0.0000	0.0001	-0.0006	-0.0007	-0.0019	-0.0017	-0.0027	0.0005	(0.49)
2	-0.0007	-0.0005	0.0005	-0.0006	-0.0001	-0.0006	-0.0003	-0.0014	-0.0015	-0.0036	0.0029	(2.68)
4	0.0000	0.0001	0.0007	0.0002	0.0000	-0.0002	-0.0005	-0.0004	-0.0008	-0.0044	0.0044	(3.90)
6	0.0007	0.0010	0.0004	0.0015	0.0003	-0.0003	0.0002	-0.0001	-0.0012	-0.0048	0.0055	(4.32)
8	0.0013	0.0012	0.0018	0.0008	0.0003	0.0006	-0.0005	-0.0001	-0.0013	-0.0048	0.0061	(4.61)
10	0.0018	0.0015	0.0007	-0.0007	0.0005	0.0001	0.0004	0.0005	-0.0011	-0.0044	0.0062	(4.65)
12	0.0018	0.0014	0.0013	0.0001	-0.0001	0.0001	0.0006	-0.0002	-0.0003	-0.0041	0.0059	(4.13)
14	0.0014	0.0023	0.0002	0.0008	0.0004	0.0011	-0.0002	-0.0003	-0.0005	-0.0036	0.0051	(3.79)
16	0.0018	0.0026	0.0014	-0.0001	0.0007	0.0012	0.0006	-0.0008	-0.0005	-0.0031	0.0049	(4.04)
18	0.0022	0.0029	0.0023	0.0007	0.0009	0.0005	0.0012	-0.0007	0.0001	-0.0032	0.0054	(4.65)
20	0.0025	0.0033	0.0014	0.0011	0.0011	0.0007	0.0013	-0.0003	-0.0001	-0.0032	0.0057	(4.67)

Panel B.2 Value-weighted portfolio Fama-French monthly alphas

Window Size	Institutional trading momentum deciles											
(quarters)	Low (1)	2	3	4	5	6	7	8	9	10	Spread (1-10	t(spread)
1	-0.0015	0.0011	0.0016	0.0011	0.0011	0.0017	0.0001	-0.0014	0.0005	-0.0026	0.0011	(0.72)
2	-0.0006	0.0017	-0.0001	0.0016	0.0006	0.0017	0.0015	-0.0004	-0.0007	-0.0034	0.0028	(1.76)
4	-0.0001	0.0002	0.0021	0.0011	0.0005	0.0021	0.0011	0.0011	-0.0006	-0.0035	0.0034	(1.91)
6	0.0020	0.0004	0.0007	0.0019	0.0010	0.0016	0.0006	0.0009	-0.0002	-0.0036	0.0056	(3.21)
8	0.0031	0.0007	0.0011	0.0011	0.0023	0.0004	0.0017	-0.0001	-0.0010	-0.0036	0.0066	(3.39)
10	0.0048	0.0009	0.0017	-0.0009	0.0023	0.0007	0.0015	0.0013	-0.0012	-0.0031	0.0079	(4.06)
12	0.0044	0.0002	0.0025	0.0012	0.0014	0.0008	0.0010	0.0001	-0.0004	-0.0036	0.0080	(3.73)
14	0.0023	0.0016	0.0017	0.0018	0.0004	0.0020	0.0012	-0.0011	-0.0012	-0.0035	0.0058	(2.72)
16	0.0028	0.0016	0.0019	0.0006	0.0022	0.0020	0.0018	-0.0016	-0.0001	-0.0033	0.0061	(3.05)
18	0.0026	0.0018	0.0017	0.0014	0.0019	0.0019	0.0022	-0.0005	-0.0004	-0.0035	0.0061	(2.58)
20	0.0045	0.0018	0.0029	0.0006	0.0015	0.0018	0.0016	0.0000	-0.0015	-0.0033	0.0078	(3.21)

Table XIV. Institutional trading momentum Low-High portfolio returns

Each June, common shares (share code equal to 10 or 11) with a share price between \$5 and \$1,000 are allocated to deciles based on institutional trading momentum, defined as cumulative net trades over the prior Q quarters scaled by shares outstanding at the start of the period. Equally-weighted and value-weighted portfolio returns are calculated from July of year t until June of year t+1. Financials and utilities (SIC Codes between 4900-4999 and 6000-6999) are exclude at the time of formation. The table shows the average monthly raw returns and monthly Fama-French alphas to institutional trading momentum Low-High (Decile 1-Decile 10) portfolios. The results for size, subperiod, and illiquidity subgroups are presented in Panels A, B, and C, respectively. Firms are allocated to size and illiquidity groups based on 30th and 70th percentile breakpoints. All returns are presented in decimal form. Below t-statistics are presented in parentheses and are adjusted for auto-correlation using Newey-West (1987) standard errors.

Panel A. Institutional trading momentum low-high portfolio returns by size group

Panel A.1. Average monthly raw return by size group

Window Size	Equally-weighted				Value-weighted			
(quarters)	All firms	Small	Medium	Large	All	Small	Medium	Large
1	0.0016	0.0015	-0.0005	0.0022	0.0017	0.0008	-0.0005	0.0022
	(1.06)	(1.01)	(-0.28)	(1.09)	(0.95)	(0.51)	(-0.28)	(1.04)
2	0.0038	0.0037	0.0041	0.0024	0.0031	0.0024	0.0042	0.0031
	(2.69)	(2.36)	(2.44)	(1.24)	(1.83)	(1.41)	(2.54)	(1.45)
4	0.0052	0.0053	0.0043	0.0055	0.0031	0.0039	0.0038	0.0027
	(3.73)	(3.65)	(2.32)	(2.58)	(1.64)	(2.94)	(2.00)	(1.14)
6	0.0059	0.0061	0.0042	0.0082	0.0057	0.0053	0.0036	0.0061
	(4.13)	(3.95)	(2.46)	(3.99)	(3.16)	(3.72)	(2.14)	(2.77)
8	0.0061	0.0062	0.0042	0.0070	0.0063	0.0050	0.0039	0.0066
	(4.07)	(3.82)	(2.47)	(3.42)	(3.06)	(3.31)	(2.18)	(2.71)
10	0.0065	0.0066	0.0046	0.0081	0.0078	0.0054	0.0042	0.0084
	(4.20)	(3.97)	(2.56)	(3.79)	(4.03)	(3.24)	(2.35)	(3.75)
12	0.0062	0.0067	0.0036	0.0079	0.0084	0.0054	0.0032	0.0096
	(4.08)	(3.83)	(2.00)	(3.99)	(4.01)	(3.10)	(1.76)	(3.85)
14	0.0047	0.0053	0.0026	0.0047	0.0055	0.0051	0.0026	0.0060
	(3.29)	(3.11)	(1.56)	(2.34)	(2.78)	(3.15)	(1.52)	(2.52)
16	0.0043	0.0049	0.0025	0.0037	0.0056	0.0046	0.0031	0.0059
	(3.04)	(3.21)	(1.29)	(1.92)	(2.93)	(3.16)	(1.63)	(2.67)
18	0.0047	0.0057	0.0029	0.0036	0.0051	0.0046	0.0035	0.0057
	(3.29)	(3.48)	(1.53)	(1.76)	(2.23)	(2.89)	(1.86)	(2.21)
20	0.0050	0.0067	0.0027	0.0047	0.0062	0.0064	0.0031	0.0072
	(3.26)	(3.87)	(1.35)	(2.50)	(2.56)	(3.79)	(1.58)	(2.63)

Table XIV. - *Continued*

Panel A.2. Fama-French monthly alphas by size group

Window Size	Equally-weighted				Value-weighted			
(quarters)	All firms	Small	Medium	Large	All firms	Small	Medium	Large
1	0.0005	0.0004	-0.0014	0.0011	0.0011	-0.0001	-0.0011	0.0013
	(0.49)	(0.30)	(-1.00)	(0.60)	(0.72)	(-0.05)	(-0.76)	(0.66)
2	0.0029	0.0027	0.0032	0.0015	0.0028	0.0012	0.0035	0.0025
	(2.68)	(2.15)	(2.41)	(0.78)	(1.76)	(0.86)	(2.68)	(1.20)
4	0.0044	0.0042	0.0037	0.0051	0.0034	0.0029	0.0034	0.0028
	(3.90)	(3.16)	(2.42)	(2.56)	(1.91)	(2.27)	(2.19)	(1.21)
6	0.0055	0.0059	0.0033	0.0081	0.0056	0.0049	0.0031	0.0059
	(4.32)	(3.88)	(2.04)	(3.82)	(3.21)	(3.61)	(1.99)	(2.64)
8	0.0061	0.0063	0.0038	0.0069	0.0066	0.0048	0.0039	0.0067
	(4.61)	(3.93)	(2.51)	(3.47)	(3.39)	(3.35)	(2.47)	(2.78)
10	0.0062	0.0064	0.0039	0.0076	0.0079	0.0048	0.0035	0.0083
	(4.65)	(4.09)	(2.36)	(3.60)	(4.06)	(3.21)	(2.19)	(3.64)
12	0.0059	0.0065	0.0027	0.0078	0.0080	0.0049	0.0024	0.0091
	(4.13)	(3.69)	(1.53)	(3.95)	(3.73)	(2.95)	(1.34)	(3.48)
14	0.0051	0.0057	0.0024	0.0049	0.0058	0.0053	0.0022	0.0061
	(3.79)	(3.29)	(1.39)	(2.39)	(2.72)	(3.25)	(1.27)	(2.40)
16	0.0049	0.0056	0.0022	0.0042	0.0061	0.0047	0.0029	0.0062
	(4.04)	(3.74)	(1.23)	(2.12)	(3.05)	(3.55)	(1.55)	(2.62)
18	0.0054	0.0065	0.0031	0.0039	0.0061	0.0050	0.0036	0.0064
	(4.65)	(4.04)	(1.89)	(1.78)	(2.58)	(3.38)	(2.14)	(2.34)
20	0.0057	0.0078	0.0027	0.0050	0.0078	0.0070	0.0032	0.0086
	(4.67)	(4.78)	(1.53)	(2.62)	(3.21)	(4.33)	(1.78)	(3.03)

Table XIV. - *Continued*

Panel B. Institutional trading momentum low-high portfolio returns by decade								
Panel B.1. Average monthly raw returns by decade								
Window Size	Equally-weighted				Value-weighted			
(quarters)	All years	80s	90s	00s	All years	80s	90s	00s
1	0.0016	-0.0001	-0.0011	0.0056	0.0017	0.0009	-0.0033	0.0068
	(1.06)	(-0.05)	(-0.47)	(1.82)	(0.95)	(0.41)	(-1.40)	(1.80)
2	0.0038	0.0026	0.0018	0.0065	0.0031	0.0028	0.0002	0.0050
	(2.69)	(1.69)	(0.68)	(2.36)	(1.83)	(1.13)	(0.06)	(2.08)
4	0.0052	0.0028	0.0039	0.0082	0.0031	0.0024	0.0003	0.0051
	(3.73)	(1.65)	(1.79)	(2.76)	(1.64)	(0.79)	(0.07)	(1.62)
6	0.0059	0.0039	0.0043	0.0088	0.0057	0.0059	0.0050	0.0059
	(4.13)	(1.83)	(2.28)	(2.95)	(3.16)	(1.52)	(1.52)	(2.13)
8	0.0061	0.0051	0.0053	0.0078	0.0063	0.0056	0.0045	0.0079
	(4.07)	(2.39)	(2.87)	(2.36)	(3.06)	(1.37)	(1.35)	(2.21)
10	0.0065	0.0058	0.0056	0.0080	0.0078	0.0104	0.0059	0.0080
	(4.20)	(2.52)	(2.68)	(2.50)	(4.03)	(2.77)	(1.77)	(2.50)
12	0.0062	0.0041	0.0066	0.0074	0.0084	0.0082	0.0084	0.0090
	(4.08)	(1.81)	(3.21)	(2.33)	(4.01)	(2.10)	(2.23)	(2.64)
14	0.0047	0.0014	0.0054	0.0058	0.0055	0.0011	0.0068	0.0065
	(3.29)	(0.68)	(2.87)	(2.01)	(2.78)	(0.54)	(1.74)	(2.17)
16	0.0043	0.0034	0.0034	0.0056	0.0056	0.0057	0.0046	0.0059
	(3.04)	(1.84)	(1.66)	(1.98)	(2.93)	(2.08)	(1.35)	(1.82)
18	0.0047	0.0028	0.0032	0.0068	0.0051	0.0044	0.0046	0.0054
	(3.29)	(1.19)	(1.84)	(2.40)	(2.23)	(1.25)	(1.36)	(1.27)
20	0.0050	0.0030	0.0040	0.0066	0.0062	0.0049	0.0070	0.0051
	(3.26)	(1.04)	(2.10)	(2.24)	(2.56)	(1.28)	(2.02)	(1.14)

