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The Performance of Short-Term Institutional Trades

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Abstract

Using a database of daily institutional trades, we document that a majority of short-term institutional trades lose money. In aggregate, over 23% of round-trip trades are held for less than 3 months, and the returns on these trades average −3.91% (nonannualized). These losses are pervasive across all types of stocks, with the lowest returns occurring in small stocks, value stocks, and low-momentum stocks. Short-term trades lose more in more volatile markets. Across funds, the worst short-term returns accrue to funds that do the most trading, and there is no evidence of persistent skill or disposition effect in short-term institutional trades.

I. Introduction

This paper documents the surprising finding that the shorter the holding period of an institutional trade, the more negative the return of the trade. We use data on the daily trades of institutions (money managers and pension funds) provided by a vendor hired to examine the trading costs of their clients. Mutual funds and defined-benefit asset managers have strong incentives to earn positive returns. The fact that they hire a vendor to analyze trade execution costs itself suggests that they care about returns. More broadly, Ma, Tang, and Gomez (2015) show that mutual

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fund managers have performance-based compensation contracts. Furthermore, empirical studies argue that stocks held by institutions are more efficiently priced (Boehmer and Kelley (2009)), better governed (Chung and Zhang (2011), Ferreira and Matos (2008)), and have lower agency costs (Wang and Nanda (2011)) than stocks held by retail investors, suggesting that institutional traders make informed trades. Yet their short-term trades do not earn positive returns on average. This paper is the first to document this surprising fact and explore possible explanations for this finding.

In contrast to the literature arguing or implying that institutional trades earn a positive return, our finding is consistent with a growing literature that classifies institutions as either "short term" or "long term" and finds temporary price distortions when short-term investors dominate trading. For example, Bushee and Noe (2000) show that when a firm's short-term (transient) institutional ownership percentage increases, stock return volatility also increases. Cella, Ellul, and Giannetti (2013) find that short-term institutions create price pressure during episodes of market-wide shocks, driving prices temporarily below the prices of stocks held more heavily by long-term investors. Cremers, Pareek, and Sautner (2014) find that the presence of short-term investors is associated with temporary price distortions and return anomalies. Cremers and Pareek (2016) find that among funds with high active share portfolios, only those with long stock holding periods outperform their benchmarks. Taken together, this literature suggests that short-term institutional trades are detrimental to stock pricing. However, none of these studies examines the actual daily trades of institutions. Instead, they rely on quarterly 13F data to develop statistics that characterize portfolios as short term or long term. The use of 13F filings for portfolio holdings does not fully reveal the actual holding period of an institution because firms' intraquarter round-trip trades do not show up in 13F filings.

In a closely related paper, Puckett and Yan (2011) examine trades that take place entirely within a calendar quarter, which is a more limited definition of short-term trades than the set of all short-term trades used in this paper. Approximately 54% of the under-3-month trades in our sample occur within a calendar quarter, but only approximately 36% of these trades match the intraquarter trades of Puckett and Yan (2011) because of their narrower definition (see Section II.C). Puckett and Yan show that trades that are initiated and closed (or marked to market) entirely within a quarter produce positive returns, a finding that we replicate in our sample. But portfolio managers know that trades within a quarter will not be disclosed on 13F filings and may strategically conduct those trades within a quarter to hide them from competitors. Therefore, round-trip trades that take place entirely within a calendar quarter could very well be different from round-trip trades of the same length that straddle calendar quarters. We suggest that to characterize the returns from short-term trades requires a broader definition of round-trip trades that includes the history of all short-term trades, including those that span days in 2 calendar quarters. To the best of our knowledge, our paper is the first to examine the trading horizons of institutions using this broader definition.

In this study, we examine short-term institutional trades using the entire record of buy and sell transactions in each stock to determine the length of time a fund holds a stock. In examining actual trades rather than trades inferred from

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quarterly holdings, we are also testing the validity of the conclusions drawn from trades inferred from 13F filings, as discussed in detail in Section II. Our sample consists of the daily U.S. equity transactions of 1,186 institutional money managers and pension funds that are present in a proprietary database for at least 5 years. A key advantage is that this database allows us to observe funds' actual buy and sell transactions on a daily basis, rather than relying on proxies such as quarterly changes in holdings. We match stock purchases and sales within each fund to identify the holding periods and returns of over 105 million round-trip trades between 1999 and 2009, with a total volume of over 291 billion shares. We find a surprising incidence of short-duration trades: Over 99% of the institutional funds execute round-trip trades lasting less than 3 months, and in aggregate, over 23% of the volume occurs in trades that are held for less than 3 months.

The prevalence of short-duration trades appears surprising in light of the generally low annual turnover rates reported for mutual funds and pension funds, typically averaging below 100%. But a turnover rate of 100% could arise from a fund trading all of its positions once a year, or trading half of its positions twice a year and not trading the other half of its positions, or a wide array of other combinations of short- and long-duration trades. Clearly, the greater the dispersion of trade durations that makes up a turnover rate, the less informative is the turnover rate about trade durations.[1] Our data set of round-trip trades at the fund level provides an inside examination of the trade durations behind fund turnover numbers.

We first examine the round-trip trades by holding period in aggregate for the entire sample. Short-duration trades have negative returns both in general and after adjusting for the performance of characteristic-based benchmarks, as in Daniel, Grinblatt, Titman, and Wermers (DGTW) (1997). For example, trades held for less than 3 months have an average raw (nonannualized) return of −3.91%, which remains a highly significant −1.24% after DGTW adjustment.[2] The losses occur across all types of stocks, although losses are larger for smaller stocks, value stocks, and low-momentum stocks and during times of high market volatility.

We next examine the performance of short-duration trades at the fund level, where trading decisions are made. The mean and median fund-level returns for short-duration trades are significantly negative. For example, the mean (median) 2- to 3-month trade returns for money managers is −2.64% (−2.94%), and for pension funds is −3.37% (−3.41%), both of which remain highly significant and negative after DGTW (1997) adjustment. Furthermore, we find that funds with the most short-duration trading and funds with the most trading overall tend to have the most negative short-duration trade returns. We find no evidence of skill in short-term trading: Funds that have the highest short-term trade performance

[1]The Investment Management Association (2011) points out that both the U.S. Securities and Exchange Commission and its European equivalent explicitly state that a fund's turnover rate is meant only to give investors a sense of how portfolio turnover and resulting transaction costs affect fund performance, not to give an indication of trade holding periods.

[2]These are principal-weighted average returns for trades held for less than 3 months, of which 6% are held for less than 1 week, 25% are held for 1 week to 1 month, 35% are held for 1–2 months, and 34% are held for 2–3 months.

in one period do not exhibit superior short-term trade performance in subsequent periods.

Finally, we briefly explore *why* fund managers engage in so much unprofitable short-term trading. One possible explanation is that fund managers unwind loss-making trades early because they receive new information suggesting that the trades will be even more unprofitable if held for longer. We find no evidence that managers are successfully "cutting their losses"; in fact, we find that, on average, their short-duration trades would have been profitable had they been held for a year instead of being closed out within 3 months. This pattern of realizing losses quickly although holding a trade longer would have been more profitable is consistent with the concept of recency bias (Tversky and Kahneman (1973)), in which people overweight recent experiences (in this case, a recent adverse price move). We find no evidence of fund managers exhibiting a disposition effect: On average, their short-duration trades have negative returns and their longer-duration trades have positive returns. Although some funds do earn positive returns on their short-duration trades in each period, we find no evidence of persistent skill. Furthermore, funds with the highest short-duration trade returns in one period do not make more short-duration trades in subsequent periods, ruling out overconfidence based on attribution bias as an explanation.

Our fund-level findings are consistent with fund managers "trading to look active," as modeled by Dow and Gorton (1997). Mutual fund and pension fund portfolio managers are closely monitored by either mutual fund advisors or pension fund clients and usually have performance-based contracts (Ma et al. (2015)). Dow and Gorton predict that fund managers who have no information-based reason to trade will nonetheless trade actively if whoever is monitoring them is unable to distinguish between actively doing nothing and simply doing nothing. Because trading to look active is not based on information, such trades are likely to be unprofitable.

These findings make several contributions to the literature. First, our results demonstrate the surprising finding that most institutional trades with holding periods of 9 months or less lose money. This finding is new to the literature and emerges directly from our broad identification of round-trip trades. Overall, our results are consistent with the findings from the "short-term institutions" literature documenting that these institutions are not trading on superior information.

Second, our results contribute to other streams in the literature. Corporate finance studies routinely use the percentage of common stock held by institutions as a proxy for the sophistication of the investors holding the security. Our results suggest that the short-term trades of institutions are broadly inconsistent with these views and more in line with agency conflicts and behavioral biases. Thus, our evidence supports the use of "long-term investors" (or "dedicated investors" in the terminology of Bushee (2001)) to establish the effects of sophisticated institutional investors rather than treating all institutions as homogeneous.

