Idiosyncratic Volatility and Informational Advantage of Institutional Investors

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Abstract

Existing literature suggests that growing institutional ownership has contributed to increases in aggregate idiosyncratic volatility over time. We argue that this positive relation is conditional on institutions’ investment horizon measured as institutions portfolio turnover – a proxy for informational advantage. First, we document that short-term (i.e. high portfolio turnover) institutional ownership reduces idiosyncratic risk, while long-term (i.e. low portfolio turnover) institutional ownership increases it. Our results are consistent with the notion that short-term institutions tend to be better informed. Therefore, in the process of trading, they actively exploit their informational advantage and tend to reduce the idiosyncratic risk of the traded stocks. Long term institutional trades, which are not information based, generate the positive relation between idiosyncratic risk and institutional ownership previously documented in the literature. Supporting this observation we find that short-term (long-term) intuitional ownership is negatively (positively) linked to idiosyncratic volatility across all firm sizes. Finally, we present evidence consistent with uninformed role of long-term institutional ownership. In particular, we observe that lagged ownership, rather than the change in institutional ownership drives the observed positive relation.

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Abstract

Existing literature suggests that growing institutional ownership has contributed to increases in aggregate idiosyncratic volatility over time. We argue that this positive relation is conditional on institutions’ investment horizon - a proxy for informational advantage. First, we document that short-term institutional ownership reduces idiosyncratic risk, while long-term institutional ownership increases it. Our results are consistent with the notion that short-term institutions tend to be better informed. Therefore, in the process of trading, they actively exploit their informational advantage and tend to reduce the idiosyncratic risk of the traded stocks. Long term institutional ownership, which is not information based, generates the positive relation between idiosyncratic risk and institutional ownership previously documented in the literature. Supporting this observation we find that short-term (long-term) institutional is negatively (positively) linked to idiosyncratic volatility across all firm sizes. Finally, we present evidence consistent with uninformed role of long-term institutional ownership. In particular, we observe that lagged ownership, rather than the change in institutional ownership drives the observed positive relation.

Introduction

This article investigates the relation between the investment horizon of institutional investors and the idiosyncratic risk of their investments. The hypothesis that institutional ownership is related to idiosyncratic volatility has been extensively studied in literature. On one hand, Campbell et al. (2001) and Xu and Malkiel (2003) propose that the increased institutional ownership in the market is responsible for the upward trend of aggregate idiosyncratic risk, and support their conjecture by showing a positive cross-sectional relationship between the volatility of the stocks in the SP 500 index and the percentage of institutional ownership. Dennis and Strickland (2004) provide additional support to this hypothesis using a larger sample of firms. On the other hand, financial institutions have an incentive to use the idiosyncratic risk
puzzle, a relevant risk measure for performing arbitrage under loss limits (Pontiff (2006)). In particular, financial institutions attempt to exploit the relative mispricing of individual assets; therefore, their trading activity should potentially reduce idiosyncratic return volatility\(^2\) on average.

Today’s trading environment is not only characterized by a significant increase in the presence of institutional investors\(^3\), but also by large variation in their trading behavior, generated by their different objectives, characteristics, restrictions, etc. The fact that presently we often see institutions on both sides of the same trade is the best supporting evidence that not all institutional trades are similarly motivated. In this study, we build on the idea that differently informed institutional investors may have different effects on idiosyncratic risk. First, we hypothesize that informed institutions, that trade to arbitrage mispricing should decrease the level of idiosyncratic risk. Second, we propose that institutions that trade because of other motives (i.e. liquidity, herding etc.) would generate the positive relation between institutional holdings and idiosyncratic risk documented in the literature. Since earlier literature does not make this distinction and focuses on total institutional ownership, the previously documented results can only capture the net effect of these opposite drivers for idiosyncratic risk. Hence, the positive relation between idiosyncratic risk and institutional ownership so far documented in these studies (Xu and Malkiel (2003)) may simply imply that the long term institutional ownership dominates on average.

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\(^2\) See Kang et al. (2011) for a discussion of the feedback effect between the trading activity of financial institutions and the probability of extreme realizations of idiosyncratic risk.

\(^3\) Using NYSE audit trail data, Jones and Lipson (2003) estimate that individual investors’ orders accounted for only 4% of daily volume for 60 NYSE stocks in November of 2002. Using a much larger sample of 2,034 stocks, Kaniel, Saar and Titman (2008) report that the NYSE audit trail weekly dollar volume associated with individual investors trades averages $4.3 million.
The notion that different institutions have different informational roles is not new to the literature. Yan & Zhang (2009) show that the positive relation between institutional ownership and future stock returns documented in Gompers & Metrick (2001) is driven by short-term institutional investors (i.e. high portfolio turnover). Given that the informational role of institutional investors should determine their ability to forecast returns, the authors document a significant relation between institutions’ investment horizon and their informational role and conclude that their results are consistent with the hypothesis that short-term institutions are better informed. To the extent that institutional herding is tied to institutions’ informational role, evidence that herding differs across investor types as documented by R. W. Sias (2004) can also be interpreted as supportive of the hypothesis that institutions have different informational roles in the market.

This article empirically investigates whether short term and long term institutional ownership has different effects on idiosyncratic risk. Following Yan and Zhang (2009) we use quarterly institutional holdings to construct an investment horizon measure based on institutions’ portfolio turnover and classify institutions into short-term and long-term investors based on this measure. We also calculate this turnover measure at institution-stock level, to capture whether the position of a given institution in a particular stock is long term or short term. To build idiosyncratic risk, we follow Ang et al. (2006) (hereafter AHXZ) and use daily return data to estimate quarterly idiosyncratic volatility relative to the Fama-French three factor model. We then examine whether the investment horizon affects the relation between institutional ownership and idiosyncratic risk.