Table XIV. - *Continued*

Panel B.2. Fama-French monthly alphas by decade

Window Size	Equally-weighted				Value-weighted			
(quarters)	All years	80s	90s	00s	All years	80s	90s	00s
1	0.0005	-0.0021	-0.0005	0.0024	0.0011	-0.0006	-0.0034	0.0042
	(0.49)	(-1.48)	(-0.24)	(1.17)	(0.72)	(-0.25)	(-1.63)	(1.44)
2	0.0029	0.0004	0.0029	0.0028	0.0028	0.0013	0.0001	0.0035
	(2.68)	(0.24)	(1.53)	(1.70)	(1.76)	(0.56)	(0.03)	(1.70)
4	0.0044	-0.0005	0.0051	0.0039	0.0034	-0.0011	0.0017	0.0040
	(3.90)	(-0.36)	(2.84)	(2.20)	(1.91)	(-0.45)	(0.49)	(1.46)
6	0.0055	0.0009	0.0051	0.0047	0.0056	0.0026	0.0063	0.0037
	(4.32)	(0.53)	(3.09)	(2.57)	(3.21)	(0.88)	(1.84)	(1.64)
8	0.0061	0.0023	0.0069	0.0040	0.0066	0.0021	0.0059	0.0067
	(4.61)	(1.33)	(4.10)	(1.96)	(3.39)	(0.70)	(1.64)	(2.09)
10	0.0062	0.0023	0.0075	0.0047	0.0079	0.0048	0.0077	0.0073
	(4.65)	(1.21)	(4.25)	(2.34)	(4.06)	(1.39)	(2.21)	(2.37)
12	0.0059	0.0002	0.0088	0.0036	0.0080	0.0027	0.0102	0.0054
	(4.13)	(0.12)	(5.15)	(1.63)	(3.73)	(0.83)	(2.50)	(2.12)
14	0.0051	-0.0006	0.0076	0.0028	0.0058	-0.0009	0.0086	0.0045
	(3.79)	(-0.32)	(4.58)	(1.34)	(2.72)	(-0.37)	(2.00)	(1.53)
16	0.0049	0.0017	0.0057	0.0033	0.0061	0.0031	0.0065	0.0040
	(4.04)	(0.92)	(3.76)	(1.53)	(3.05)	(1.25)	(1.83)	(1.21)
18	0.0054	0.0020	0.0055	0.0043	0.0061	0.0026	0.0059	0.0056
	(4.65)	(0.95)	(3.84)	(2.14)	(2.58)	(0.92)	(1.62)	(1.27)
20	0.0057	0.0012	0.0062	0.0043	0.0078	0.0034	0.0081	0.0064
	(4.67)	(0.48)	(4.43)	(2.14)	(3.21)	(1.21)	(2.16)	(1.54)

Table XIV. - *Continued*

Panel C. Institutional trading momentum low-high portfolio returns by illiquidity group

Panel C.1. Average monthly raw returns by illiquidity group

Window Size	Equally-weighted				Value-weighted			
(quarters)	All securities	Liquid	Medium	Illiquid	All securities	Liquid	Medium	Illiquid
1	0.0016	0.0032	-0.0017	0.0019	0.0017	0.0024	-0.0017	0.0015
	(1.06)	(1.48)	(-0.97)	(1.24)	(0.95)	(1.12)	(-1.03)	(0.91)
2	0.0038	0.0060	0.0010	0.0042	0.0031	0.0038	0.0012	0.0034
	(2.69)	(3.15)	(0.60)	(2.67)	(1.83)	(1.82)	(0.76)	(2.02)
4	0.0052	0.0083	0.0027	0.0052	0.0031	0.0035	0.0016	0.0042
	(3.73)	(3.85)	(1.66)	(3.61)	(1.64)	(1.54)	(0.92)	(2.84)
6	0.0059	0.0071	0.0044	0.0056	0.0057	0.0064	0.0032	0.0041
	(4.13)	(3.44)	(2.94)	(3.22)	(3.16)	(3.00)	(1.98)	(2.26)
8	0.0061	0.0081	0.0040	0.0062	0.0063	0.0070	0.0029	0.0046
	(4.07)	(3.85)	(2.57)	(3.34)	(3.06)	(2.99)	(1.60)	(2.42)
10	0.0065	0.0077	0.0052	0.0062	0.0078	0.0082	0.0049	0.0050
	(4.20)	(3.57)	(3.17)	(3.55)	(4.03)	(3.71)	(2.75)	(2.61)
12	0.0062	0.0077	0.0041	0.0067	0.0084	0.0095	0.0042	0.0045
	(4.08)	(3.45)	(2.52)	(3.69)	(4.01)	(3.78)	(2.33)	(2.47)
14	0.0047	0.0050	0.0045	0.0040	0.0055	0.0059	0.0036	0.0023
	(3.29)	(2.23)	(2.91)	(2.22)	(2.78)	(2.49)	(2.23)	(1.24)
16	0.0043	0.0040	0.0041	0.0034	0.0056	0.0058	0.0036	0.0018
	(3.04)	(1.97)	(2.45)	(2.14)	(2.93)	(2.70)	(1.97)	(0.98)
18	0.0047	0.0038	0.0047	0.0048	0.0051	0.0055	0.0043	0.0026
	(3.29)	(1.77)	(2.89)	(2.76)	(2.23)	(2.16)	(2.51)	(1.33)
20	0.0050	0.0037	0.0050	0.0055	0.0062	0.0069	0.0037	0.0041
	(3.26)	(1.71)	(2.73)	(3.27)	(2.56)	(2.54)	(1.97)	(2.18)

Table XIV. - *Continued*

Panel C.2. Fama-French monthly alphas by illiquidity group

Window Size	Equally-weighted				Value-weighted			
(quarters)	All securities	Liquid	Medium	Illiquid	All securities	Liquid	Medium	Illiquid
1	0.0005	0.0018	-0.0024	0.0009	0.0011	0.0014	-0.0022	0.0008
	(0.49)	(0.93)	(-1.52)	(0.65)	(0.72)	(0.76)	(-1.54)	(0.54)
2	0.0029	0.0054	0.0000	0.0034	0.0028	0.0033	0.0005	0.0028
	(2.68)	(2.85)	(-0.01)	(2.41)	(1.76)	(1.62)	(0.37)	(1.81)
4	0.0044	0.0079	0.0022	0.0042	0.0034	0.0036	0.0016	0.0034
	(3.90)	(4.14)	(1.43)	(3.06)	(1.91)	(1.60)	(1.07)	(2.46)
6	0.0055	0.0069	0.0039	0.0053	0.0056	0.0060	0.0032	0.0039
	(4.32)	(3.76)	(2.59)	(2.90)	(3.21)	(2.83)	(2.22)	(2.09)
8	0.0061	0.0082	0.0038	0.0062	0.0066	0.0071	0.0033	0.0047
	(4.61)	(4.44)	(2.62)	(3.31)	(3.39)	(3.04)	(2.16)	(2.44)
10	0.0062	0.0069	0.0048	0.0060	0.0079	0.0080	0.0047	0.0048
	(4.65)	(3.48)	(3.10)	(3.53)	(4.06)	(3.54)	(2.95)	(2.65)
12	0.0059	0.0072	0.0037	0.0064	0.0080	0.0088	0.0040	0.0044
	(4.13)	(3.42)	(2.19)	(3.59)	(3.73)	(3.37)	(2.34)	(2.50)
14	0.0051	0.0052	0.0044	0.0045	0.0058	0.0059	0.0036	0.0030
	(3.79)	(2.53)	(2.67)	(2.43)	(2.72)	(2.33)	(2.18)	(1.58)
16	0.0049	0.0045	0.0041	0.0041	0.0061	0.0060	0.0040	0.0024
	(4.04)	(2.36)	(2.48)	(2.65)	(3.05)	(2.57)	(2.32)	(1.35)
18	0.0054	0.0042	0.0051	0.0055	0.0061	0.0062	0.0049	0.0033
	(4.65)	(2.19)	(3.27)	(3.19)	(2.58)	(2.29)	(3.08)	(1.77)
20	0.0057	0.0041	0.0053	0.0063	0.0078	0.0082	0.0043	0.0051
	(4.67)	(2.19)	(3.08)	(3.91)	(3.21)	(2.93)	(2.47)	(2.81)

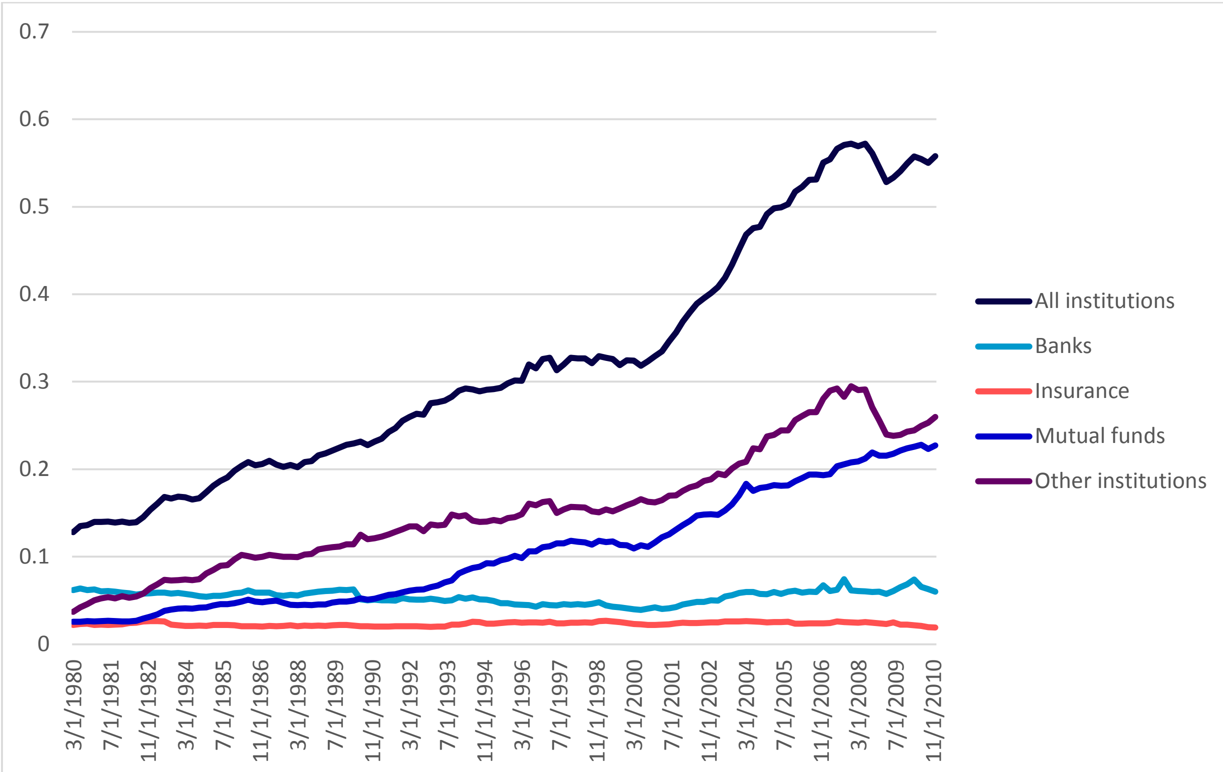
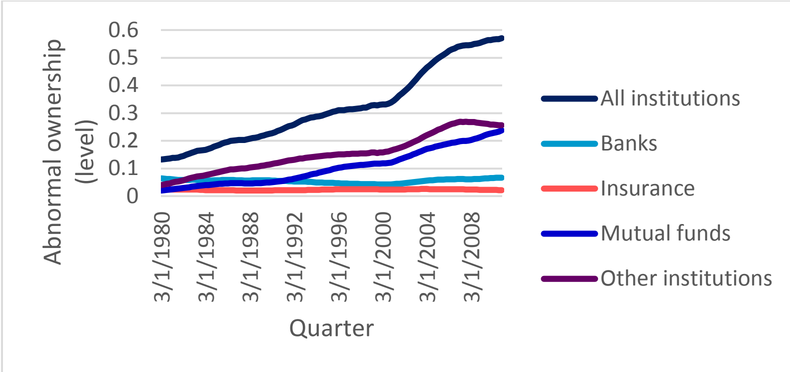