Third, the literature on delegated portfolio management offers substantial evidence that not all institutional investment decisions are based on information and return maximization. Mutual funds appear to select stocks based on familiarity (e.g., Coval and Moskowitz (1999)), sell stocks based on the disposition effect (Frazzini (2005)), and earn risk-adjusted returns lower than those earned

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from simple passive strategies (Fama and French (2010)).[3] For pension funds, the available evidence paints a similar picture (e.g., Busse, Goyal, and Wahal (2010)). Finally, Cremers and Pareek (2016) develop a measure of fund duration and show that "active share" results are driven by funds that hold stocks for 2 years or more. None of these studies uses daily trade records, and all base their conclusions on inferences from quarterly holdings. Although we show that short-duration institutional trades are broadly inconsistent with decisions made based on information, we reject the disposition effect and overconfidence based on attribution bias. Our results are consistent with recency bias, previously found only for retail investors (Nofsinger and Varma (2013)), and the agency cost of "trading to look active" noted by Dow and Gorton (1997).

The remainder of the paper is organized as follows: Section II describes our data and sample and details our methodology for identifying round-trip trades. Section III presents returns for trades held over different periods. In Section IV, we examine which short-term trades tend to lose money, and in Section V, we examine possible explanations. Section VI discusses robustness checks, and Section VII concludes. The Internet Appendix (available at www.jfqa.org) provides technical details related to the matching of Ancerno data to Center for Research in Security Prices (CRSP) data, identifying round-trip trades using different methodologies, comparisons to the Puckett and Yan (2011) round-trip trade methodology, and the double-clustered standard errors used throughout this paper.

II. Data, Methodology, and Sample

We obtain institutional trading data from Ancerno Ltd., a widely recognized consulting firm that monitors trade execution costs for institutional clients. In order to provide execution cost analysis, Ancerno collects detailed transaction information for all equity transactions executed by each client. Ancerno's clients include pension funds (e.g., California Public Employees' Retirement System, the Commonwealth of Virginia, and the YMCA retirement fund) and money managers (e.g., Massachusetts Financial Services, Putnam Investments, Lazard Asset Management, and Fidelity).[4] We also collect stock data from CRSP and Compustat.

A. The Necessity of Identifying Round-Trip Trades

Our study tests an important implication of the "short-term" institution literature (Bushee and Noe (2000), Cella et al. (2013), and Cremers and Pareek (2016)) that short-term institutions cause price distortions. A common statistic used in these studies to classify an institution as short term or long term is the "churn rate" developed by Gaspar, Massa, and Matos (2005). The churn rate for an institution is a measure of how frequently it rotates its position in all its stocks; this number falls in the interval [0,2]. If the dollar volume of trading is 0, the

[3] A recent exception to the generally negative assessment of fund managers is provided by Berk and van Binsbergen (2015), who find evidence that mutual fund manager skill exists and is persistent.

[4] Previous academic studies that use Ancerno data include those by Goldstein, Irvine, Kandel, and Wiener (2009) and Puckett and Yan (2011). Puckett and Yan (2011) estimate that Ancerno clients represent approximately 10% of all institutional trading volume.

churn rate is 0; if every stock is sold and replaced by another stock at the end of the quarter, the churn rate is 2. Studies employing the churn rate use holdings reported quarterly and consequently ignore round-trip trading within the quarter and the timing of large trades relative to the stocks held. A simple example of how the churn rate can be misleading is illustrated in Exhibit 1.

In the example in Exhibit 1, the "quarterly churn rate" applies the formula to the shares and prices based on the beginning and end of the quarter, ignoring the intraquarter trading revealed at day 45 (as in Gaspar et al. (2005) and subsequent studies). The "45-day churn rate" applies the formula to the shares and prices between the beginning of the quarter and day 45 (halfway through the quarter), and separately to the period from day 45 through the end of the quarter, to provide a more detailed view of each portfolio's trading. The prices never change, so the different churn rates are driven only by trading. The quarterly churn rate for the buy-and-hold portfolio (on the left) is almost twice as large as that for the actively traded portfolio (on the right), but it is entirely driven by one large trade in stock A. The buy-and-hold portfolio has constant holdings in stocks B, C, and D and clearly does not fit the "short-term" definition described by the literature examining short-term institutions. The actively traded portfolio, conversely, is obviously more short term, yet it has a much lower churn rate. The lower churn rate occurs because the actively traded portfolio reverts to close to its beginning-of-quarter holdings at the end of the quarter. If it reverted to exactly the same holdings, its churn rate would be 0. Of course, large price changes can offset the differences between the two portfolios, but in this example, the price of stock A would have to fall by more than 50% to equalize the two churn rates.

This simple example demonstrates how a statistic derived from quarterly filings to infer portfolio holding periods may not reflect the actual holding period of an institution. Even a widely accepted statistic like the churn rate can be misleading because intraquarter trades can offset short-term trades, driving the churn rate down, yet such intraquarter trades still signal the short-term focus of an institution. In addition, trading volume in a small number of stocks can easily bias

Exhibit 1
Example of Misleading Churn Rates

The formula from Gaspar et al. (2005) for the churn rate (CR) for fund i at date t is

$$CR_{i,t} = \frac{\sum_{j \in Q} |N_{j,i,t} P_{j,t} - N_{j,i,t-1} P_{j,t-1} - N_{j,i,t-1} \Delta P_{j,t}|}{\sum_{j \in Q} \frac{N_{j,i,t} P_{j,t} + N_{j,i,t-1} P_{j,t-1}}{2}},$$

where $N_{j,i,t}$ is the number of shares held of stock j by fund i at date t, and $P_{j,t}$ is the price of stock j at date t.

	Buy-and-Hold Portfolio						Actively Traded Portfolio					
	Qtr. Begin		Day 45		Qtr. End		Qtr. Begin		Day 45		Qtr. End	
Stock	Shares	Price	Shares	Price	Shares	Price	Shares	Price	Shares	Price	Shares	Price
A	20,000	22	40,000	22	40,000	22	2,000	22	4,000	22	2,000	22
B	1,000	41	1,000	41	1,000	41	1,000	41	500	41	1,500	41
C	1,700	32	1,700	32	1,700	32	1,700	32	2,400	32	1,000	32
D	0	27	0	27	0	27	0	27	750	27	0	27
	45-day churn rates:		0.582		0.000		45-day churn rates:		0.621		0.875	
	Quarterly churn rate:				0.582		Quarterly churn rate:				0.310	

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this measure. We note that the use of churn rates may be clearly powerful for some classes of investment decisions, such as the large responses by institutions to market-wide volatility (Cella et al. (2013)), because quarterly holdings are likely to be dramatically affected in the same direction for all institutions. If most prices in the market move in the same direction and most institutions that trade do so in roughly the same direction, then the churn rate will capture differences between institutions. For normal market periods, the churn rate is a noisy proxy for holding periods, and an examination of actual holding periods is warranted.

B. Identifying Round-Trip Trades

To identify round-trip trade holding periods, we match buy and sell transactions for the same stock within the same fund. We use both the first-in, first-out (FIFO) and last-in, first-out (LIFO) methods because there is no consensus on which method should be used to match buy and sell transactions to form round-trip trades. On the one hand, a consultant to institutional fund managers told us that "the clock starts when you enter the trade," implying the FIFO approach may be more appropriate. On the other hand, LIFO may more accurately capture the change in opinion or information that causes a manager to switch from buying to selling or vice versa. In most of our analyses, the FIFO and LIFO trade-matching methodologies yield identical inferences, so we present only results based on the FIFO methodology; where the results differ materially, we present and discuss both.

From the 2010 Ancerno database, we obtain the following information for each transaction: The ticker symbol of the security (SYMBOL); the transaction date (TRADEDATE); the identifier for the institution (CLIENTCODE), such as Fidelity or Putnam; the identifier for the fund within an institution (CLIENTMGRCODE), such as Fidelity Magellan or Fidelity Equity Income fund; the transaction direction (SIDE), which is 1 for buy and −1 for sell transactions; the volume of shares transacted (VOLUME), and the transaction price (PRICE). All CLIENTCODEs and CLIENTMGRCODEs are expressed as numbers, so although we can identify all the transactions executed by the same institution or the same fund, we cannot determine the identity of the institution or fund. For each SYMBOL_CLIENTCODE_CLIENTMGRCODE combination, we use data from Jan. 1997 to Dec. 2009 to identify round-trip trades. A round-trip trade for a stock is defined as a purchase and a sale of the same number of shares in the same fund (identified by CLIENTCODE_CLIENTMGRCODE).

It is worth mentioning that the composition of the Ancerno database has changed since the version that we use. These changes include name changes for some variables and revelation of the identities of funds. It is important to our research design that the funds know their trades will be kept confidential and that there is a clean match between fund and fund family. It appears that Ancerno has complicated this match in subsequent database releases. The database we use is similar to the one used by Hu, McLean, Pontiff, and Wang (2014), who also discuss these changes.