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4 The theoretical foundation for institutional herding can be divided into five categories: informational cascades, investigative herding, reputational herding, fads, and characteristic herding (see Nofsinger and Sias 1999; Wermers 1999 for further discussions of these classifications).
In the time-series, we show that short term institutional ownership clearly dominates long term ownership after year 2000, which is consistent with the documented fact that since the market peak in 2000, the trend in idiosyncratic volatility seems to have reversed Brandt et al. (2009); Bennett & Richard W Sias (2006). Cross-sectionally, we show that the positive relation between total institutional ownership and idiosyncratic volatility documented in previous literature is mainly driven by large stocks, where long term ownership dominates. We find that short-term (long-term) institutional ownership is negatively (positively) linked to idiosyncratic volatility across all firm sizes.

Our results are consistent with the notion that short-term institutions tend to be better informed. Therefore, in the process of trading, they actively exploit their informational advantage and tend to reduce the idiosyncratic risk of the traded stocks. Long term institutional ownership, which is not information based, generates the positive relation between idiosyncratic risk and institutional ownership previously documented in the literature. Supporting this observation we find that short-term (long-term) institutional ownership is negatively (positively) linked to idiosyncratic volatility across all firm sizes. Further, to disentangle whether this relation is because of persistent demand shocks or informational advantage we decompose the current quarter short-term (long-term) institutional ownership into the lagged and change short-term (long-term) ownership. We show that both lags and changes in short term institutional ownership are significant for explaining idiosyncratic volatility (negative relation), whereas in the case of long term institutional ownership only lag ownership is statistically significant and positively related to idiosyncratic volatility. We interpret these results to be consistent with the proposed informational role story (i.e. short term institutions tend to be better informed and in the process of trading to actively exploit their informational advantage they actually reduce the idiosyncratic
risk of their holdings; on the other hand, long term institutional ownership is not information based, and hence changes in long term institutional ownership do not affect idiosyncratic volatility).

We contribute to the empirical asset-pricing literature on two dimensions. First, we document that previously observed positive relation between idiosyncratic volatility is conditional on the type of institution. In particular, we find that short term (long term) institutions tend to decrease (increase) idiosyncratic volatility, because their trades are more (less) informed. Second, we show that total institutional ownership indeed increases idiosyncratic volatility, however large stocks primarily drive this relation. This result can be observed because long term institutional investors have higher impact on larger stocks. To the best of our knowledge, this is the first paper that links idiosyncratic risk to different types of institutional investors.

The remainder of the paper is organized as follows. Section II discusses the background and related literature. Section III describes the data and general methodology employed in the analysis and provides some preliminary empirical results. Section IV reports our main empirical results and discusses their implications. Section V concludes.

II. Background

Other studies have looked at idiosyncratic risk and institutional investor characteristics. For example, Cremers & Pareek (2009) examine the effect of institutional investors’ investment duration on the efficiency of stock prices. They document that those institutional investors that have held a stock for a long time will behave differently when trading that stock than funds that have just bought it recently for the first time. Specifically, based on a behavioral bias argument,
the authors propose that overconfident investors trade more often and hence the presence of short-term investors can help explain increases in idiosyncratic volatility. It is important to note that although their average stock duration measure is introduced as a measure of investment horizon for institutional investors, it is conceptually different than the investment horizon measure built by Yan and Zhang (2009) that we use in this study.  

Obviously, it is important to note that there is a two-directional relation between institutional ownership and idiosyncratic risk. On one hand, the informational roles of long-term and short-term institutions would generate opposite effects on the idiosyncratic risk of their holdings (i.e. short-term ownership should decrease idiosyncratic risk as mispricings are arbitraged away). On the other hand, given that idiosyncratic risk itself may be costly for arbitrageurs (Shleifer & Vishny (1997)), it is possible that short-term institutional investors prefer investments with less idiosyncratic risk so that they can minimize their costs. Although we cannot infer causality without addressing this endogeneity issue, both scenarios imply that the relation between institutional ownership and idiosyncratic volatility is conditional on the informational role of the particular institution.

Our paper is also related to the rich literature attempting to explain the time-series trend in aggregate idiosyncratic volatility. Considerable research has been devoted to the fact that although market and industry risk remained relatively stable in the U.S. market between the early 1960s and the late 1990s, aggregate idiosyncratic volatility climbed steadily throughout the period (Campbell et al. (2001), Xu and Malkiel (2003), etc.). Moreover, since the market peak in 2000, this trend in idiosyncratic volatility seems to have reversed Brandt et al. (2009); Bennett & Richard W Sias (2006). Several explanations have been proposed, including increased

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5Cremers and Pareek duration measure captures the time in quarters for which an institutional investor holds a particular stock before selling it, while Yan and Zhang horizon measure captures the portfolio turnover of an institutional investor.
institutional ownership (Bennett, Sias, and Starks 2003; Xu and Malkiel 2003); retail trading behavior Brandt et al. (2009); more volatile firm fundamentals Wei & C. Zhang (2006); newly listed firms becoming younger and riskier (Fink et al. 2010; Brown and Kapadia 2007); increased volatility of cash flows induced by increased product market competition Irvine & Pontiff (2009).