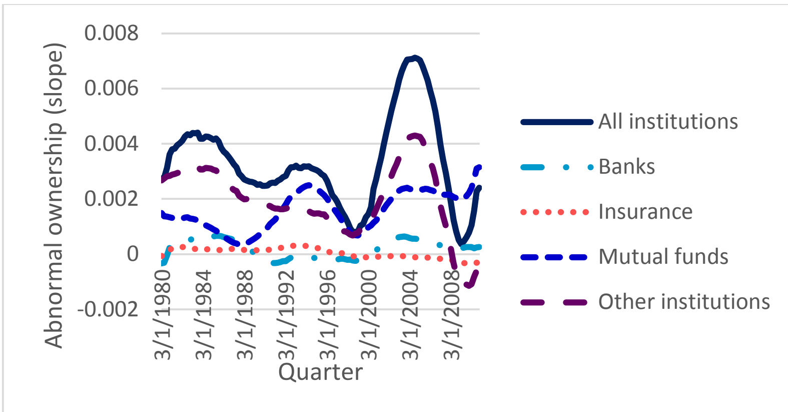
Figure 1. Times series of equally-weighted institutional ownership

The figure plots the time series of institutional ownership, bank ownership, insurance ownership, mutual fund ownership, and other institutions ownership for all common equity securities traded on the NYSE/NASDAQ/AMEX exchanges with share codes equal to 10 and 11. Institutional ownership is defined as the fraction of securities held by all financial institutions while bank, insurance, mutual fund, and other institutions ownership is the fraction of securities held by that type of institution. Institutions are classified using the methodology used in Lewellen (2011). Mutual fund ownership is from the Thomson Reuters mutual fund holdings database. All other ownership measures are calculated using data from the Thomson Reuters institutional holdings database. Ownership variables are calculated for the whole market by equally-weighting all securities.

Panel A: Abnormal institutional ownership (level)



Panel B: Abnormal institutional ownership (slope)



Panel C: Abnormal institutional ownership (residual)

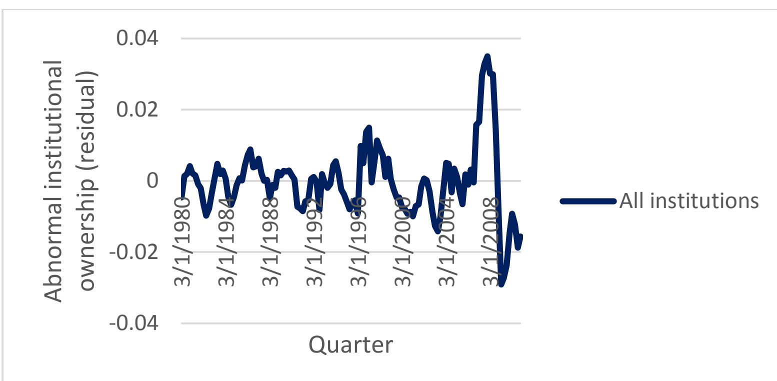
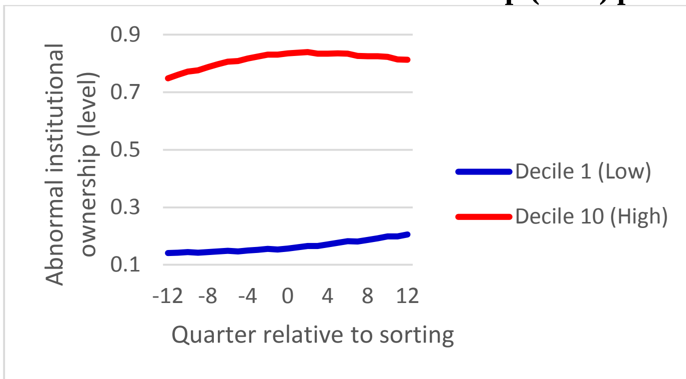


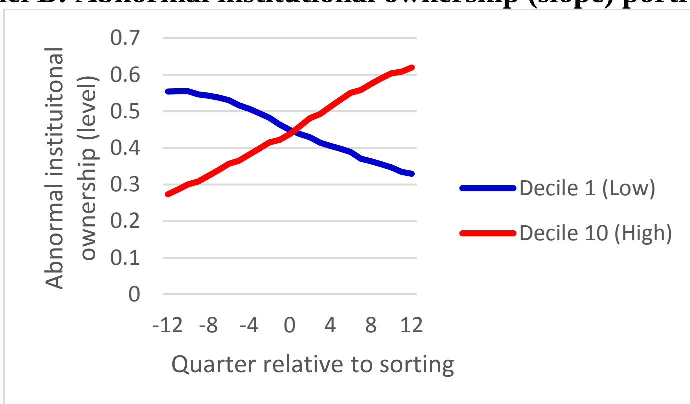
Figure 2. Times series of equally-weighted abnormal institutional ownership

The figure plots the time series of abnormal institutional ownership (level, slope, and residual components) for all common equity securities traded in the U.S. (share codes equal to 10 and 11). I calculate abnormal institutional ownership by de-trending institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. Institutional ownership is defined as the fraction of shares outstanding held by financial institutions. Abnormal institutional ownership for the whole market is calculated each quarter by equally-weighting each firm.

Panel A: Abnormal institutional ownership (level) portfolios



Panel B: Abnormal institutional ownership (slope) portfolios



Panel C: Abnormal institutional ownership (residual) portfolios

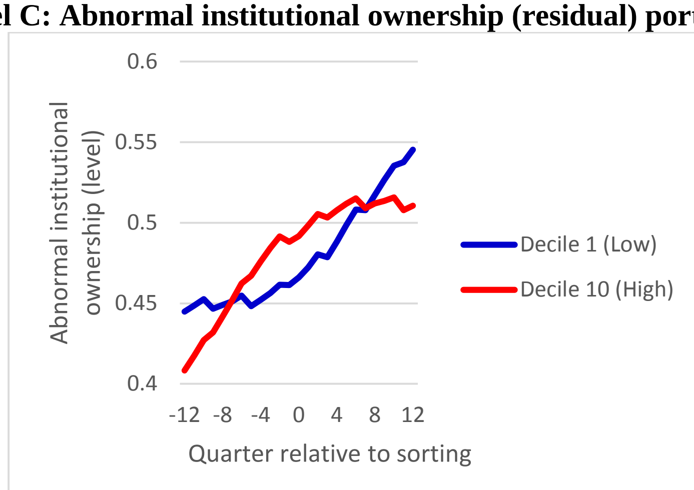
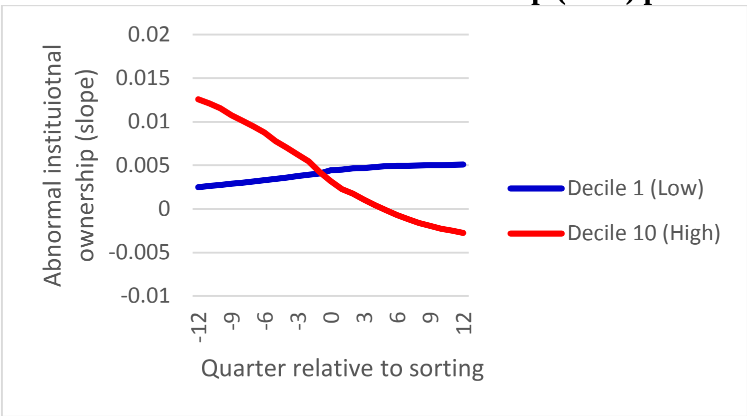


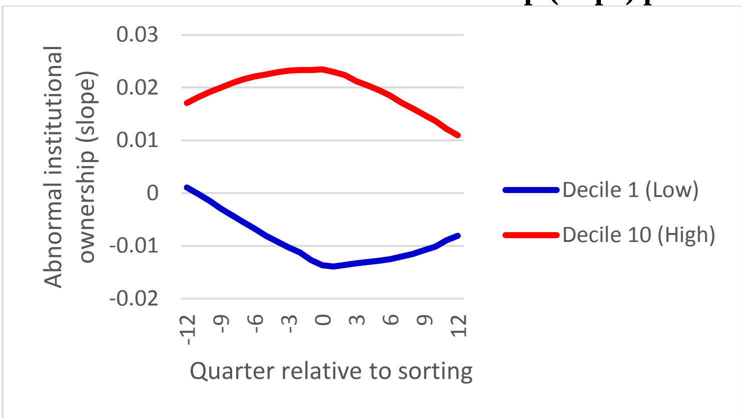
Figure 3. Mean abnormal institutional ownership (level) in event time

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted level of abnormal institutional ownership for the high and low abnormal institutional ownership portfolios for the 12 quarters around the formation date.