To identify the FIFO-based (LIFO-based) round-trip trades, we assemble the transaction information for each SYMBOL_CLIENTCODE_CLIENTMGRCODE combination chronologically into a queue, and when a

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transaction in the opposite direction enters the queue, we match it with the earliest (most recent) existing transaction in the queue. The number of trading days between the buy transaction and the sell transaction is the holding period of the round-trip trade, and the number of shares bought and sold (which are equal under the definition of a round-trip trade) is the round-trip trade quantity. We provide examples of our FIFO and LIFO trade-matching procedures in the Internet Appendix.

We note that the Ancerno data set has no information on a fund's holdings at any time; only transactions are reported to Ancerno. Our method effectively initializes each SYMBOL_CLIENTCODE_CLIENTMGRCODE combination with 0 shares, and we discard the first 2 years of the data set because Ancerno coverage is sparse (as in Anand, Irvine, Puckett, and Venkataraman (2013) and Goldstein et al. (2009)). All of our analyses are based on round-trip trades from the sample period Jan. 1999–Dec. 2009.

We apply the following filters to remove potentially misleading or erroneous trades. We discard all trades with CLIENTCODE equal to 0, which indicates that Ancerno cannot reliably track the fund over time. We also discard trades with a buy price or sell price of less than 1 cent. To ensure that the number of shares traded and the trade prices are comparable between the buy and sell dates, we exclude round-trip trades in which the buy and sell dates straddle a stock-split date (e.g., the stock was bought before a split date and sold after the split date).[5] Approximately 6% of the FIFO round-trip trades (5% of the LIFO round-trip trades) are eliminated from our sample by this screen; fewer LIFO trades are eliminated because they tend to be shorter and span fewer of the stock-split dates. Finally, we exclude intraday trades (in which a fund buys and sells the same stock on the same day) because intraday time stamps in Ancerno are incomplete (e.g., Anand et al. (2013)).

C. Differences from Puckett and Yan Methodology

To assemble our sample, we form a queue of all buys and sells a fund makes in a stock from the beginning of the Ancerno database and match the buys with sells using either the FIFO or LIFO rule to determine trade holding periods and returns. In contrast, Puckett and Yan (2011) examine all buys and sells within a stock-quarter and identify intraquarter round-trip trades if the same fund has both buys and sells for a stock within a quarter, calculating returns using a weighted-average price, FIFO, or LIFO. The Puckett and Yan method effectively starts with a clean slate at the beginning of each calendar period, whereas our method considers how a fund's trading before a quarter affects the interpretation of trading within the quarter. As a result, the two methodologies can give rise to starkly

[5] From the CRSP data, we identify 4,800 stock splits and stock dividends (CRSP DISTCD = 5523, 5533, 5543) involving 2,795 stocks in our sample (see the Internet Appendix for details of matching Ancerno data to CRSP). We note that the inclusion of dividend distributions in this filtering treatment is a conservative approach. If managers typically keep the shares they receive as a stock dividend, retaining trades straddling dividend dates would affect the quantity in the calculation of round-trip trades; however, if managers automatically convert dividend distributions into cash, stock dividends would be immaterial to our round-trip trade calculations. Because we cannot identify which action specific managers adopt with respect to stock dividends, we discard all round-trip trades straddling stock dividend distributions as well as stock splits.

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different identification of short-term trades that occur within a calendar quarter, and the round-trip trades identified under different methods are not subsets of each other.[6] Examples of how the two methodologies can give rise to different and nonoverlapping trade categorizations are provided in the Internet Appendix.

We believe that using the entire pattern of trading best represents the round-trip trades for the purpose of investigating questions raised in the literature about the information content of short-term institutional trades. To determine whether the average institutional portfolio manager is skilled and/or informed, it is necessary to look jointly at all of the manager's trading decisions and the times at which these decisions are made.

D. Sample Descriptive Statistics

Table 1 presents descriptive statistics for the full sample of FIFO round-trip trades and for the subsample of trades made by funds that are present in the Ancerno universe for at least 5 years.[7] A natural concern when analyzing trade holding periods is whether the incidence of short-duration trades is unduly influenced by the presence of funds that remain in the universe for only a short period of time. For example, we obviously cannot observe round-trip trades longer than 1 year for a fund that is in the universe for only 1 year. Of the 4,053 unique funds appearing in the universe between 1999 and 2009, 1,059 funds are present for 1 year or less, and 1,186 funds are present for 5 or more years. In Table 1 we present descriptive statistics for both the full sample of 4,053 funds and the subsample of 1,186 funds that are present for at least 5 years, which are the focus of our study; in the remainder of the paper, we present results only for the sample of funds present for at least 5 years.

Panel A of Table 1 shows that the 4,053 funds in the full sample belong to 772 distinct institutions; the 1,186 funds in the subsample of funds present for 5 or more years belong to 324 distinct institutions. In both samples, the median institution has 3 funds. In the full sample, there are over 328 billion shares and over $10 trillion in round-trip trades.[8] Although only 29% of the funds in Ancerno are present for 5 or more years (1,186 of the 4,053 funds), they account for approximately 88% of the share volume and dollar volume in the

[6]The key difference between Puckett and Yan's (2011) analysis and ours is that we are interested in trade holding periods, whereas Puckett and Yan are specifically interested in intraquarter trading. This distinction leads to different trade classifications in our study versus theirs. For example, a trade initiated on Jan. 15 and closed out on Mar. 15 of the same year would be considered an interim round-trip trade by Puckett and Yan, but a trade initiated on Mar. 15 and closed out on May 15 of the same year would not; both trades would be categorized as 2-month trades in our study. Conversely, a trade initiated on Mar. 15 and closed out on Sept. 15 of the same year would be marked to market on Mar. 31 in Puckett and Yan's interim trading performance measure; in our study, the trade would be categorized as a 6-month trade and would not be marked to market on Mar. 31.

[7]Table 1 for LIFO round-trip trades is virtually identical and available from the authors.

[8]We note that the number of round-trip trades, also reported in the table for completeness, may not be as informative for estimating liquidity as the volume statistics, both because the average size of equity trades falls considerably during the sample period (Chordia, Roll, and Subrahmanyam (2011)) and because in some cases, our identification of round-trip trades counts orders that are executed in multiple pieces as separate trades. Hvidkjaer (2008) provides evidence that institutions increasingly engage in order-splitting strategies, resulting in more small trades originating from large institutional investors.

TABLE 1
Sample Descriptive Statistics

Table 1 presents statistics for all first-in, first-out (FIFO) round-trip trades in common stocks for the entire universe of pension and money manager funds reporting to Ancerno ("Full Sample") and the subset of funds that are present in the Ancerno database for 5 or more years ("Funds Present 5 or More Years"). Panel A presents descriptive statistics for the 2 samples, and Panel B presents the distribution of round-trip trades for each sample by stock market capitalization decile. Market capitalization deciles are determined from Center for Research in Security Prices (CRSP) data, based on the market capitalization of each stock at the end of the year prior to the initiation of the trade. Institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009.

Panel A. Funds, Institutions, and Round-Trip Trades

Descriptor	Full Sample	Funds Present 5 or More Years
No. of funds	4,053	1,186
Pension funds	3,811	1,102
Money managers	242	84
No. of institutions	772	324
Median number of funds per institution	3	3
Total share volume of round-trip trades (billions)	328.41	291.13
Pension funds	30.07	18.83
Money managers	298.34	272.30
Total dollar volume of round-trip trades ($trillions)	10.08	8.94
Pension funds	0.91	0.55
Money managers	9.17	8.39
Total number of round-trip trades (millions)	121.03	105.59
Pension funds	9.51	6.25
Money managers	111.52	99.33
Total no. of stocks traded	9,737	9,407

Panel B. Distribution of Round-Trip Trades by Stock Market Capitalization Decile

	Full Sample			Funds Present 5 or More Years		
Decile	% Share Volume	% Dollar Volume	% Trades	% Share Volume	% Dollar Volume	% Trades
D1 (smallest)	0.03	0.02	0.04	0.03	0.01	0.03
D2	0.11	0.03	0.13	0.11	0.02	0.09
D3	0.26	0.08	0.28	0.26	0.07	0.23
D4	0.62	0.19	0.75	0.62	0.19	0.68
D5	1.25	0.50	1.64	1.25	0.50	1.56
D6	2.23	1.03	3.02	2.21	1.01	2.89
D7	4.05	2.24	5.30	4.01	2.21	5.06
D8	7.36	4.88	8.92	7.29	4.84	8.61
D9	15.21	11.97	14.96	15.14	11.86	14.48
D10 (largest)	68.88	79.06	64.96	69.09	79.27	66.36
Total	100.00	100.00	100.00	100.00	100.00	100.00

full sample. These long-lived funds also trade over 96% of the stocks traded in the full sample. In both the full sample and the subsample of funds present for 5 or more years, the majority of the funds are pension funds, but the majority of trading is done by money managers. For example, among the funds present for 5 or more years, money managers represent only 7% of the funds but account for over 93% of the share volume traded. We analyze money managers and pension funds separately because their differences may lead to different inferences (e.g., Lakonishok, Shleifer, and Vishny (1992)).