The growing trends in institutional ownership and aggregate idiosyncratic risk have been associated based on the idea that trading done by institutional investors has increased the responsiveness of markets to changes in sentiment, thus contributing to the increase in idiosyncratic risk at aggregate level (Xu and Malkiel 2003). To the extent that institutions herd and that institutional trades move prices, firm volatility can be indeed positively affected by institutional ownership as suggested in previous literature. However, if institutions trade based on information (i.e. they exploit a particular stock’s mispricing relative to its exposure to systematic risk factors), their participation should push prices towards fundamentals and decrease the idiosyncratic risk in the process. Identifying different roles for long term and short term institutions can help explain the aggregate time trend of idiosyncratic risk.

Our main research question relates to the cross-sectional relation between institutional ownership and idiosyncratic risk. Specifically, we investigate whether this relation is conditional on the institutional investors’ horizon. We are interested to see whether the data supports the proposed informational role hypothesis. If short term institutional investors are better informed (as proposed by Yan and Zhang 2009) and trade actively to exploit their informational advantage, we should observe that there is a negative relation between short term institutional ownership and idiosyncratic volatility. On the other hand, long term ownership – which is not necessarily motivated by information – should be driving the positive result documented in
previous literature. We also investigate how these cross-sectional relations translate at aggregate level. If our conjecture is correct, the sign of the relation between overall institutional ownership and aggregate idiosyncratic risk at aggregate level should be dictated by the relative importance of institutions with long-term and short-term investment horizons, respectively.

The main points to be taken from the preceding discussion are that institutional trading is not necessarily all the same in terms of its effect on idiosyncratic risk, and that focusing on all institutional investors as a group can produce misleading results. Within a rational setting, the informational role of a particular institution should be an important conditional variable for this relation. Although there is a large body of literature studying the behavior of institutional trading and its impact on asset prices and returns, the connection between their informational role and idiosyncratic risk remains an open empirical question and is the focus of the current study. We proceed to our empirical investigation in the next section.

III. Data and Methodology

The quarterly institutional holdings for all common stock traded on NYSE, AMEX, and NASDAQ, for the period from March 1983 through December 2008 comes from Thomson Financial and is derived from institutional investors’ 13F filing. Returns, volume, shares outstanding and capitalization are from the Center for Research in Security Prices (CRSP). We eliminate any position where we cannot observe the institution’s holdings at the beginning of the quarter (e.g., an institution’s 13F report is missing for the quarter) and exclude from the analysis

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6 The Securities and Exchanges Commission (SEC) requires that all institutional investors with $100 million or more under management in exchange-traded or NASDAQ-quoted equity securities report all equity positions greater than 10,000 shares or $200,000 in market value to the SEC at the end of each quarter. They are required to file 13F reports within 45 days of the end of the calendar quarter. Because 13F reporting is aggregated across different units within an institution, the number of institutions reflects the number of unrelated institutions buying or selling the security.
securities with begin of quarter price less than two dollars and that have less than five traders during the quarter. We adjust stock splits by using the CRSP price adjustment factor.

To calculate idiosyncratic risk, we follow AHXZ and estimate idiosyncratic volatility relative to the Fama-French three-factor model. We examine quarterly idiosyncratic volatility using daily return data (we use quarterly series because institutional ownership data is only available at quarterly frequency)\(^7\). Specifically, for period \(t\) and stock \(i\), we estimate the following regression model:

\[
r_{i,s} = \alpha_i + \beta_{i,MKT}MKT_s + \beta_{i,SMB}SMB_s + \beta_{i,HML}HML_s + \epsilon_{i,s}
\]

where \(r_{i,s}\) is the return (excess of the risk free rate) of stock \(i\) on day \(s\) during the period \(t\). The idiosyncratic volatility of stock \(i\) during the period \(t\) is defined as the average of the squared residuals of the regression over the number of trading days in period \(t\), \(D_{i,t}\):

\[
IV_{i,t} = \frac{1}{D_{i,t}} \sum_{s \in t} \epsilon_{i,s}^2
\]

We use daily return data from CRSP and daily risk-free rate and Fama-French factors from Kenneth French’s website. Only common stocks (share code 10 and 11) of firms traded on NYSE, AMEX and Nasdaq are included in the sample. We require that stocks have more than 25 trading days for our quarterly estimation.

Our total institutional ownership measure for each stock \(i\), \(IO_{i,t}\) is calculated as the ratio of shares of \(i\) held by all institutions in quarter \(t\), to the total number of shares outstanding for stock \(i\) in quarter \(t\).

\[
IO_{i,t} = \frac{\text{Shares held by institutions}_{i,t}}{\text{Total shares outstanding}_{i,t}}
\]

\(^7\) Kang et al 2011 show that the quarterly and monthly idiosyncratic volatility series display similar trends.
We continue by classifying institutional investors into short term and long term institutional investors on the basis of their portfolio turnover over the past four quarters, following Yan and Zhang (2009). Specifically, for each institution $k$ in each quarter $t$, we compute the institution’s churn rate based on its aggregate buy and sale quantities as:

$$CR_{k,t} = \frac{\min(Buy_{k,t}, Sell_{k,t})}{\sum_{i=1}^{N_k} S_{k,i,t} P_{i,t} + S_{k,i,t-1} P_{i,t-1}}$$  \hspace{1cm} (4)$$

where the aggregate buy and sell are calculated as:

$$Buy_{k,t} = \sum_{i=1, S_{k,i,t}>S_{k,i,t-1}}^{N_k} \left| S_{k,i,t} P_{i,t} - S_{k,i,t-1} P_{i,t-1} - S_{k,i,t-1} \delta P_{i,t} \right|$$  \hspace{1cm} (5)$$

$$Sell_{k,t} = \sum_{i=1, S_{k,i,t} \leq S_{k,i,t-1}}^{N_k} \left| S_{k,i,t} P_{i,t} - S_{k,i,t-1} P_{i,t-1} - S_{k,i,t-1} \delta P_{i,t} \right|.$$  \hspace{1cm} (6)$$