Panel A: Abnormal institutional ownership (level) portfolios



Panel B: Abnormal institutional ownership (slope) portfolios



Panel C: Abnormal institutional ownership (residual) portfolios

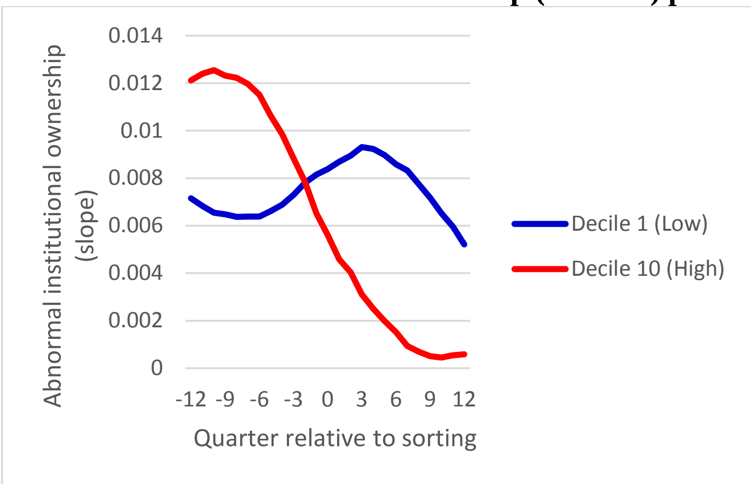
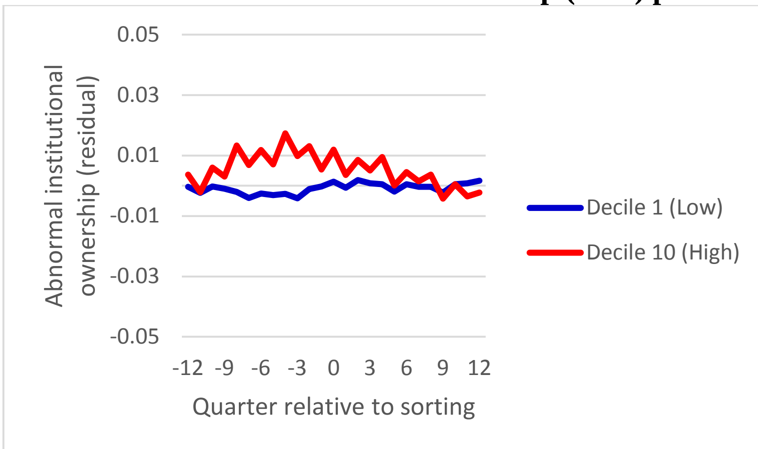


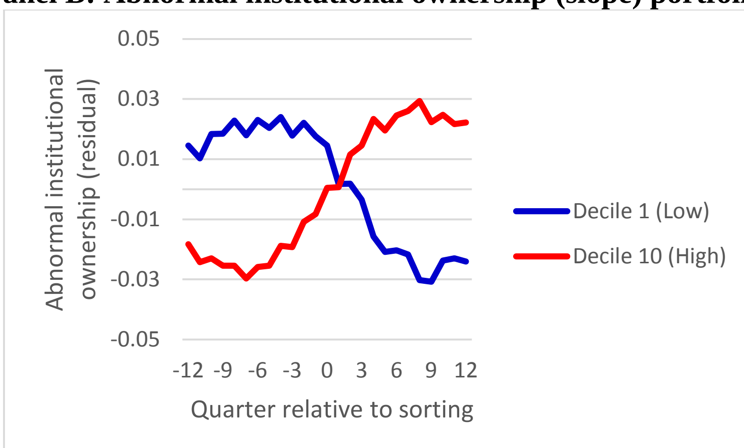
Figure 4. Mean abnormal institutional ownership (slope) in event time

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted slope of abnormal institutional ownership for the high and low abnormal institutional ownership portfolios for the 12 quarters around the formation date.

Panel A: Abnormal institutional ownership (level) portfolios



Panel B: Abnormal institutional ownership (slope) portfolios



Panel C: Abnormal institutional ownership (residual) portfolios

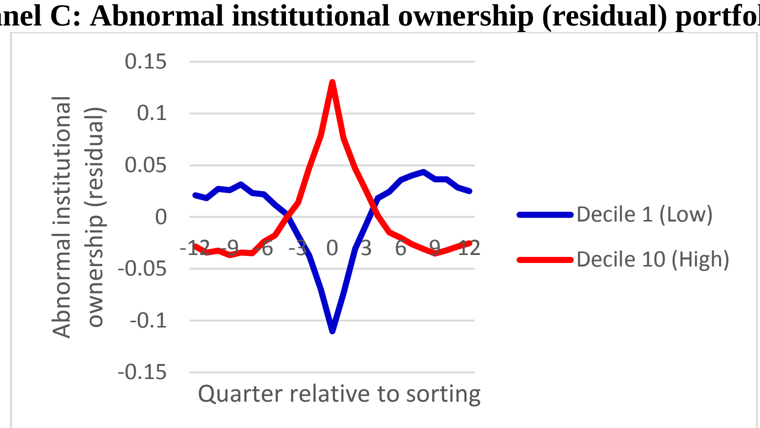
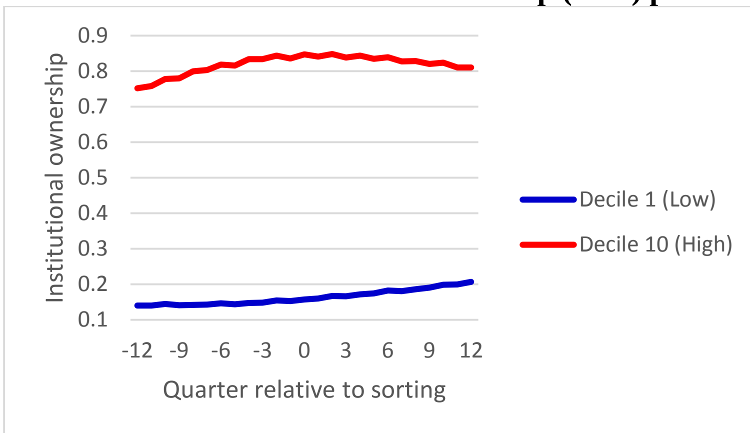


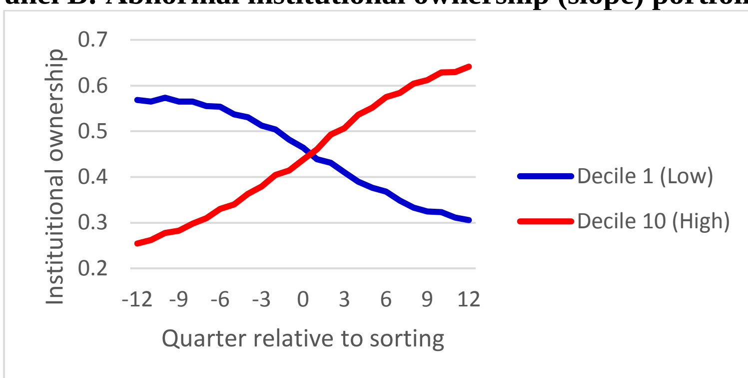
Figure 5. Mean abnormal institutional ownership (residual) in event time

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted level of abnormal institutional ownership for the low and high abnormal institutional ownership portfolios for the 12 quarters around the formation date.

Panel A: Abnormal institutional ownership (level) portfolios



Panel B: Abnormal institutional ownership (slope) portfolios



Panel C: Abnormal institutional ownership (residual) portfolios

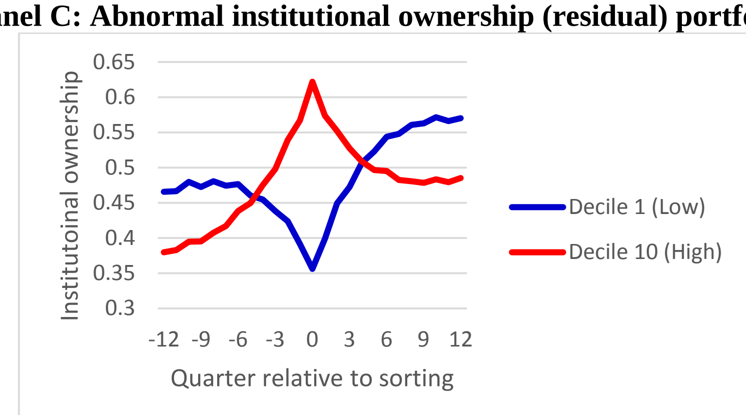
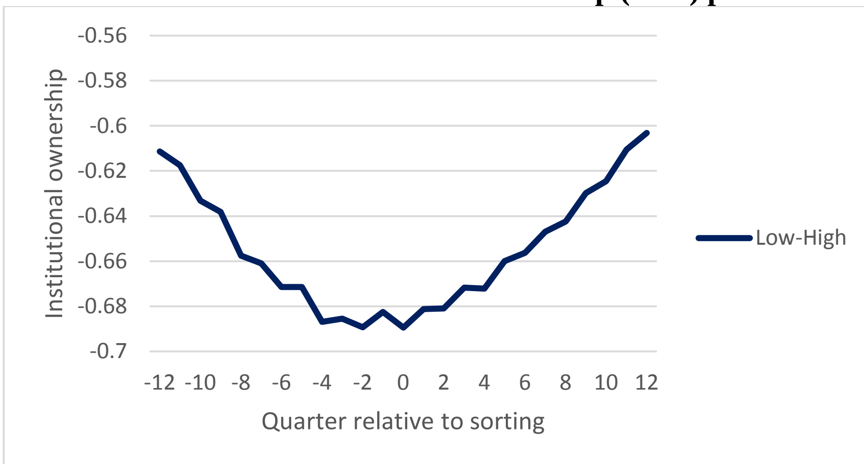


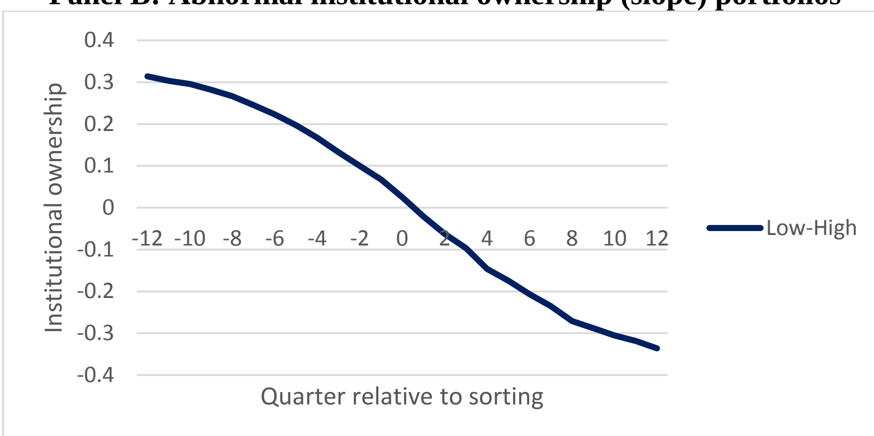
Figure 6. Mean institutional ownership in event time

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted level of institutional ownership for the low and high abnormal institutional ownership portfolios for the 12 quarters around the formation date.

Panel A: Abnormal institutional ownership (level) portfolios



Panel B: Abnormal institutional ownership (slope) portfolios



Panel C: Abnormal institutional ownership (residual) portfolios

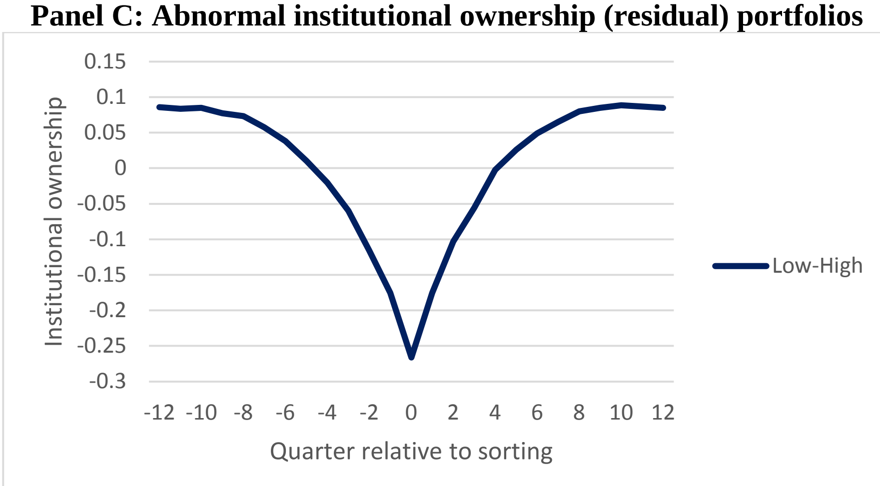
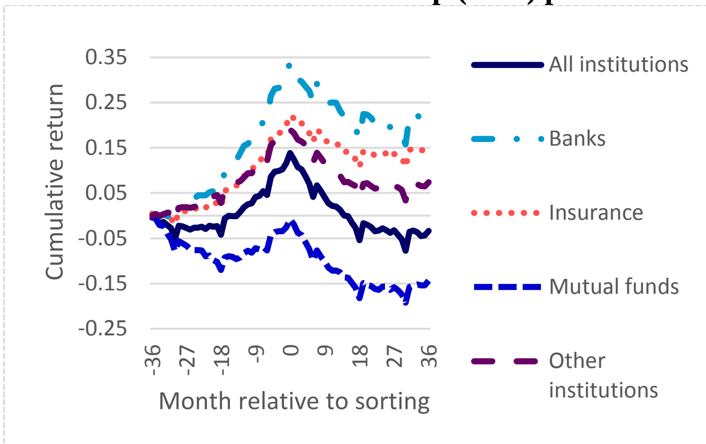


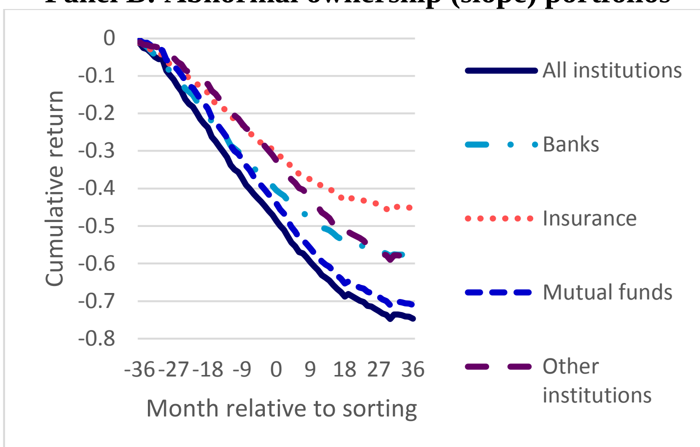
Figure 7. Mean difference in institutional ownership in event time

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted difference in institutional ownership for the Low minus High abnormal institutional ownership portfolios for the 12 quarters around the formation date.