Panel B of Table 1 shows that the trades in both the full sample and the subsample of funds present for 5 or more years are heavily weighted toward large-capitalization stocks. Over 80% of the share volume in each sample occurs in stocks in the 2 largest market-capitalization deciles, whereas less than 0.5% of the share volume occurs in the 2 smallest deciles. This pattern of institutional trading volume being concentrated in large-cap stocks is consistent with the literature on

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institutional holdings. For example, Lewellen (2011) finds that between 1980 and 2007, large-cap stocks (above the New York Stock Exchange (NYSE) 80th percentile) account for over 80% of institutional holdings, whereas micro-cap stocks (below the NYSE 20th percentile) constitute approximately 1% of total institutional holdings.

Table 2 presents the breakdown of institutional round-trip trades by holding period, from less than 1 week to 4 or more years. Panel A shows the breakdown for round-trip trades identified using the FIFO method, and Panel B shows analogous breakdowns using the LIFO method. The columns labeled "Aggregate Shares" in each panel report holding-period share percentages calculated across all trades in each sample. A significant portion of trades are held for short holding periods. For example, using the FIFO method (Panel A), over 7% of share volume occurs in trades with round-trip durations of less than 1 month, and over 23% of share volume occurs in round-trip trades lasting less than 3 months (see Aggregate Shares, Cumulative % column). Using the LIFO method to identify round-trip trades results in even more short-duration trades, mainly for the mechanical reason

TABLE 2
Round-Trip Trades by Holding Period

Panel A of Table 2 presents statistics based on round-trip trades defined using first-in, first-out (FIFO) methodology; Panel B presents statistics based on round-trip trades defined using last-in, first-out (LIFO) methodology. "Holding Period" refers to the time between when a trade is initiated and when it is unwound. The "Aggregate Shares" columns present percentages calculated across all round-trip trades in each category; the "Fund-Level Cumulative Percentages" columns present statistics about the cumulative percentages of share volume in trades with holding periods less than or equal to the period specified, across the funds in each sample. Institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years.

Holding Period		Aggregate Shares		Fund-Level Cumulative Percentages (%)			
				Money Manager		Pension	
At Least	Less Than	%	Cumulative %	Mean	Median	Mean	Median
Panel A. FIFO Round-Trip Trades							
1 day	1 week	1.38	1.38	1.37	0.98	1.30	0.26
1 week	1 month	5.80	7.18	7.23	6.05	5.18	3.42
1 month	2 months	8.00	15.18	15.25	14.35	11.73	9.45
2 months	3 months	7.87	23.06	23.13	23.11	18.48	16.09
3 months	4 months	7.49	30.54	30.36	29.88	25.07	23.05
4 months	5 months	6.82	37.37	36.92	36.75	31.12	29.81
5 months	6 months	6.02	43.39	42.82	42.71	36.58	36.23
6 months	9 months	14.80	58.18	57.15	58.39	50.57	52.25
9 months	1 year	10.59	68.77	67.67	70.20	61.28	64.35
1 year	2 years	19.77	88.54	88.93	90.61	84.30	88.99
2 years	3 years	6.74	95.28	95.98	97.03	93.28	96.61
3 years	4 years	2.64	97.92	98.40	99.18	97.09	99.23
4 years		2.08	100.00	100.00	100.00	100.00	100.00
Panel B. LIFO Round-Trip Trades							
1 day	1 week	11.83	11.83	6.86	5.62	1.98	0.72
1 week	1 month	16.06	27.90	20.16	18.24	8.42	6.23
1 month	2 months	11.89	39.79	31.74	30.89	17.39	14.94
2 months	3 months	8.42	48.20	40.63	41.18	25.52	23.67
3 months	4 months	6.55	54.76	47.70	48.48	32.81	31.81
4 months	5 months	5.32	60.08	53.70	54.99	39.09	39.26
5 months	6 months	4.39	64.47	58.53	60.84	44.61	45.18
6 months	9 months	9.59	74.06	69.49	72.29	57.86	60.92
9 months	1 year	6.45	80.50	77.26	79.59	67.51	71.75
1 year	2 years	11.91	92.41	91.98	92.97	86.92	90.76
2 years	3 years	4.21	96.62	96.78	97.28	94.20	96.90
3 years	4 years	1.83	98.45	98.66	99.26	97.47	99.20
4 years		1.55	100.00	100.00	100.00	100.00	100.00

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that the LIFO method matches a transaction to its most recent preceding opposite-side transaction, rather than the longest-ago opposite-side transaction under FIFO. Panel B shows that using the LIFO method, over 27% of share volume occurs in trades held for less than 1 month, and over 48% occurs in trades held for less than 3 months (Aggregate Shares, Cumulative % column).

Further insight is provided by the cross-sectional fund-level statistics in the last 4 columns of Table 2, which report the mean and median across the individual funds' cumulative percentages. Whereas the mean and median fund-level cumulative percentages are broadly in line with the aggregate cumulative percentages, money managers, on average, do more short-duration trades than pension funds, and the shortest-duration trades are more concentrated in a smaller number of funds. For example, Panel B shows that in aggregate, 11.83% of share volume occurs in LIFO trades held for less than 1 week (Panel B, Aggregate Shares, Cumulative %), but the average money manager and pension fund, respectively, have only 6.86% and 1.98% of their share volume in trades held for less than 1 week.[9] Because we are interested in the behavior of individual fund managers, our subsequent analyses examine fund-level behavior as well as the aggregate sample of trades.

Figure 1 provides further insight into the prevalence of short-duration trades at the fund level. The incidence of short-duration trades is not driven by only a few extremely active funds: Of the 1,186 funds that are present for 5 or more years, only 43 funds engage in no round-trip trades lasting less than 1 month based on the FIFO method of identifying round-trip trades (Graph A). Of the other 1,143 funds, trades lasting less than 1 month account for 1%–3% of trading volume in 477 funds, 3%–6% of trading in 343 funds, 6%–10% of trading in 180 funds, and over 10% of trading in the remaining 143 funds. The remaining graphs in Figure 1 depict the analogous fund frequency distributions for trades defined under the LIFO method and for trade holding periods of less than 3 months.

III. Holding-Period Returns

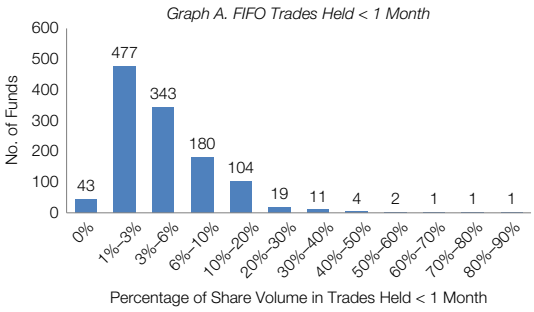
The key finding of the studies that use churn rates is that short-term trading is not necessarily based on the economic fundamentals of the stocks. If short-term trades are based on economic fundamentals (or successfully anticipating flows from other traders), the trades should result in positive returns on average. Table 3 presents average raw returns (Panel A) and returns adjusted per DGTW (1997) (Panel B) for round-trip trades by their holding periods; trade returns are weighted by principal amount (initial share price $\times$ number of shares) within each holding-period category. The raw return is the percentage price change in the stock. The DGTW-adjusted return is the raw return of each stock minus the DGTW (1997) benchmark return, where the DGTW benchmarks are the value-weighted returns to portfolios of stocks sorted into quintiles by size, book-to-market ratio, and past

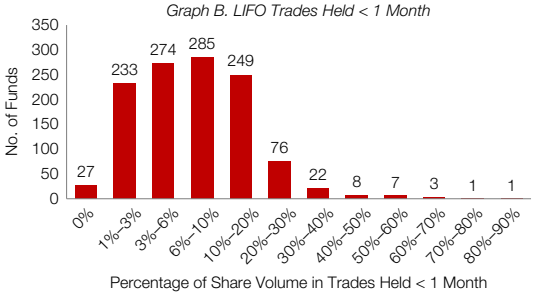
[9]Note that the aggregate-share measures simply sum across all shares traded, irrespective of the funds in which they occur, so they are not equal to a weighted average of the mean for money managers and the mean for pension funds.

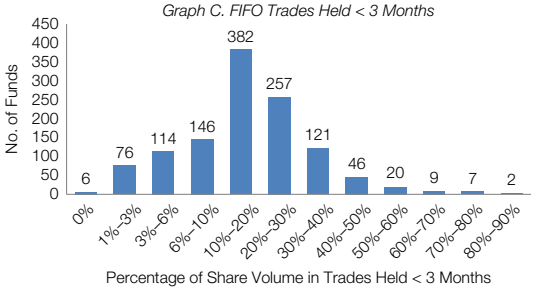
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FIGURE 1
Proportion of Short-Duration Trades by Fund

In Figure 1, the institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years. Graphs A and B present the percentages of round-trip trading volume of each fund that occurs in trades held for less than 1 month under the first-in, first-out (FIFO) and last-in, first-out (LIFO) methods for identifying round-trip trades. For example, in Graph A, the fifth bar shows that for 104 funds in the database, trades held for less than 1 month account for between 10% and 20% of their total trading volume. Graphs C and D present the percentages of round-trip trading volume for each fund that occurs in trades held for less than 3 months.