and where $P_{i,t}$ is the share price for stock $i$ at the end of quarter $t$, and $S_{k,i,t}$ is the number of shares of stock $i$ held by investor $k$ at the end of quarter $t$. Next, we calculate each institution’s average churn rate over the past four quarters as

$$AVG_{t} CR_{k,t} = \frac{1}{4} \sum_{j=0}^{3} CR_{k,t-j}$$  \hspace{1cm} (7)$$

Each quarter, all institutional investors are sorted into three terciles based on their calculated average churn measure. Institutional investors ranked into the top tercile based on this measure are classified as short term institutions and institutions ranked in the bottom tercile are classified as long term institutions. For each stock, we define short-term (long-term) ownership as the ratio between the number of shares held by short term (long term) institutional investors and the total number of shares outstanding (we refer to these as SIO and LIO, respectively).
For our final sample, we only retain those observations from CRSP that found a match in the 13F Thomson database. For the entire sample period from 1983 to 2008, we have a total of 490,552 stock-quarter observations, for which we have both Thomson and CRSP data. For each quarter, mean cross-sectional institutional ownership and firm characteristics for the period from the second quarter of 1983 to the fourth quarter of 2008 (102 quarters). Panel A of Table 1 reports the time-series mean, media, maximum, minimum and standard deviation of these 102 cross-sectional statistics. Our results are comparable to results reported in previous literature.

[Insert Table 1 here]

The average total institutional ownership is 33.81% over our sample period (vs 25.1% reported by Yan and Zhang (2007) for the period from 1980 to 2003). On average, short-term institutions hold 10.05% of total shares outstanding, while long-term institutions hold 9.35% of all shares (compared to 7.91% and 6.56% reported by Yan and Zhang, respectively). In terms of firm characteristics, the average firm has a market capitalization of $1,275 million and quarterly idiosyncratic volatility of about 12%. The average number of stocks per quarter in our sample is 4,763. In comparison, Yan and Zhang (2007) report an average of 5,911 for their sample period.

Panel B of Table 1 reports the time-series average of the cross-sectional correlations between institutional ownership and the main firm characteristics considered for now – size and idiosyncratic volatility. While the positive association between size and institutional ownership is to be expected, it is interesting to note that in the overall sample the cross-sectional contemporaneous relation between idiosyncratic volatility and total institutional ownership, as well as its components, is on average negative. While this does not seem to support our initial
hypothesis, we cannot draw any conclusion without looking at multivariate regressions (which control for size, in particular).
IV. Empirical Results

Given that this project is still work in progress, we present our preliminary results in section 4.1 and describe future work yet to be completed in section 4.2.

4.1. Main Results

The evolution of long- and short- term institutional ownership through time is depicted in Figure 1. If these two types of institutional ownership have indeed opposite effects on idiosyncratic risk, the one type that dominates at any given point should be determining the net effect empirically observed in the data. Figure 1 shows how looking at total institutional ownership can be misleading, given that neither long term nor short term ownership dominates in the beginning of our sample. After 2000, we see short-term ownership clearly dominating long-term ownership. Although this graph does not provide conclusive evidence, our explanation based on different informational roles would be consistent with the reverse trend of idiosyncratic volatility after 2000 documented by Brandt et al. (2009) and Bennett & Richard W Sias (2006).

[Insert Figure 1 here]

We begin our empirical investigation by trying to reconcile the negative correlation between IO and IVOL documented in our table 1 with the positive contemporaneous cross-sectional relation between idiosyncratic volatility and total institutional ownership previously documented in the literature. Given the strong connection between idiosyncratic volatility, institutional ownership and size, we study this connection within separate size quintiles. Thus, we split our sample in five groups by total market cap, and then run Fama MacBeth regressions
of idiosyncratic volatility on total institutional ownership separately in each quintile. Results are presented in Table 2.

[Insert Table 2 here]

The first thing to notice is that the relation between total institutional ownership and idiosyncratic volatility is not the same across all size quintiles. Within the universe of large stocks, (Q5) we can replicate the positive relation documented by Yexiao Xu & Burton G. Malkiel (2003), who only study the SP500 universe and find results consistent with their conjecture that the institutionalization of the market played a role in increasing the volatility of individual stocks. Interestingly though, it seems that it is only the large stocks that may be leading that conclusion, as we do not observe the same type of relation in neither one of the other four columns of table 2 (Q1 through Q4). For the middle size groups (Q3 and Q4) the relation is negative and significant, while for the smaller stocks (Q1 and Q2) the relation is insignificant altogether, which is particularly interesting given that these groups of stocks have the highest idiosyncratic risk.

As mentioned in the previous section, one possible explanation for the brief preliminary results from Table 2 is that not all institutional ownership is the same in terms of its influence on idiosyncratic risk. If more or less information motivated institutional ownership (proxied by long term and short term institutional investors) influences the idiosyncratic risk of the stocks considered in opposite directions, then looking at total institutional ownership as we did in table 2 may provide misleading results. In order to further investigate this hypothesis, we should at least find different coefficients for a simple cross-sectional regression of idiosyncratic risk on
short term institutional ownership and long term institutional ownership. Results from several model variations for the contemporaneous quarterly relation between idiosyncratic volatility and type of institutional ownership are presented in Table 3. Although these are only preliminary tests and we have not yet included all relevant controls, we have controlled for size (given that this particular stock characteristic is highly related to both idiosyncratic risk and institutional ownership).