Panel A: Abnormal ownership (level) portfolios



Panel B: Abnormal ownership (slope) portfolios



Panel C: Abnormal ownership (residual) portfolios

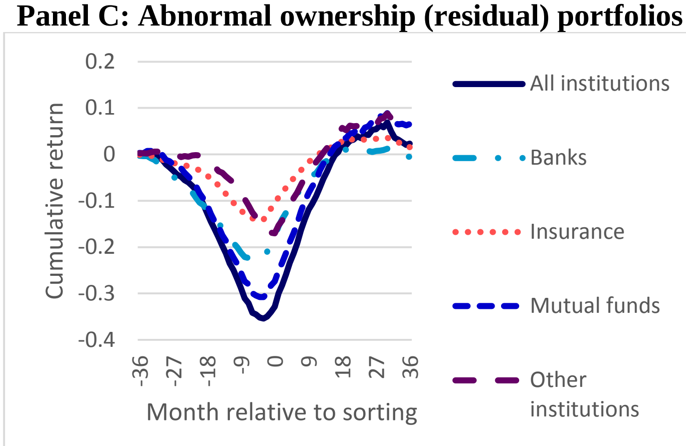
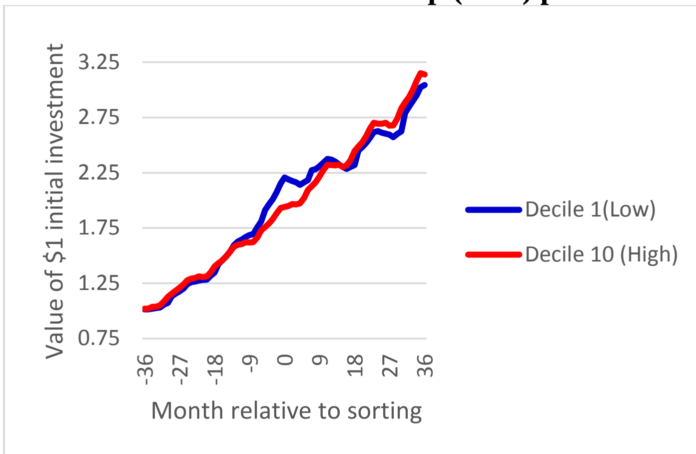


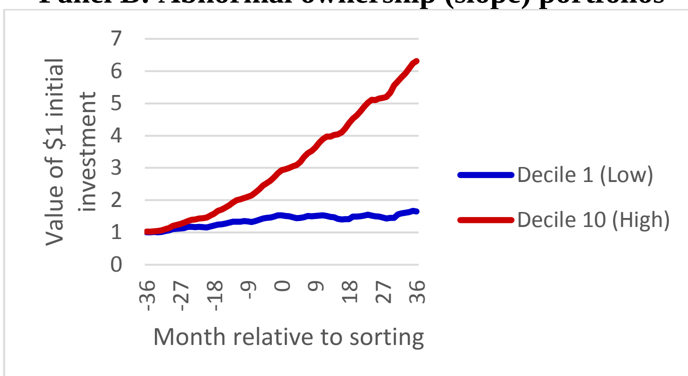
Figure 8. Cumulative return for abnormal ownership strategies in event time

Each June, firms are sorted on abnormal ownership and allocated to one of 10 decile portfolios using NYSE breakpoints. At the time of formation I exclude financials (SIC Codes 6000-6999), utilities (SIC Codes 4900-4999), and stocks with share prices less than \$5 or greater than \$1,000. This figure plots the cross-sectional cumulative average return of the Low-High portfolio for strategies formed using abnormal bank ownership, abnormal institutional ownership, abnormal insurance ownership, abnormal mutual fund ownership, and abnormal other ownership. Institution type is determined following the methodology of Lewellen (2011).

Panel A: Abnormal ownership (level) portfolios



Panel B: Abnormal ownership (slope) portfolios



Panel C: Abnormal ownership (residual) portfolios

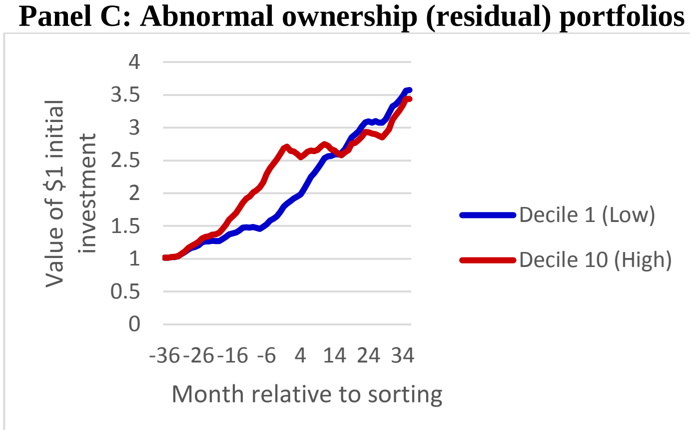


Figure 9. Value of $1 investment in abnormal institutional ownership portfolios in event time

Each June, firms are sorted on abnormal institutional ownership and allocated to one of 10 decile portfolios using NYSE breakpoints. At the time of formation I exclude financials (SIC Codes 6000-6999), utilities (SIC Codes 4900-4999), and stocks with share prices less than $5 or greater than $1,000. This figure plots the value of a $1 investment in the low and high decile portfolios for the 36 months surrounding the formation of the low-high abnormal institutional ownership portfolio.

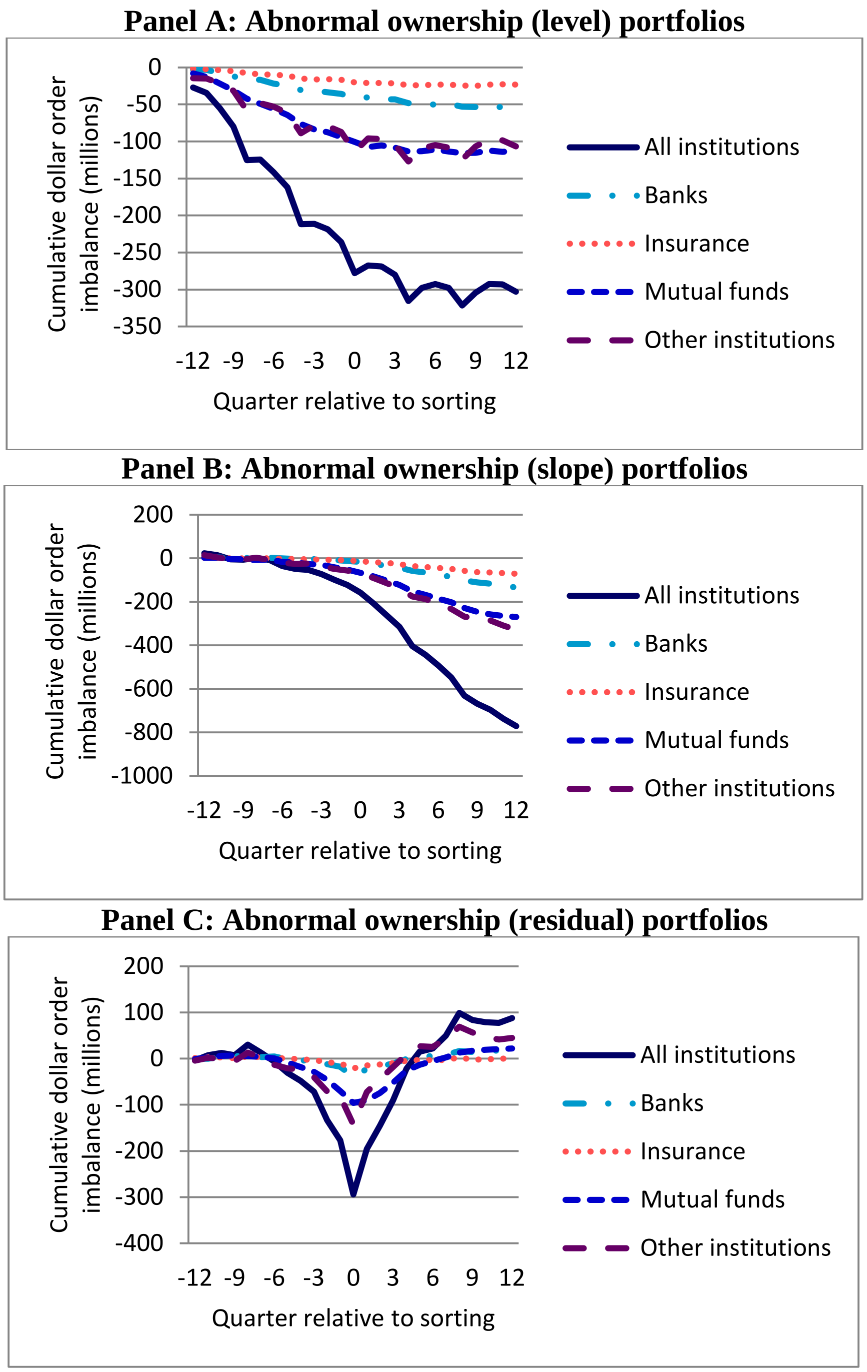
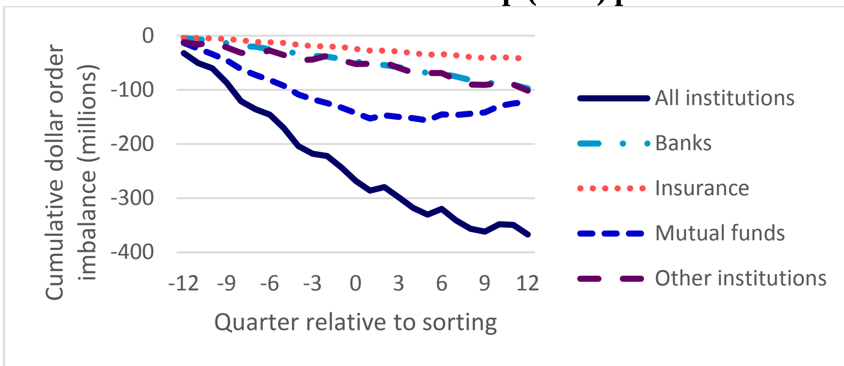


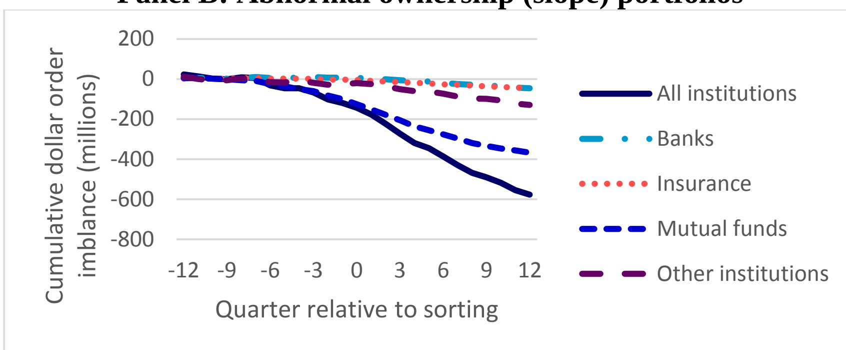
Figure 10. Cumulative dollar order imbalance in event time for abnormal institutional ownership strategies

This figure plots the cumulative average dollar net order imbalance for the 12 quarters surrounding the formation of the low-high abnormal institutional ownership portfolios. For each quarter, I calculate the net dollar change in shares held by financial institutions for the low and high abnormal institutional ownership portfolios. Dollar change in shares held is defined as the average price over the quarter multiplied by the change in shares held. Dollar Order imbalance is then defined as the difference in the net dollar change in shares between the low and high abnormal institutional ownership portfolios.