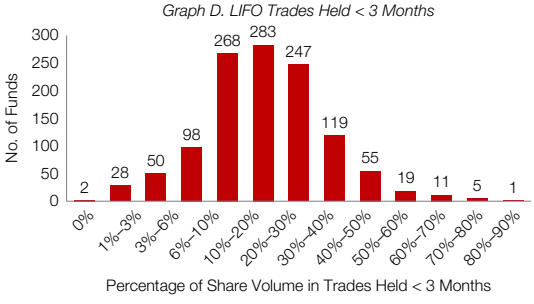


TABLE 3
Trade Returns by Holding Period

Table 3 reports first-in, first-out (FIFO) round-trip trade average returns that are weighted by principal amount (initial share price × number of shares) within each holding period category. Raw return (Panel A) is the percentage price change over the holding period; and DGTW-adjusted return (Panel B) subtracts the DGTW (1997) benchmark return over the identical holding period from the raw return for each round-trip trade. Institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years. * and ** indicate significance at the 5% and 1% levels, respectively.

Holding Period			Fund-Level Trade Returns							
			Money Managers				Pension Funds			
					Percentile				Percentile	
At Least	Less Than	Aggregate Trade Returns	Mean	Median	25th	75th	Mean	Median	25th	75th
Panel A. Raw Returns										
1 day	1 week	−1.00**	−0.82**	−0.54**	−1.51	0.36	−1.52**	−0.54**	−4.14	1.94
1 week	1 month	−2.72**	−2.06**	−1.56**	−3.81	−0.44	−3.14**	−2.48**	−7.46	1.29
1 month	2 months	−3.99**	−0.80**	−2.36**	−5.18	0.58	−3.07**	−2.59**	−7.65	2.15
2 months	3 months	−5.22**	−2.64**	−2.94**	−6.59	0.41	−3.37**	−3.41**	−8.82	2.13
3 months	4 months	−4.88**	−3.24**	−3.37**	−6.95	−0.27	−3.12**	−2.82**	−8.86	2.76
4 months	5 months	−5.07**	−2.85**	−3.75**	−6.56	0.13	−2.93**	−2.85**	−9.60	3.40
5 months	6 months	−5.32**	−2.87**	−3.30**	−7.50	0.13	−2.35**	−2.37*	−9.60	4.35
6 months	9 months	−4.79**	−1.89**	−1.94**	−7.51	1.69	−2.11**	−1.48**	−8.52	4.59
9 months	1 year	−4.36**	−2.10**	−1.07**	−7.89	3.20	−0.97**	−0.56**	−8.71	6.81
1 year	2 years	−2.31**	0.14**	0.41	−6.66	7.53	1.27**	1.79**	−7.80	11.07
2 years	3 years	1.46**	3.66**	5.36**	−7.35	14.12	3.19**	4.73**	−9.63	18.42
3 years	4 years	6.71**	5.93**	10.31**	−6.62	24.23	4.06**	6.87**	−12.63	24.84
4 years		11.11**	3.18**	4.59**	−13.92	22.10	6.76**	10.03**	−12.81	31.02
Panel B. DGTW-Adjusted Returns										
1 day	1 week	−0.56**	−0.57**	−0.37**	−1.90	0.28	−1.47	−0.51**	−3.71	1.30
1 week	1 month	−0.99**	−1.40**	−0.89**	−3.46	0.02	−2.30**	−1.56**	−5.61	1.18
1 month	2 months	−1.28**	−1.21**	−1.20**	−4.44	0.22	−2.17**	−1.79**	−5.55	1.30
2 months	3 months	−1.49**	−0.74**	−1.12**	−4.95	0.36	−2.25**	−2.35**	−6.24	1.58
3 months	4 months	−0.96**	−1.07**	−1.07**	−4.94	1.04	−2.48**	−2.47**	−7.06	1.83
4 months	5 months	−0.79**	−0.98**	−1.67**	−3.85	0.71	−1.89**	−2.22**	−6.85	1.94
5 months	6 months	−0.73**	−0.74**	−0.61**	−4.51	1.32	−1.69	−2.15	−6.96	2.69
6 months	9 months	0.26**	−0.31**	−0.02**	−4.35	1.83	−1.64**	−1.25**	−5.86	2.46
9 months	1 year	1.19**	−0.40****	0.30**	−4.76	2.74	0.10**	0.00**	−4.81	4.47
1 year	2 years	2.88**	2.24**	2.66**	−1.72	5.41	1.11**	1.31**	−4.25	5.93
2 years	3 years	2.54**	4.00**	4.40**	−4.82	10.12	3.62**	3.22**	−4.26	10.91
3 years	4 years	3.65**	4.67**	6.31**	−7.22	14.68	6.33**	3.42**	−9.60	16.43
4 years		7.78**	8.79**	6.62**	−17.23	16.51	4.68**	2.64**	−13.26	16.47

returns, yielding 125 portfolios.[10] The returns calculated here should be viewed as the upper limit on a trade's true profit because they are based on transaction prices, which include the cost of the bid–ask spread but exclude explicit transaction costs such as commissions. The column labeled "Aggregate Trade Returns" reports average raw and DGTW-adjusted returns across all trades in each holding period. We also calculate the raw and DGTW-adjusted returns for the trades of each fund in each holding-period category and present the mean and median fund returns for trades in each duration bucket. The last 8 columns of each panel (labeled "Fund-Level Trade Returns") examine the dispersion of trade returns across funds, separately for money managers and pension funds.

Our first question is whether the prevalence of short-duration institutional trades indicates that institutional fund managers are primarily exploiting short-lived information advantages (which could be either fundamental or flow-based).

[10]Details of the DGTW (1997) benchmark are available on Russ Wermers' Web site (http://alex2.umd.edu/wermers/ftpsite/Dgtw/coverpage.htm). We thank Zhi Da for providing the daily equivalents of the DGTW benchmark returns for our sample.

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The aggregate trade returns column in Panel A of Table 3 shows that the average raw return is significantly negative for trades held for less than 2 years and significantly positive for trades held for longer than 2 years.[11] Adjusting returns with the DGTW-based benchmarks (Panel B) also indicates that short-duration trades have significantly negative returns, although here the aggregate returns become significantly positive earlier (at the 6- to 9-month holding period). The fund-level trade return columns echo the conclusions drawn from aggregate returns. The mean and median returns across the short-duration trades of funds are mostly significantly negative for horizons less than a year. In short, Table 3 does not support the hypothesis that short-term trading reflects short-lived information advantages.

These results contrast sharply with those of Puckett and Yan (2011), who find positive returns for intraquarter trades (see their Table 2) and for buys and sells that are marked to market at the end of the quarter (see their Table 3). As we explain in Section II.C, Puckett and Yan's trades are not a subset of ours because of the influence of the queue, but there is certainly a substantial overlap. In work available from the authors, we use the Puckett and Yan method of constructing round-trip trades and contrast it with intraquarter trades as defined by looking at the entire queue (our main method). Focusing on Puckett and Yan's 1999–2005 sample period, we find that their method produces a 3.26% mean return in our sample, of similar magnitude to the 2.99% reported in Table 2 of Puckett and Yan (2011). The correlation of the median returns between our FIFO and Puckett and Yan's is 67%. We would not expect to exactly match their returns because we focus on funds present for 5 or more years and exclude stocks that split. Using the full information in the queue of buys and sells, our intraquarter round-trip trades average −1.94% for FIFO and −0.24% for LIFO over the same 1999–2005 period, with both averages significantly different from 0. Thus, the general conclusion of Puckett and Yan (2011) that managers have informed trades that are hidden from 13F filings (i.e., within calendar quarters) is supported. What is not valid is a broader conclusion that institutional short-term trading produces positive returns on average.[12]

Our results are consistent with recent evidence on fund returns. Using bootstrap methods, Kosowski, Timmerman, Wermers, and White (2006) conclude that there is statistically significant evidence of information advantages for only a small group of mutual funds, whereas Fama and French (2010) conclude there is no such evidence. For managers of funds with institutional clients such as pension funds, Busse et al. (2010) conclude that there is only weak evidence of informational advantages. At a minimum, it appears that information advantages are rare enough that they are unlikely to explain the majority of short-term trades.

[11] The aggregate return of −3.91% quoted in the abstract is calculated by principal-weighting the returns from the first 4 holding-period categories: 6% of the under-3-month trades are held for 1 day to 1 week, 25% are held for 1 week to 1 month, 35% are held for 1–2 months, and 34% are held for 2–3 months.

[12] Puckett and Yan (2011) are careful to conclude that their findings apply only to their definitions of intraquarter round-trip trades. Other papers are not as careful. For example, Griffin, Shu, and Topaloglu ((2012), p. 28) state, "Puckett and Yan (2011) find that short-term institutional trading earns abnormal returns."

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IV. Which Short-Term Trades Lose Money?