[Insert Table 3 here]

The first model looks at whether the positive relation documented by Yexiao Xu & Burton G. Malkiel (2003) for the SP500 and replicated in our Table 2 holds for our entire sample of stocks. As we can tell from the insignificant coefficient on IO, this is not the case (which is to be expected, given that within different size groups the relation between IO and IV has different directions). In model 2, we look at long term and short term institutional ownership separately to see whether the relation with idiosyncratic risk depends on the institutions’ informational role. As expected, we observe that idiosyncratic risk has a positive and significant relation with long term institutional ownership (the coefficient on LIO is 1.34 with a corrected t statistic of 9.36), but a negative and significant relation with short term institutional ownership (the coefficient on SIO is -1.327 with a corrected t statistic of -9.00). We run each one of the components (LIO and SIO) together with the total institutional ownership (models 3 and 4, respectively) to see whether one of the components is more important than the other. What we observe is that when SIO is included as a control variable (Model 3) the total institutional ownership variable assumes the role of LIO and takes a positive and significant coefficient; when LIO is included as a control, IO takes the role of the missing LIO and assumes a negative and significant coefficient. The
implication is that both components count, but with different signs. Although these results are only preliminary and much more work needs to be done, we can at least conclude that at this stage it seems like the relation between idiosyncratic risk and institutional ownership is different for long term and short term institutional investors and that it warrants further investigation.

We continue our investigation by examining the relation between idiosyncratic volatility and components of institutional ownership within different size quintiles. We are mostly interesting to see which one of the components is responsible for the switch in sign from large stocks relative to the rest that we documented in Table 2. We present the results in Table 4

[Insert Table 4 here]

The relation between long term institutional ownership (LIO) and idiosyncratic volatility is positive and significant across all size quintiles. However, the relation between SIO and IV is negative across all size quintile. This would explain why, when looking at all institutional investors as a group in table 2, results were ambiguous (i.e. positive and significant for large stocks, negative and significant for medium size stocks and negative but less significant for the smallest stocks). The other thing worth noticing is that splitting up the total institutional ownership into its components (LIO and SIO) has more than doubled the explanatory power of these models for every size category except the smallest stocks (for example, for large stocks we see a huge increase in adjusted R2 from 1.83% in Table 2 to 14.64% in Table 4).

Overall, the above results suggest that there exist systematic differences long- and short-term institutional ownership and the idiosyncratic risk of the stocks they are holding. We note that these results are just preliminary and should be interpreted with caution, but are encouraging
us to think that further investigation is warranted. Of course, such a contemporaneous relationship does not reveal causality, but it is consistent with our proposed hypotheses. Another potential explanation lies into different preferences of short- and long-term institutions. For example, Yan & Zhang (2009) show that in general, short term institutions prefer firms that are younger and in general are much less concerned about prudence than long-term institutions. Further, long-term institutions prefer S&P 500 firms, while short-term institutions are indifferent. Hence it is possible that the characteristic of the stock generates the type of institutional ownership and not the other way around.

We attempt to disentangle between these potential explanations by looking at lags and changes for each type of institutional ownership. When studying the relation between institutional ownership and returns, Gompers & Metric (2001) and Yan & Z. Zhang (2009) argue that this relation may be driven either by persistence in the demand shocks of institutions or by their informational advantage. To disentangle these two effects, they decompose the current quarter institutional ownership (IO\textsubscript{t}) into lagged institutional ownership (IO\textsubscript{t-1}) and the change in institutional ownership (ΔIO\textsubscript{t}). If the predictive ability of institutional ownership is due to demand shock, given that institutional holdings are quite stable, one would expect that IO\textsubscript{t-1} has a stronger predictive power. If institutional investors have an informational advantage, then ΔIO\textsubscript{t} should be a better predictor. To examine the sources of the relation between idiosyncratic risk and returns, we apply the same principle and decompose the current institutional holdings into lagged holdings and changes in holdings for both short- and long-term investors: SIO\textsubscript{t-1}, ΔSIO\textsubscript{t}, LIO\textsubscript{t-1}, and ΔLIO\textsubscript{t}. Next, for each quarter t we run the following cross-sectional regression:

\[
\text{Ln(IVOL)}_{i,t} = \beta_0 + \beta_1 SIO_{i,t-1} + \beta_2 LIO_{i,t-1} + \beta_3 ΔSIO_{i,t} + \beta_4 ΔLIO_{i,t} + \beta_5 \text{Ln(MktCap)}_{i,t} + \epsilon_{i,t} \quad (8)
\]
If the relation between institutional ownership and idiosyncratic risk is due to the stickiness of institutional ownership from one quarter to the next, we would expect to see significance in lags. On the other hand, if it is the informational role of long term and short term institutions that is generating this relationship, we would observe significance in the coefficient of changes. For results to support the informational role story we propose in section 2, we would expect to find a positive and significant coefficient on $\Delta SIO_{i,t}$ and a non-significant coefficient on $\Delta LIO_{i,t}$. Moreover, if institutional ownership predicts idiosyncratic risk and not the other way around we should observe significance on both lagged short term ownership ($SIO_{i,t-1}$) and lagged long term institutional ownership ($LIO_{i,t-1}$), albeit in different directions. Results from this regression are presented in Table 5.