Panel A: Abnormal ownership (level) portfolios



Panel B: Abnormal ownership (slope) portfolios



Panel C: Abnormal ownership (residual) portfolios

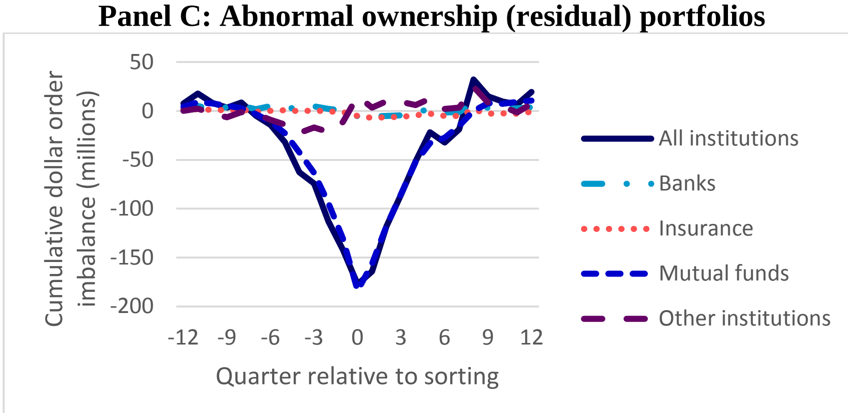
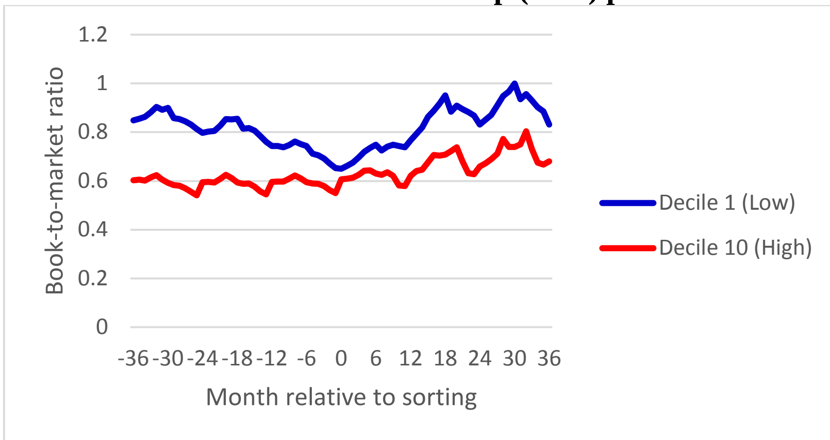


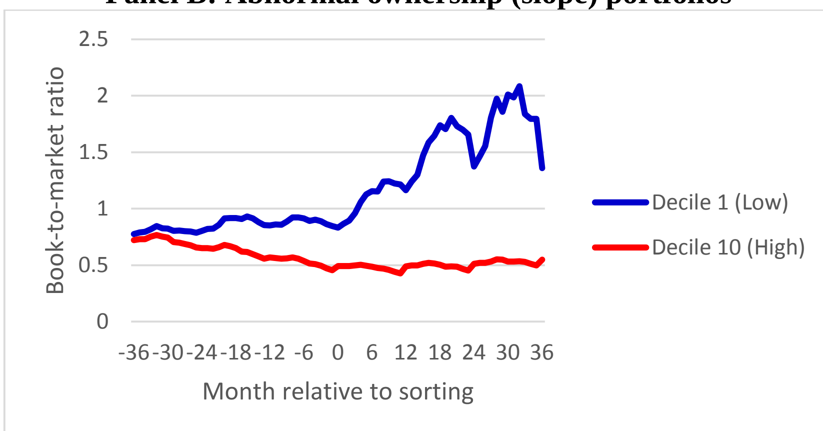
Figure 11. Cumulative dollar order imbalance by institution type in event time for abnormal mutual fund ownership strategies

This figure plots the cumulative average dollar net order imbalance for the 12 quarters surrounding the formation of the low-high abnormal institutional ownership portfolios. For each quarter, I calculate the net dollar change in shares held by financial institutions for the low and high abnormal institutional ownership portfolios. Dollar change in shares held is defined as the average price over the quarter multiplied by the change in shares held. Dollar Order imbalance is then defined as the difference in the net dollar change in shares between the low and high abnormal institutional ownership portfolios.

Panel A: Abnormal ownership (level) portfolios



Panel B: Abnormal ownership (slope) portfolios



Panel C: Abnormal ownership (residual) portfolios

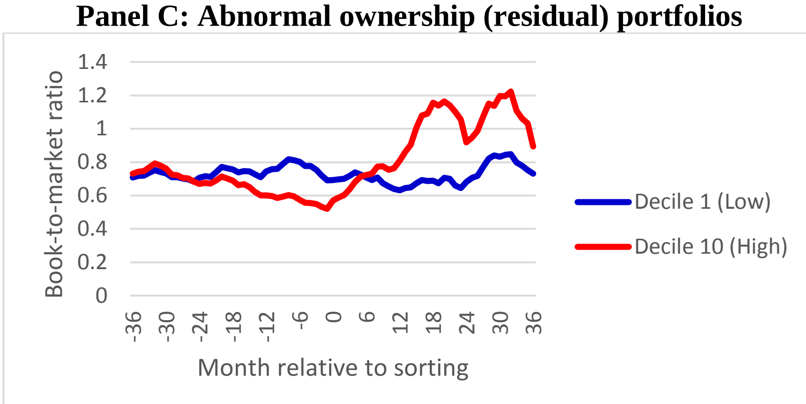
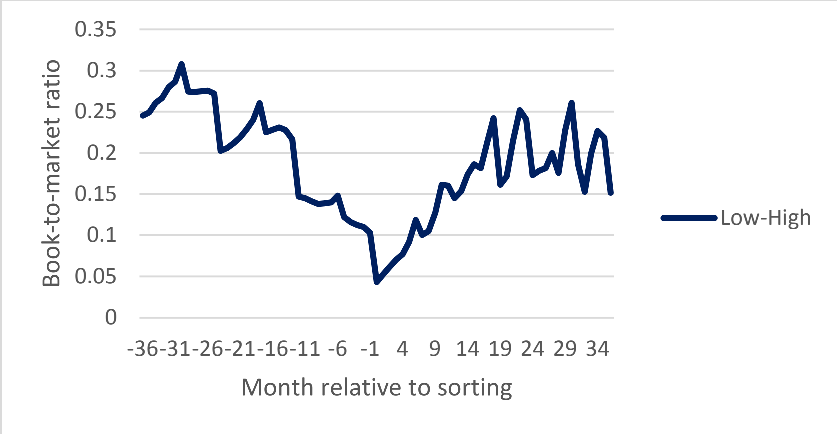


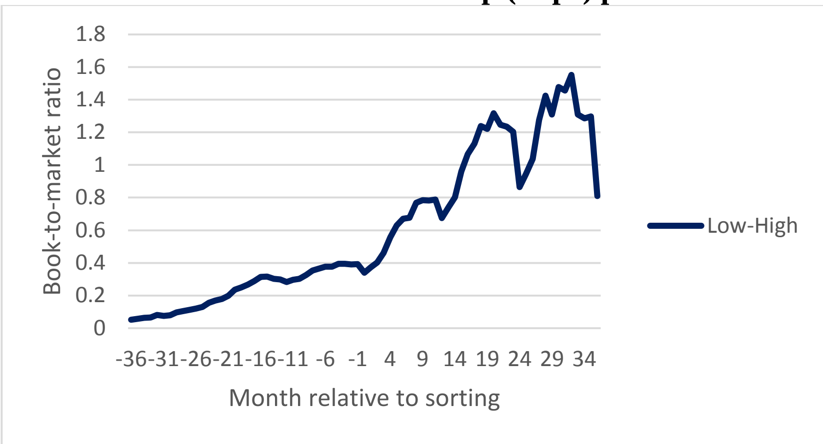
Figure 12. Mean book-to-market ratio in event time for low and high abnormal institutional ownership portfolios

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted book-to-market ratio for the low and high abnormal institutional ownership portfolios for the 36 months around the formation date.

Panel A: Abnormal ownership (level) portfolios



Panel B: Abnormal ownership (slope) portfolios



Panel C: Abnormal ownership (residual) portfolios

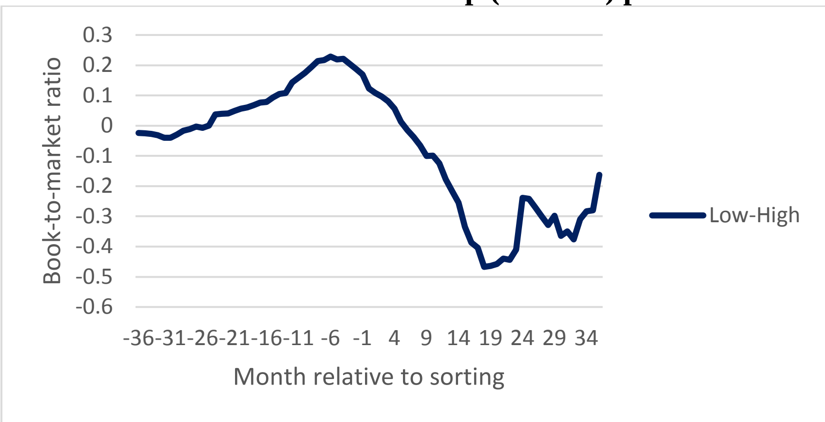


Figure 13 Mean book-to-market ratio in event time for low minus high abnormal institutional ownership portfolios

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on abnormal institutional ownership. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600. The table plots the equally-weighted book-to-market ratio for the low minus high abnormal institutional ownership portfolios for the 36 months around the formation date.