A natural question is whether the loss-making short-term trades have certain characteristics in common. For example, are the losses concentrated in a certain type of stocks or during particularly volatile markets, or do they occur mostly in funds that do a lot of trading? To shed some light on these questions, we perform portfolio sorts on stock and fund characteristics. Our sorting variables include stock beta (from CRSP), size (market capitalization from CRSP), illiquidity (using the illiquidity measure from Amihud (2002)), book-to-market ratio (from CRSP and Compustat), momentum (calculated using a 12-month lookback window, as in Asness, Moskowitz, and Pedersen (2013)), and market volatility (calculated as monthly volatility of Standard & Poor's (S&P) 500 index). At the fund level, we sort on the average annual percentage of dollar volume that is in trades held for less than 3 months, the average annual dollar volume of all round-trip trades, and the average size of trades held for less than 3 months. The latter two sorts are proxies for fund size, which we cannot measure directly because our data set contains no information on fund holdings; the Ancerno database contains transactions only. Quintile rankings are determined annually across all stocks or funds with short-term trades in that year. Table 4 presents the returns results adjusted per DGTW (1997) for sorts at the stock level (Panel A) and the fund level (Panel B).

Looking first at Panel A of Table 4, the sorts on stock characteristics show that the poor performance of short-term trades occurs in most stock categories. Returns are lowest in the smallest stocks (Size quintile 1), where information asymmetry is likely to be greatest. Returns are also lower for stocks in the highest book-to-market quintile, that is, value stocks (Book/Market quintile 5), which is not surprising given the consistent finding that value portfolios earn higher returns over horizons of 2–3 years (e.g., Asness et al. (2013)). Our finding that short-duration trades of stocks in the lowest-momentum quintile have very negative DGTW (1997) returns (−6.25%) is consistent with prior research. The stocks in Q1 are exactly the stocks that should be sold short, but these institutional trades are long. It is worth noting that the stocks in Q5 are the stocks typically bought in momentum portfolios. Q5 shows the largest positive number in the table and is roughly the magnitude found in momentum studies (e.g., Asness et al. (2013)). Short-duration trade returns are also significantly lower during times of high market volatility, which may reflect both the higher implicit cost of trading during volatile times and a higher likelihood of managers closing out positions for behavioral reasons during volatile times. Returns on short-term trades do not appear to vary monotonically with stock betas or stock illiquidity.

Panel B of Table 4 analyzes money manager and pension funds separately because they may have different horizons and motivations. Among pension funds, funds that have the highest percentage of short-term trades tend to have the lowest short-term trade returns. Thus, the percentage of short-duration trades across funds seems to be inversely correlated with expertise in short-term trading. Funds with the largest amount of trading per year and largest average trade sizes, 2 proxies for fund size, also tend to have the lowest returns on short-term trades, suggesting that bigger funds do not exhibit more skill (and even exhibit significantly less

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TABLE 4

Short-Duration Trade Returns by Stock, Market, and Fund Characteristics

In columns 1–5 of Panel A in Table 4, short-term trades are sorted by stock characteristics, with quintile rankings determined annually across all stocks with short-term trades in that year. In column 6 of Panel A, short-term trades are sorted into quintiles based on the volatility of the Standard & Poor's (S&P) 500 index in the month the trade is closed out. In Panel B, funds are sorted into quintiles based on their average annual percentage of short-term trades (columns 1 and 2), average annual dollar volume of round-trip trades (columns 3 and 4), and average size of short-term trades (columns 5 and 6). Average returns adjusted per DGTW (1997) for each fund's short-term trades are weighted across trades by principal amount (initial share price × number of shares). Numbers in parentheses are *t*-statistics, which are computed based on double-clustered standard errors in Panel A. Institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years. Analysis is run separately for money manager funds and for pension funds, and short-term trades are defined as first-in, first-out (FIFO) round-trip trades held for less than 3 months.

Panel A. Sorts by Stock and Market Characteristics

	Beta	Size	Amihud Illiquidity	Book-to-Market	Momentum	Market Volatility
Quintile	1	2	3	4	5	6
Q1	0.02	−6.71	−1.45	0.26	−6.25	−0.53
	(0.0)	(−3.5)	(−2.2)	(0.4)	(−3.6)	(−2.0)
Q2	−1.08	−3.19	−0.28	−0.07	−1.89	−0.73
	(−2.1)	(−3.9)	(−0.7)	(−0.2)	(−2.2)	(−1.2)
Q3	−0.39	−1.26	−1.33	−1.46	−0.58	−1.45
	(−1.4)	(−2.9)	(−4.0)	(−2.4)	(−1.9)	(−1.5)
Q4	−1.71	−0.80	−2.47	−3.08	−0.17	−1.10
	(−2.0)	(−1.5)	(−2.4)	(−4.4)	(−0.5)	(−1.3)
Q5	−2.19	−1.15	−0.10	−7.06	0.87	−2.24
	(−1.7)	(−1.8)	(−0.1)	(−3.3)	(1.1)	(−2.7)
Q5−Q1	−2.21	5.56	1.35	−7.33	7.12	−1.71
	(−1.1)	(3.6)	(2.3)	(−4.0)	(4.1)	(−2.0)

Panel B. Sorts by Fund Characteristics

	% Short-Term Trades		Amount of Trading		Average Trade Size	
	Money Managers	Pension Funds	Money Managers	Pension Funds	Money Managers	Pension Funds
Quintile	1	2	3	4	5	6
Q1	−1.18	−0.16	−0.29	−1.40	1.11	−1.07
	(−1.7)	(−0.2)	(−0.2)	(−1.5)	(0.7)	(−1.6)
Q2	0.65	−1.47	−0.27	−1.81	−0.78	−2.30
	(0.4)	(−2.5)	(−0.3)	(−3.5)	(−1.5)	(−4.3)
Q3	−1.77	−2.26	−1.35	−1.77	−2.11	−2.49
	(−2.1)	(−4.9)	(−2.1)	(−3.6)	(−3.3)	(−5.3)
Q4	−1.17	−2.89	−1.61	−2.32	−1.37	−1.81
	(−3.7)	(−7.4)	(−4.9)	(−6.0)	(−2.6)	(−3.5)
Q5	−1.38	−3.51	−1.28	−3.06	−1.57	−2.73
	(−2.8)	(−7.9)	(−2.7)	(−8.9)	(−2.4)	(−4.8)
Q5−Q1	−0.20	−3.36	−0.99	−1.66	−2.68	−1.66
	(−0.2)	(−3.8)	(−0.6)	(−1.8)	(−1.6)	(−1.9)

skill) short-term trading. The differences across money manager funds are generally not significant, perhaps because there are only 84 money manager funds in our sample, limiting our ability to detect statistically significant differences across fund quintiles.

Overall, the picture that emerges is that the poor returns on short-duration institutional trades are not confined to a particular subset of stocks or type of funds. Nonetheless, some funds do earn positive returns on short-duration trades (e.g., in Table 3, the 75th percentile is positive in almost all short-term holding periods), which could be due to trading skill not correlated with the dimensions captured in Table 4 or simply luck. To examine the extent to which fund manager

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skill can explain the fund-level results, we next examine the persistence of funds' short-duration trade performance.

Table 5 presents the results of tests for return persistence for short-duration trades at the fund level. In each semiannual period, we sort funds into quintiles based on their performance for trades held for less than 3 months. Note that the returns reported are for a particular category of trades within each fund, not for the fund's overall performance.[13] We report the average return adjusted per DGTW (1997) for funds in each quintile in the base semiannual period (when the funds are assigned to quintiles) and in the 4 subsequent semiannual periods. For example, Panel B shows that the best-performing quintile of pension funds in short-term trades earned an average of 14.17% in the base period (Panel B, Base Period column, Q5 row), and the worst-performing quintile of funds earned an average of −18.81% (Panel B, Base Period column, Q1 row). The difference of 32.98%

TABLE 5

Short-Duration Trade Return Persistence at the Fund Level

In Table 5, funds are sorted into quintiles based on the average returns on their under-3-month first-in, first-out (FIFO) round-trip trades in each semiannual period, and the average fund returns (in %) for each quintile are reported in the quintile formation period ("Base Period") and the subsequent 4 semiannual periods ("Base+1," "Base+2," "Base+3," and "Base+4"). Average returns adjusted per DGTW (1997) for each fund's under-3-month round-trip trades are weighted across trades by principal amount (initial share price × number of shares). Numbers in parentheses are *t*-statistics, which are computed based on double-clustered standard errors. The institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years. Analysis is run separately for money manager funds and for pension funds.