[Insert Table 5 here]

Model 1 looks at short term institutional ownership and idiosyncratic volatility. We can see that both the lagged level of SIO and the change in SIO are significantly negatively related to the idiosyncratic volatility of the stock at time $t$. Thus results are supporting our proposed hypotheses that (1) short term institutional ownership decreases the idiosyncratic volatility of a stock (coefficient on lagged SIO) and (2) the predictive ability of short term institutional ownership over idiosyncratic volatility is due to their informational advantage (coefficient on Delta SIO). Model 2 depicts a different picture for long term institutional ownership. While long term institutional ownership at time $t-1$ increases the idiosyncratic volatility of the stock at time $t$ (coefficient on lagged LIO is positive and significant), it is unlikely that this increase is due to the informational role of long term institutional investors – the coefficient on DeltaLIO is not
significant. The same results persist in model 3, where we simultaneously control for both long term and short term institutional ownership lags and changes.

Overall, although not conclusive, we can interpret the preliminary results from table 5 as consistent with our proposed hypothesis that the relation between institutional ownership and idiosyncratic volatility of a given stock is conditional on the type of institutional ownership (more specifically, the informational role of a given institution in relation to a given stock). The simplified tests presented above are supportive of the idea that short-term and long-term institutional ownership has different effects on idiosyncratic risk and that further investigation is warranted.

4.2. Future Work

The first task to be completed deals with additional controls that need to be incorporated in our main tests. Of particular interest is the influence of incorporating returns in our tests. Considering returns should also help us make a stronger case for or against causality between institutional ownership and idiosyncratic volatility in the cross-section. Investigating the time series evolution of long term and short term institutional ownership in relation to aggregate idiosyncratic volatility is another avenue yet to be explored.

Additionally, different roles for long and short term institutional investors can shed some light on the controversial cross-sectional relation between idiosyncratic risk and returns discussed in the literature. Ang et al. (2006) report a negative relation between monthly stock returns and the one-month lagged idiosyncratic volatilities. Fu (2009) suggests that exponential GARCH models need to be used when analyzing this relation. He finds a positive relation between the GARCH estimated conditional idiosyncratic volatilities and expected returns.
Furthermore, he finds that Ang, et. al. (2006) negative relation is largely explained by the return reversal of small stocks with high idiosyncratic risk. As future work we intend to analyze the relation between idiosyncratic risk and stock returns traded by short-term and long-term institutions, separately. Because short-term institutions are considered as more informed than long-term institutions, then we will expect returns of stocks traded by short-term institutions to be positively related to idiosyncratic risk and the opposite to be true for stocks traded by for long-term institutions.

V. Conclusion

The upward trends in institutional ownership and aggregate idiosyncratic risk in the literature have been associated with institutional herding, increase of ownership overtime, and the fact that institutional trades move prices (Xu and Malkiel (2003)). However, if institutions trade based on information (i.e. they exploit a particular stock’s mispricing relative to its exposure to systematic risk factors), their participation should push prices towards fundamentals and decrease the idiosyncratic risk. Previous investigations of the relation between institutional demand and idiosyncratic volatility primarily focus on institutional investors as a group.

We argue that not all institutional ownership is the same in terms of its effect on idiosyncratic risk, and focusing an all institutional investors as a group can produce misleading results. We propose that the relation between institutional ownership and idiosyncratic volatility is conditional on institutions’ investment horizon - a proxy for informational advantage. Supporting this proposition we show that that the positive relation between total institutional ownership and idiosyncratic volatility documented in previous literature is mainly driven by large stocks, for which long term ownership dominates. We find that short-term (long-term)
institutional ownership is negatively (positively) linked to idiosyncratic volatility across all firm sizes.

Our results are consistent with the notion that short-term institutions tend to be better informed. Therefore, in the process of trading, they actively exploit their informational advantage and tend to reduce the idiosyncratic risk of the traded stocks. Long term institutional ownership, which is not information based, generates the positive relation between idiosyncratic risk and institutional ownership previously documented in the literature. Supporting this observation we find that short-term (long-term) institutional ownership is negatively (positively) linked to idiosyncratic volatility across all firm sizes.

Further, we find that both lags and changes in short term institutional ownership are significant for explaining idiosyncratic volatility (negative relation), whereas changes in long term institutional ownership are not significantly related to idiosyncratic volatility. We interpret these results to be consistent with the proposed informational role story (i.e. short term institutions tend to be better informed and in the process of trading to actively exploit their informational advantage they actually reduce the idiosyncratic risk of their holdings; on the other hand, long term institutional ownership is not information based, and hence changes in long term institutional ownership do not affect idiosyncratic volatility).
References:


Table 1
Descriptive Statistics

This table reports the descriptive statistics. The sample period is from 1983:Q2 to 2008:Q4. Institutional holdings are obtained from Thomson Financial (13F Filings). Stock characteristics are from the CRSP and COMPUSTAT databases. IO is total institutional ownership, calculated as the number of shares held by institutional investors divided by the total number of shares outstanding for each stock. SIO is short-term institutional ownership. LIO is long-term institutional ownership. Following Yan and Zhang (2009), an institutional investor is classified as a short-term investor if its past 4-quarter turnover rate ranks in the top tercile. An institutional investor is classified as a long-term investor if its past 4-quarter turnover rate ranks in the bottom tercile. MKTCAP is market capitalization. TURN is the average monthly turnover over the previous quarter. IVOL is the idiosyncratic volatility calculated based on AHXZ (2006). Panel A presents the time-series mean, median, maximum, minimum, and standard deviation of the quarterly cross-sectional averages. Panel B presents the time-series average of the cross-sectional correlations between institutional ownership and stock characteristics.