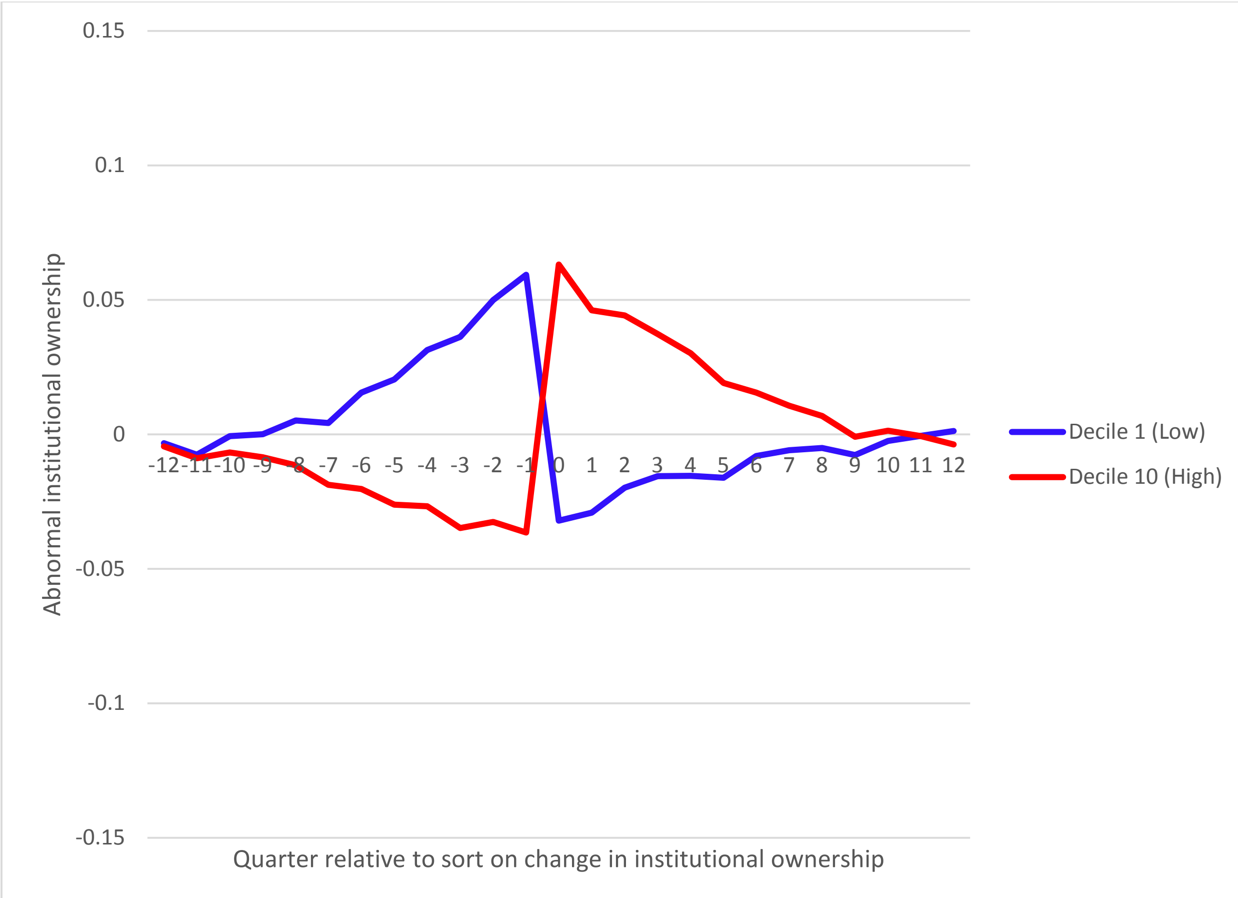


Figure 14. Mean abnormal institutional ownership in event time for change in institutional ownership portfolios

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on the quarterly change in institutional ownership. The table plots the equally-weighted level of abnormal institutional ownership for each of the ten decile portfolios for the 12 quarters around the formation date. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600.

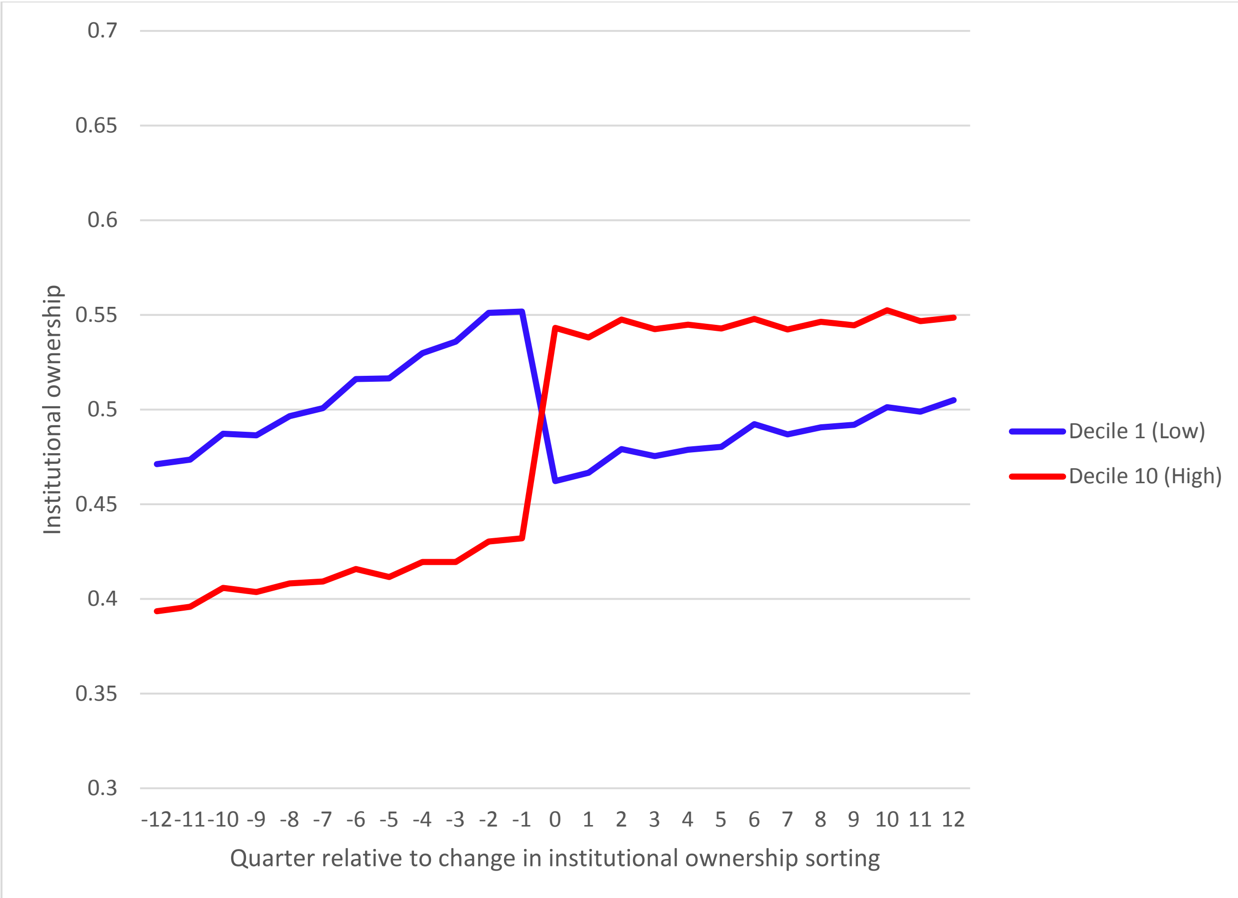


Figure 15. Mean institutional ownership in event time for change in institutional ownership portfolios

Each June from 1980 to 2010, firms are sorted into ten decile portfolios on the quarterly change in institutional ownership. The table plots the equally-weighted level of institutional ownership for each of the ten decile portfolios for the 12 quarters around the formation date.

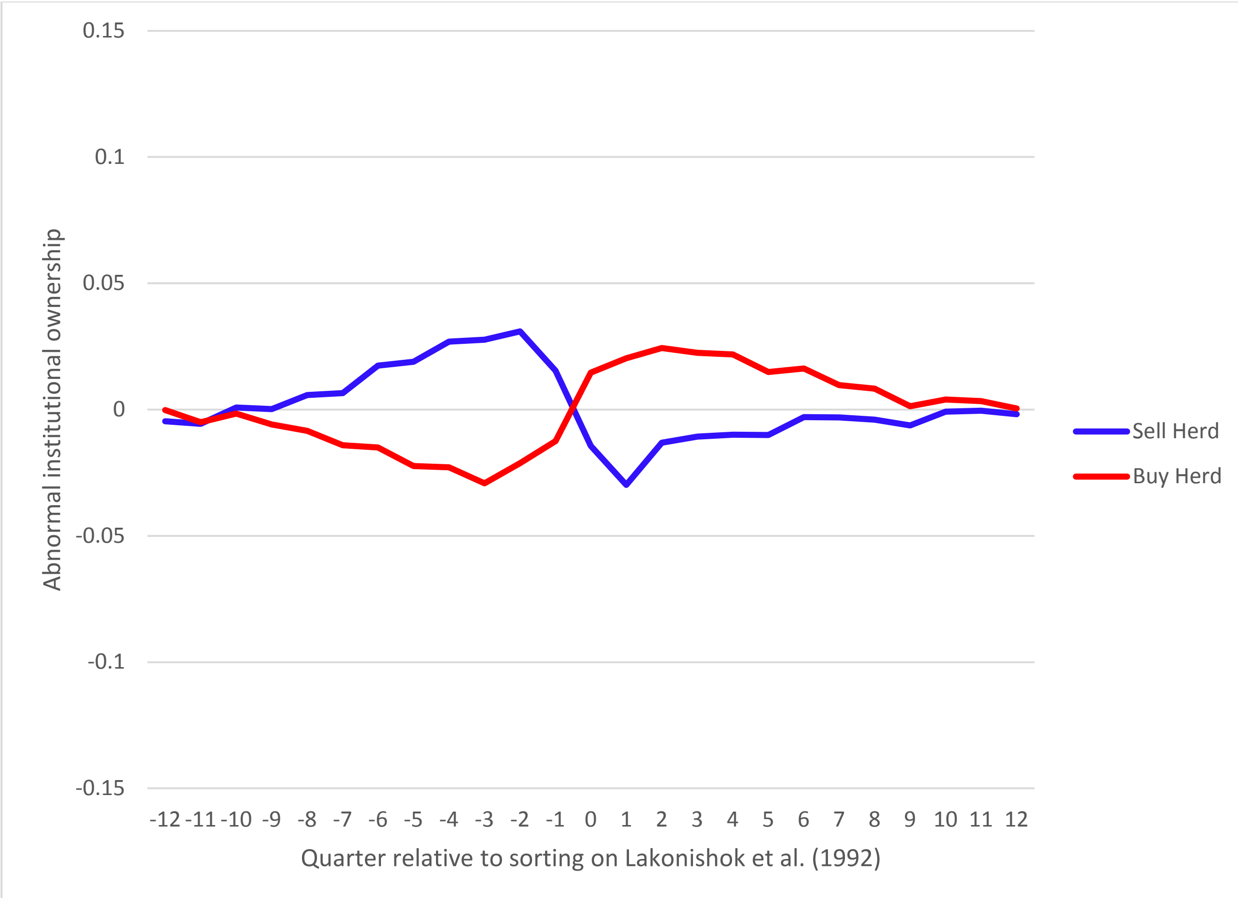


Figure 16. Mean abnormal institutional ownership in event time for Herding portfolios

Each June from 1980 to 2010, firms are sorted into 10 mutual fund herding portfolios following the methodology of Wermers (1999). There are a total of five buy herd portfolios and five sell herd portfolios. The table plots the equally-weighted level of abnormal institutional ownership for strongest buy and sell herd portfolios for the 12 quarters around the formation date. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600.