	Semiannual Periods				
Quintile	Base Period	Base+1	Base+2	Base+3	Base+4
Panel A. Money Managers					
Q1	−15.96	−2.86	−3.74	−0.28	−1.65
	(−10.3)	(−2.5)	(−2.2)	(−0.2)	(−0.9)
Q2	−5.07	−1.65	−1.64	−1.84	−0.57
	(−8.6)	(−2.4)	(−1.4)	(−2.8)	(−0.6)
Q3	−1.58	−0.99	−1.13	−1.68	−0.97
	(−4.4)	(−1.9)	(−2.4)	(−2.6)	(−1.9)
Q4	1.56	−0.11	−0.86	−0.41	−1.09
	(3.6)	(−0.3)	(−1.5)	(−0.7)	(−1.5)
Q5	9.78	0.39	1.96	0.78	0.02
	(11.6)	(0.3)	(2.1)	(0.8)	(0.0)
Q5−Q1	25.74	3.25	5.70	1.06	1.68
	(13.2)	(2.1)	(2.8)	(0.5)	(0.8)
Panel B. Pension Funds					
Q1	−18.81	−4.99	−5.18	−5.02	−4.14
	(−13.7)	(−6.9)	(−6.4)	(−5.5)	(−5.1)
Q2	−6.11	−3.15	−3.44	−3.48	−3.52
	(−10.9)	(−4.9)	(−5.4)	(−5.5)	(−5.7)
Q3	−1.92	−3.06	−2.20	−2.39	−2.62
	(−5.4)	(−5.6)	(−4.1)	(−4.2)	(−4.2)
Q4	1.64	−1.46	−1.41	−1.97	−2.05
	(5.9)	(−3.2)	(−2.2)	(−3.2)	(−3.9)
Q5	14.17	0.19	−1.03	−0.35	−0.38
	(15.4)	(0.3)	(−1.5)	(−0.4)	(−0.5)
Q5−Q1	32.98	5.18	4.14	4.67	3.76
	(17.0)	(7.7)	(7.5)	(5.4)	(5.1)

[13]Because we do not have information about a fund's holdings, only its transactions, we cannot calculate a fund's overall performance.

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between the best and worst-performing quintiles is statistically significant, with a t-statistic of 17.0. Statistical significance in all of our tests is based on standard errors that are double-clustered on fund and semiannual period (see the Internet Appendix for details). Although the differences are smaller in subsequent semiannual periods, they are statistically significant. However, the performance difference between Q1 and Q5 is driven mainly by the significant underperformance of the funds in Q1 in all periods subsequent to portfolio formation. Those pension funds with the least skill in trades held for less than 3 months continue to exhibit poor returns in the subsequent four semiannual periods, a pattern that is repeated for money managers (Panel A) but with reduced magnitudes.[14] In summary, the return persistence results do not appear to be driven by information advantages even for those funds that earn the highest returns.

V. Why Do Short-Term Trades Lose Money?

In this section, we investigate several possible explanations for the widespread low returns on short-duration trades, in an attempt to understand why fund managers engage in trades that appear to persistently lead to losses. These include the disposition effect (Shefrin and Statman (1985)), loss-cutting, recency bias (Tversky and Kahneman (1973)), overconfidence (Gervais and Odean (2001)), and trading to look active (Dow and Gorton (1997)). Although many of these behavioral biases have been documented for individual investors, Frazzini (2005) finds evidence that mutual fund managers are also subject to the disposition effect, suggesting that fund managers may suffer from behavioral biases as well.

A. Disposition Effect

The disposition effect predicts that fund managers sell winners and hold on to losers, which would result in higher returns for shorter-duration trades and lower (or negative) returns on longer-duration trades. The pattern of returns by trade holding period in Table 3 reveals no evidence of the disposition effect, as managers do not appear to sell winners and hold on to losers, at least if we assume that the purchase price is the reference price. But our results are consistent with Ben-David and Hirshleifer's (2012) finding that, contrary to the standard predictions of the disposition effect, at short holding periods, individual investors are more likely to sell stocks with big losses than those with small losses.

B. Loss-Cutting

One plausible explanation for negative returns on short-term trades is that fund managers unwind loss-making trades early because they receive new information suggesting that the trades will be even more unprofitable over the longer term, so they "cut their losses." To examine this possibility, in Table 5 we perform the following simulation. For each trade that is held for less than 3 months, we calculate what its return would have been if it had been held for the rest of a full year (where average fund-level returns turn positive in Table 3). For example, if a trade

[14]The weaker significance for money managers may in part reflect the small number of money managers in the sample: 84 money managers versus 1,102 pension funds.

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was initiated on Mar. 15, 2006, and closed out on Apr. 1, 2006, we calculate its hypothetical "what-if" return if it had been held from Apr. 1, 2006 to Mar. 15, 2007.

The results in Panel A of Table 6 show that in aggregate and at the fund level, the mean and median trades that were actually held for less than 3 months would have produced a positive raw return had they been held for the remainder of a year. A similar picture emerges in Panel B, where the returns adjusted per DGTW (1997) for the what-if trades are generally positive or near 0. This suggests that the negative returns earned on short-duration trades are not explained by fund managers cutting their losses in light of new information received shortly after they initiate trades.

C. Recency Bias

The combination of negative short-term returns followed by higher returns if the trades had been held longer is consistent with managers demonstrating recency bias. Recency bias is the heuristic in which a person evaluates the probability of events by the ease with which relevant instances come to mind. It creates a tendency to overemphasize recent events, for example, a recent return of large magnitude, and has been found to influence stock selection for retail investors (Nofsinger and Varma (2013), Shefrin (2007)). Using the heuristic, when a manager observes a sharp fall in stock price shortly after buying a stock, the manager tends to overreact and close out the position, or in practitioner vernacular, "abandon his or her thesis," leading to a short-duration trade at a loss (as in Table 3), although the position would have produced a positive return if it had been held

TABLE 6

Trade Returns by Holding Period If Trades Had Been Held for 1 Year Instead of Less Than 3 Months

Table 6 reports round-trip trade average "what-if" raw returns that are weighted by principal amount (initial share price × number of shares) within each holding-period category. Raw return (Panel A) is the percentage price change over the holding period; DGTW-adjusted return (Panel B) subtracts the DGTW (1997) benchmark return over the identical holding period from the raw return for each round-trip trade. Institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years. For each actual trade in the database that was held for less than 3 months under the first-in, first-out (FIFO) method, we calculate the "what-if" 1-year return as the return the trade would have earned if it had been held for the remainder of a full year instead of closed within 3 months (e.g., the return that would have been earned if a 1-week trade had been held for the subsequent 51 weeks). * and ** indicate significance at the 5% and 1% levels, respectively.

Actual Holding Period		Aggregate 1-Year "What-If" Trade Returns	Fund-Level 1-Year "What-If" Trade Returns							
			Money Managers				Pension Funds			
					Percentile				Percentile	
At Least	Less Than		Mean	Median	25th	75th	Mean	Median	25th	75th
Panel A. Raw Returns on Trades Held for Less Than 3 Months If They Had Been Held for 1 Year										
1 day	1 week	35.11**	16.18**	12.94**	2.79	24.26	8.81**	3.89**	−10.22	18.80
1 week	1 months	33.76**	33.29**	11.55**	6.01	23.60	16.34**	6.65*	−2.55	18.49
1 month	2 months	61.86**	39.64**	21.56**	7.09	45.14	16.56**	4.69**	−5.82	20.40
2 months	3 months	37.30**	19.13**	8.96**	1.38	24.01	22.51**	4.06**	−5.27	19.00
Panel B. DGTW-Adjusted Returns on Trades Held for Less Than 3 Months If They Had Been Held for 1 Year										
1 day	1 week	0.01**	−0.42**	−0.07**	−3.03	1.95	0.15	−0.05**	−9.44	8.36
1 week	1 month	0.70**	0.05**	0.45**	−1.38	2.70	1.84**	0.91**	−3.86	6.11
1 month	2 months	1.15**	0.52**	0.58**	−1.26	3.08	1.53**	1.21**	−2.97	5.84
2 months	3 months	3.39**	1.59**	0.78**	−1.10	4.34	2.02**	0.98**	−2.82	5.60

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longer (as shown by the what-if trade returns in Table 5).[15] Ideally, a test for recency bias would examine a fund's entire holdings to determine whether funds are more likely to close out trades after observing adverse price moves; unfortunately, the Ancerno data set contains only funds' transactions, not their entire holdings, so such an analysis is not possible in our sample. However, the pattern of returns in Table 4 is consistent with recency bias. Institutions appear to be selling value stocks too soon and going long stocks that are typically shorted in momentum portfolios. This suggests an opportunity for further research using both portfolio holdings and trade horizons.

D. Overconfidence

To explicitly test for overconfidence, we examine the link between returns and subsequent short-duration trading activity. When combined with attribution bias, overconfidence predicts that following a period of high realized returns, investors mistakenly attribute the returns to their own skill and, as a consequence, tend to trade more in subsequent periods. The reverse should occur for low returns.