### Panel A: Time-series statistics of cross-sectional averages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
<th>StdDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Institutional Ownership - IO (%)</td>
<td>33.85</td>
<td>28.51</td>
<td>99.99</td>
<td>0</td>
<td>26.14</td>
</tr>
<tr>
<td>Short Term Inst. Ownership – SIO (%)</td>
<td>10.05</td>
<td>07.44</td>
<td>94.96</td>
<td>0</td>
<td>9.84</td>
</tr>
<tr>
<td>Long Term Inst. Ownership – LIO (%)</td>
<td>09.35</td>
<td>06.08</td>
<td>90.48</td>
<td>0</td>
<td>10.30</td>
</tr>
<tr>
<td>Size – MktCap ($ millions)</td>
<td>1,275</td>
<td>94</td>
<td>524,000</td>
<td>0</td>
<td>8,326</td>
</tr>
<tr>
<td>Turnover – TURN</td>
<td>1.25</td>
<td>0.52</td>
<td>1,777.62</td>
<td>0</td>
<td>10.12</td>
</tr>
<tr>
<td>Idiosyncratic Volatility – IVOL (%)</td>
<td>0.12</td>
<td>0.06</td>
<td>250.69</td>
<td>0</td>
<td>0.43</td>
</tr>
<tr>
<td>Returns – RET (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Panel B: Time-series mean of cross-sectional correlations between institutional ownership and stock characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Size</th>
<th>IVOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Institutional Ownership - IO</td>
<td>0.1514</td>
<td>-0.1090</td>
</tr>
<tr>
<td>Short Term Inst. Ownership – SIO</td>
<td>0.1852</td>
<td>-0.1014</td>
</tr>
<tr>
<td>Long Term Inst. Ownership LIO</td>
<td>0.0180</td>
<td>-0.0592</td>
</tr>
</tbody>
</table>
Table 2
Idiosyncratic Volatility and Total Institutional Ownership
Fama MacBeth Regressions by Size

This table summarizes the results of cross-sectional regressions of idiosyncratic volatility on total institutional ownership within different size quintiles. The sample period is from 1983:Q2 to 2008:Q4. Regression results are based on 102 quarterly regressions using the Fama-MacBeth approach of averaging coefficients and calculating Newey-West corrected t-statistics which are presented in parentheses. Each quarter, the universe of stocks is split into quintiles based on size (market capitalization). Within each quintile, the dependent variable is natural logarithm of idiosyncratic volatility - LN(IVOL) – calculated as described in Table 1; the explanatory variable – IO – is total institutional ownership, calculated as the number of shares held by institutional investors divided by the total number of shares outstanding for each stock. Coefficients followed by *, **, and *** are significant at 10%, 5% and 1% level, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Size Q1 (Small Stocks)</th>
<th>Size Q2</th>
<th>Size Q3</th>
<th>Size Q4</th>
<th>Size Q5 (Large Stocks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-6.731***</td>
<td>-7.063***</td>
<td>-7.204***</td>
<td>-7.649***</td>
<td>-8.520***</td>
</tr>
<tr>
<td></td>
<td>(-74.42)</td>
<td>(-76.45)</td>
<td>(-79.82)</td>
<td>(-74.05)</td>
<td>(-65.79)</td>
</tr>
<tr>
<td>IO</td>
<td>-0.255*</td>
<td>-0.184</td>
<td>-0.386***</td>
<td>-0.138**</td>
<td>0.391***</td>
</tr>
<tr>
<td></td>
<td>(-1.88)</td>
<td>(-1.60)</td>
<td>(-4.35)</td>
<td>(-2.34)</td>
<td>(4.15)</td>
</tr>
<tr>
<td>Adj R2</td>
<td>0.0050</td>
<td>0.0112</td>
<td>0.0147</td>
<td>0.0061</td>
<td>0.0183</td>
</tr>
</tbody>
</table>
### Table 3

**Idiosyncratic Volatility and Type of Institutional Ownership**  
*(Contemporary Relationship)*

This table presents the time-series averages of the slopes of quarterly cross-sectional regressions obtained using Fama and MacBeth (1973) methodology. Numbers in parentheses are Newey-West corrected t-statistics (using 3 lags). The sample period is from 1983:Q2 to 2008:Q4. The dependent variable is natural logarithm of idiosyncratic volatility - LN(IVOL) – calculated as described in Table 1; IO is total institutional ownership; SIO and LIO are short term institutional ownership and long term institutional ownership, respectively (calculated as in Yan and Zhang 2007); ln(MktCap) is the natural logarithm of size. Variable definitions follow those presented in Table 1. Coefficients followed by *, **, and *** are significant at 10%, 5% and 1% level, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-3.900***</td>
<td>-3.973***</td>
<td>-4.038***</td>
<td>-4.013***</td>
</tr>
<tr>
<td></td>
<td>(-22.16)</td>
<td>(-22.20)</td>
<td>(-22.64)</td>
<td>(-22.97)</td>
</tr>
<tr>
<td>IO</td>
<td>-0.0185</td>
<td></td>
<td>0.386***</td>
<td>-0.807***</td>
</tr>
<tr>
<td></td>
<td>(-0.27)</td>
<td></td>
<td>(5.31)</td>
<td>(-7.61)</td>
</tr>
<tr>
<td>SIO</td>
<td></td>
<td>-1.327***</td>
<td>-1.826***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-9.00)</td>
<td>(-12.69)</td>
<td></td>
</tr>
<tr>
<td>LIO</td>
<td>1.340***</td>
<td></td>
<td></td>
<td>2.377***</td>
</tr>
<tr>
<td></td>
<td>(9.36)</td>
<td></td>
<td></td>
<td>(12.19)</td>
</tr>
<tr>
<td>Ln(MktCap)</td>
<td>-0.294***</td>
<td>-0.288***</td>
<td>-0.279***</td>
<td>-0.282***</td>
</tr>
<tr>
<td></td>
<td>(-19.87)</td>
<td>(-19.96)</td>
<td>(-18.83)</td>
<td>(-19.80)</td>
</tr>
<tr>
<td>AdjR2</td>
<td>0.2442</td>
<td>0.2676</td>
<td>0.2579</td>
<td>0.2709</td>
</tr>
</tbody>
</table>
Table 4  
Idiosyncratic Volatility and Type of Institutional Ownership  
Fama MacBeth Regressions by Size