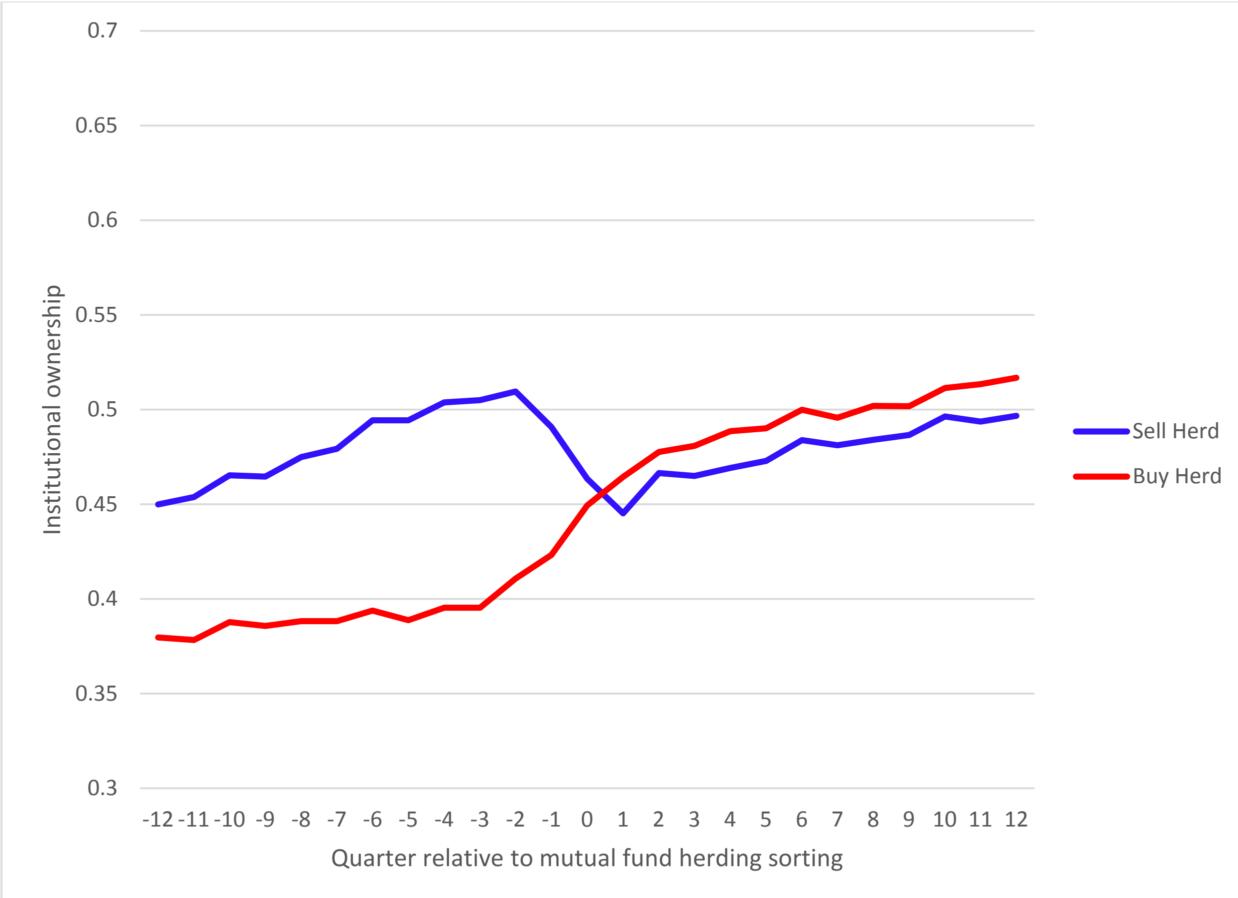


Figure 17. Mean institutional ownership in event time for Herding portfolios

Each June from 1980 to 2010, firms are sorted into 10 mutual fund herding portfolios following the methodology of Wermers (1999). There are a total of five buy herd portfolios and five sell herd portfolios. The table plots the equally-weighted level of institutional ownership for strongest buy and sell herd portfolios for the 12 quarters around the formation date.

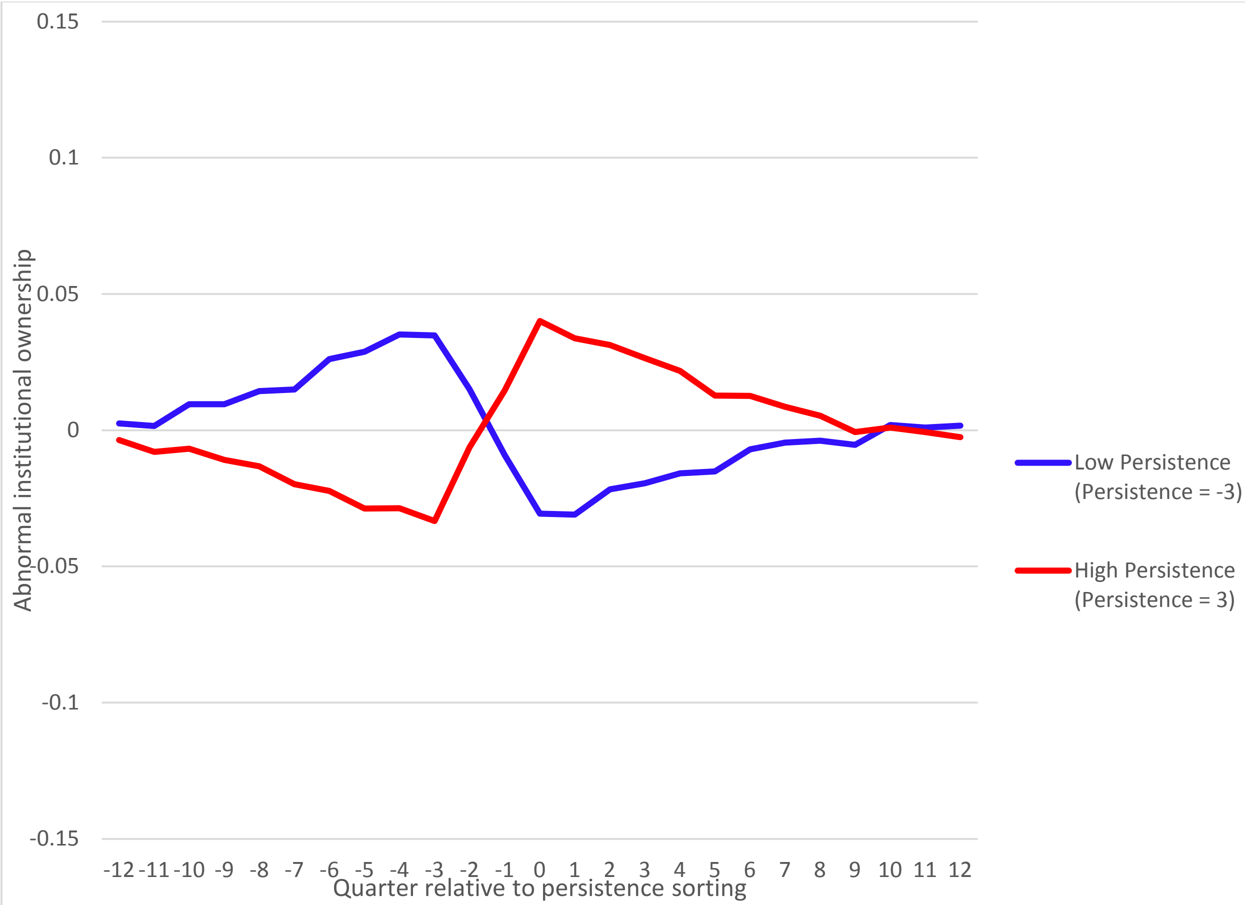


Figure 18. Mean abnormal institutional ownership in event time for persistence portfolios

Each June from 1980 to 2010, firms are sorted into five portfolios on the quarterly Dasgupta et al. (2011) persistence measure. The table plots the equally-weighted level of abnormal institutional ownership for low and high persistence portfolios for the 12 quarters around the formation date. Abnormal institutional ownership is defined as the residual institutional ownership after removing the trend from institutional ownership using the Hodrick-Prescott (1997) filter with λ equal to 1600.

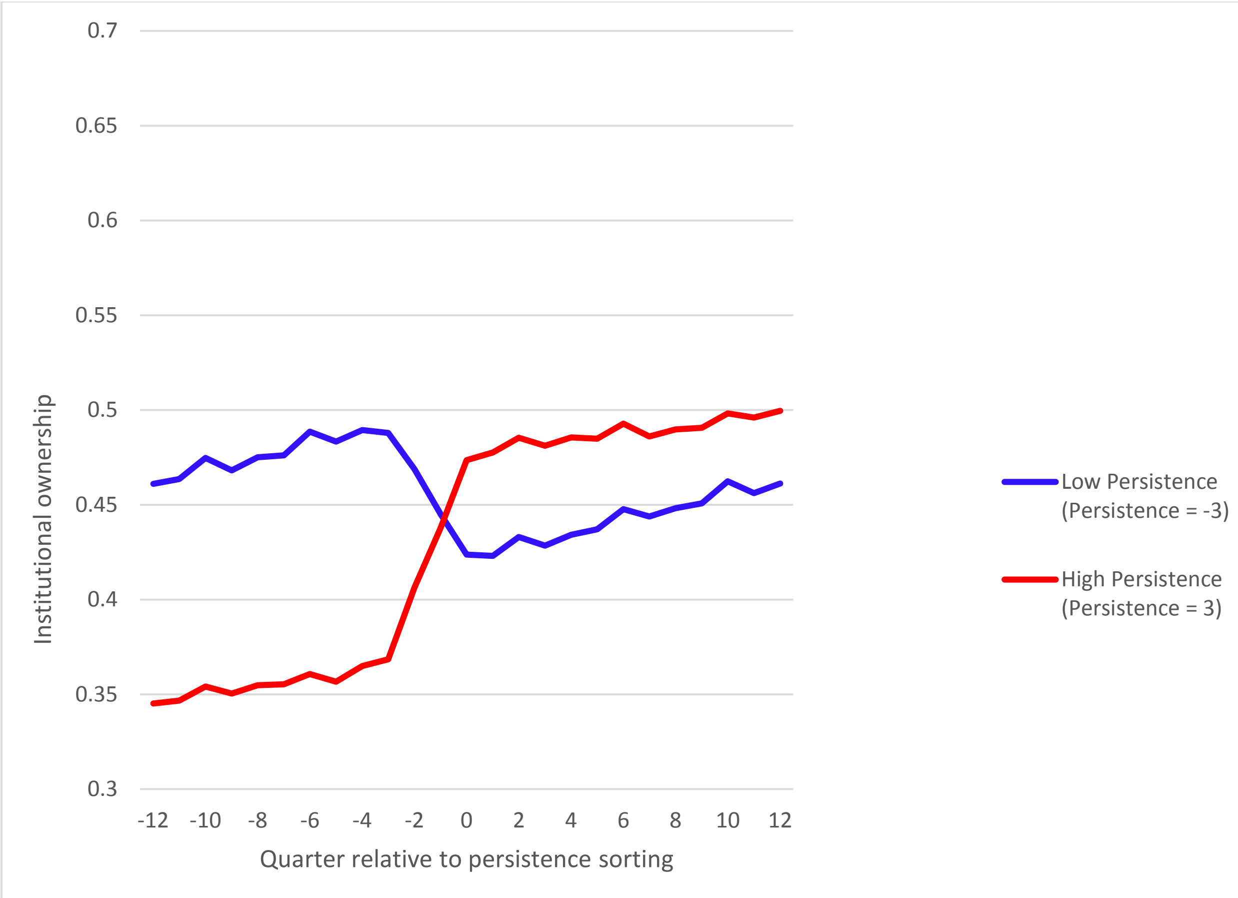


Figure 19. Mean institutional ownership in event time for persistence portfolios

Each June from 1980 to 2010, firms are sorted into five portfolios on the quarterly Dasgupta et al. (2011) persistence portfolios. The table plots the equally-weighted level of institutional ownership for the low and high persistence portfolios for the 12 quarters around the formation date.