This table summarizes the results of cross-sectional regressions of idiosyncratic volatility on long and short term institutional ownership within different size quintiles. The sample period is from 1983:Q2 to 2008:Q4. Regression results are based on 102 quarterly regressions using the Fama-MacBeth approach of averaging coefficients and calculating Newey-West (3 lags) corrected t-statistics which are presented in parentheses. Each quarter, the universe of stocks is split into quintiles based on size (market capitalization). Within each quintile, the dependent variable is natural logarithm of idiosyncratic volatility - LN(IVOL) – calculated as described in Table 1. SIO and LIO are short term institutional ownership and long term institutional ownership, respectively (calculated as in Yan and Zhang 2007). Detailed variable definitions follow those presented in Table 1. Coefficients followed by *, **, and *** are significant at 10%, 5% and 1% level, respectively.

<table>
<thead>
<tr>
<th>Size Quintile</th>
<th>Size Q1 (Small Stocks)</th>
<th>Size Q2</th>
<th>Size Q3</th>
<th>Size Q4</th>
<th>Size Q5 (Large Stocks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(-73.95)</td>
<td>(-78.65)</td>
<td>(-83.35)</td>
<td>(-76.69)</td>
<td>(-76.27)</td>
</tr>
<tr>
<td><strong>SIO</strong></td>
<td>-0.0210</td>
<td>-0.815***</td>
<td>-2.130***</td>
<td>-2.135***</td>
<td>-1.553***</td>
</tr>
<tr>
<td></td>
<td>(-0.08)</td>
<td>(-3.75)</td>
<td>(-12.93)</td>
<td>(-11.57)</td>
<td>(-8.88)</td>
</tr>
<tr>
<td><strong>LIO</strong></td>
<td>0.405**</td>
<td>0.678***</td>
<td>0.901***</td>
<td>1.488***</td>
<td>2.567***</td>
</tr>
<tr>
<td></td>
<td>(2.25)</td>
<td>(2.79)</td>
<td>(4.56)</td>
<td>(11.90)</td>
<td>(15.77)</td>
</tr>
<tr>
<td><strong>Adj R2</strong></td>
<td>0.0052</td>
<td>0.0238</td>
<td>0.0563</td>
<td>0.0563</td>
<td>0.1464</td>
</tr>
</tbody>
</table>
This table presents the time-series averages of the slopes of quarterly cross-sectional regressions obtained using Fama and MacBeth (1973) methodology. Numbers in parentheses are Newey-West corrected t-statistics (using 3 lags). The sample period is from 1983:Q2 to 2008:Q4. The dependent variable is natural logarithm of idiosyncratic volatility at the end of quarter t - \( \ln(IVOL) \); \( \Delta SIO_t \) is the change in short term institutional ownership during quarter t (\( SIO_t - SIO_{t-1} \)), where \( SIO_{t-1} \) is the lagged short term institutional ownership. \( \Delta LIO_t \) is the change in long term institutional ownership during quarter t (\( LIO_t - LIO_{t-1} \)), where \( LIO_{t-1} \) is the lagged long term institutional ownership; \( \ln(MktCap) \) is the natural logarithm of size. Long and short term institutional ownership is calculated following Yan and Zhang (2007) (see detailed variable definitions in Table 1). Coefficients followed by * , **, and *** are significant at 10%, 5% and 1% level, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-4.220***</td>
<td>-3.719***</td>
<td>-3.992***</td>
</tr>
<tr>
<td></td>
<td>(-23.50)</td>
<td>(-20.56)</td>
<td>(-22.49)</td>
</tr>
<tr>
<td>( \Delta SIO_t )</td>
<td>-0.653***</td>
<td></td>
<td>-0.748***</td>
</tr>
<tr>
<td></td>
<td>(-5.48)</td>
<td></td>
<td>(-6.88)</td>
</tr>
<tr>
<td>( SIO_{t-1} )</td>
<td>-1.310***</td>
<td></td>
<td>-1.320***</td>
</tr>
<tr>
<td></td>
<td>(-8.35)</td>
<td></td>
<td>(-9.07)</td>
</tr>
<tr>
<td>( \Delta LIO_t )</td>
<td></td>
<td>0.273</td>
<td>0.224</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.34)</td>
<td>(1.11)</td>
</tr>
<tr>
<td>( LIO_{t-1} )</td>
<td></td>
<td>1.556***</td>
<td>1.546***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.59)</td>
<td>(10.46)</td>
</tr>
<tr>
<td>( \ln(MktCap) )</td>
<td>-0.258***</td>
<td>-0.322***</td>
<td>-0.289***</td>
</tr>
<tr>
<td></td>
<td>(-17.06)</td>
<td>(-21.98)</td>
<td>(-20.14)</td>
</tr>
<tr>
<td>Adj R2</td>
<td>0.2505</td>
<td>0.2635</td>
<td>0.2744</td>
</tr>
</tbody>
</table>
We classify institutions into short term and long term based on the measure used by Yan and Zhang (2009). This figure shows average institutional ownership for short-term (i.e. high turnover) and long-term (i.e. low-turnover) institutional investors each quarter from March 1983 to December 2008.