In Table 7 we sort funds into quintiles based on their short-duration trade returns in the base period (as in Table 5), and we report the average percentage of short-duration trading (rather than the trade returns) in the base period and each subsequent period. In most cases, the amount of short-duration trading is not higher in subsequent periods for funds with the highest base-period returns (quintile 5) than for funds with the lowest base-period returns (quintile 1). Comparing Q5 and Q1, we find that for both money managers and pension funds, the difference in short-duration trading is statistically insignificant for most periods subsequent to portfolio formation.[16] Indeed, the few significant differences show more short-term trading for funds with the lowest short-term trade returns, the opposite of what would be expected from overconfident managers who mistakenly attribute performance to their skill. Overall, the picture that emerges suggests that whatever overconfidence fund managers may be exhibiting is not directly related to attribution bias.[17]

E. Trading to Look Active

Trading simply to show that a portfolio manager is active, as modeled by Dow and Gorton (1997), should lead to more short-duration trades with low returns, as they are undertaken to justify their management fees rather than to maximize returns. At a minimum, such trades would be expected to lose the bid–ask

[15] Reconstructing the "what-if" returns of Table 5 by including the initial holding period in the 1-year returns, that is, by beginning the simulated returns from the initiation date of the trade, produces returns that are (not surprisingly) very close to those of adding the negative returns of Table 3 to the positive returns of Table 5.

[16] Statistical significance in all of our tests is based on standard errors that are double-clustered on fund and semiannual period (see the Internet Appendix for details).

[17] Other aspects of overconfidence are still possible. For example, Moore and Healy (2008) define three dimensions of overconfidence: i) overestimation is the biased estimation of the chance of success, ii) overprecision is excessive certainty about the accuracy of one's beliefs, and iii) overplacement is when people believe they are better than others. Our results suggest that overestimation and overprecision based on previous returns do not occur in these trades, but overplacement is still a possibility.

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TABLE 7

Short-Duration Trading Amount Following Returns

In Table 7, funds are sorted into quintiles based on the average returns adjusted per DGTW (1997) on under-3-month first-in, first-out (FIFO) round-trip trades in each semiannual period, and the average percentages of share volume that occurs in short-duration trades (in %) for each quintile are reported in the quintile formation period ("Base Period") and the subsequent 4 semiannual periods ("Base+1," "Base+2," "Base+3," and "Base+4"). Numbers in parentheses are *t*-statistics, which are computed based on double-clustered standard errors. The institutional trading data are from Ancerno Ltd. for trades executed between Jan. 1, 1999, and Dec. 31, 2009, by funds in the database for 5 or more years. Analysis is run separately for money manager funds and for pension funds.

	Semiannual Periods				
Quintile	Base Period	Base+1	Base+2	Base+3	Base+4
Panel A. Money Managers					
Q1	14.78	15.71	19.81	19.43	24.75
	(5.2)	(4.1)	(6.3)	(4.6)	(3.5)
Q2	17.00	18.77	20.24	23.28	23.99
	(7.7)	(8.9)	(4.9)	(5.7)	(6.9)
Q3	20.40	20.78	21.53	22.04	22.37
	(8.7)	(6.3)	(6.9)	(6.0)	(5.4)
Q4	22.03	20.69	19.35	18.15	19.47
	(5.3)	(5.7)	(5.1)	(5.6)	(4.7)
Q5	17.51	16.79	15.75	17.23	17.07
	(8.0)	(6.4)	(5.5)	(4.7)	(6.2)
Q5−Q1	2.72	1.08	−4.06	−2.20	−7.68
	(1.5)	(0.5)	(−2.2)	(−1.1)	(−1.5)
Panel B. Pension Funds					
Q1	16.33	18.45	19.61	19.86	20.49
	(11.8)	(10.8)	(12.3)	(10.9)	(10.4)
Q2	20.08	20.28	21.09	22.09	23.18
	(14.4)	(12.8)	(13.1)	(13.3)	(12.0)
Q3	21.90	20.59	20.86	21.45	22.03
	(15.1)	(14.5)	(13.2)	(12.2)	(13.0)
Q4	20.84	19.50	20.59	20.79	23.43
	(14.5)	(13.8)	(11.4)	(11.3)	(10.6)
Q5	15.68	17.51	17.50	19.35	19.82
	(9.3)	(11.1)	(9.8)	(8.8)	(9.8)
Q5−Q1	−0.65	−0.94	−2.10	−0.51	−0.68
	(−0.7)	(−1.1)	(−2.6)	(−0.4)	(−0.7)

spread, but given their lack of information, they may also lose a great deal more (e.g., if they inadvertently trade against better-informed investors). Our findings of widespread losses in short-term trades are consistent with fund managers trading simply to look active. That pension funds have lower mean and median fund returns on short-duration trades than money managers suggests that trading to look active may be a larger problem for pension funds, perhaps because the nature of their contracts encourages them to trade more actively just to show they are doing something (Lakonishok et al. (1992)).

In summary, the losses on short-term trades appear most consistent with managers trading to look active or suffering from recency bias, which causes them to overweight recent adverse price moves in their trading decisions. We find no evidence of the disposition effect, loss-cutting, or overconfidence related to attribution bias.

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VI. Robustness Checks

Results for the full sample of funds in the Ancerno universe (4,053 funds) are qualitatively similar to those presented in the paper (which are based on the 1,186 funds present for 5 or more years), with the exception that the full sample implies that a larger proportion of trades are short duration, a mechanical result because funds that are present for only a short period of time can contribute only short-duration trades. All of our findings are qualitatively similar when we use 1 month instead of 3 months as the cutoff for our definition of short-duration trades. Results are not driven by the financial crisis of 2008; all results are qualitatively similar when 2008 is dropped from the sample period. Alternative measures of market-wide volatility including the VIX index and range-based measures of S&P 500 index volatility yield qualitatively similar results. Using the Fong, Holden, and Trzcinka (2014) measure of illiquidity suggests that short-term trades in the most illiquid stocks have significantly lower returns. A multivariate regression of short-duration trade returns adjusted per DGTW (1997) on stock and fund characteristics provides similar inferences to those provided by the univariate tests in Table 4. As an alternative to DGTW (1997) adjustments, we also replicate our analyses with market-adjusted returns, defined as raw returns minus returns on the S&P 500 index over the identical holding period for each trade. All of our conclusions hold.

We also investigate whether cross-trading (internalization) among funds of the same institution may explain our results. Chaudhuri, Ivkovic, and Trzcinka (2014) find evidence that institutions cross-trade in order to benefit one fund at the expense of another, behavior about which the Pension and Welfare Benefits Administration of the U.S. Department of Labor has expressed serious concern (U.S. Department of Labor (1998)). We identify potential cross-trades when the same stock is bought by one fund and sold by another fund belonging to the same institution, at the same price on the same day. Potential cross-trades account for less than 0.001% of the total share volume in our sample, and excluding them from our analyses does not change our results.

VII. Conclusion

This is the first study to document that the majority of short-duration institutional trades lose money, using a large database of institutional trades. We examine a wide range of actual trade holding periods of institutional investors, from 1-day trades to those held for multiple years, using the entire available history of an institution's trading. Analyzing the daily U.S. equity trades of 1,186 institutional funds present in the Ancerno database for at least 5 years, we identify the holding periods and returns of over 105 million round-trip trades between 1999 and 2009, with a total volume of over 291 billion shares. We find that short-duration trades are common in institutional portfolios. In aggregate, over 23% of volume occurs in trades that are held for less than 3 months. Within the less-than-3-month category are a significant number of trades that are held for less than a month and even less than a week. The prevalence of short-duration trades appears surprising in light of the typically low turnover rates for mutual funds and pension funds.

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The average returns for trades held for 9 months or less are overwhelmingly negative, with the lowest returns occurring in small stocks, value stocks, and low-momentum stocks. Short-duration trade returns are also lower when the market is more volatile. At the fund level, funds that do the most short-duration trading also have the lowest short-duration trade returns, and we find no evidence of persistent skill in short-duration trades.

The negative returns on short-duration trades do not appear to be due to loss-cutting when managers receive new information after initiating a trade, because the returns would have been positive on average if managers had held the positions for a year. That short-term trades have negative returns on average rules out the disposition effect. We show that the relatively few successful short-term trades do not lead to more short-term trading in the same fund, which rules out overconfidence based on attribution bias. Short-duration trades may be driven by recency bias, with managers selling after a sharp adverse price move. In the practitioner vernacular, the manager "abandons his or her thesis" when the stock price goes against the manager's trade. Our results are also consistent with the agency problem that arises when clients cannot distinguish when a manager is "actively doing nothing" versus "simply doing nothing." By trading when they have no particular information, fund managers expose themselves to losses both from the bid–ask spread and from possible adverse selection if they trade with better-informed traders.

This study presents a richer picture of institutional trading decisions, providing insight into the many findings in the literature that are based on characterizing institutions as short term versus long term. By looking at precise trades rather than net changes in quarterly portfolio holdings, we are able to reveal the true short-term trading activity of institutions, which can be masked by using "churn rates." From this microfoundation, it is easier to understand why the presence of short-term institutions (defined as institutions that engage in more short-term trades) is found to be associated with temporary price distortions and return anomalies.

Our results demonstrate that the conclusions based on statistics derived from 13F filings are generally supported by trading data. To be clear, we cannot identify the fund, so we cannot characterize a fund as "short term" or "long term" and directly link the statistics used by other authors to holding periods. But our finding that trades held for up to 9 months are generally not based on information is consistent with papers arguing that short-term institutional trades do not reflect fundamental information.

References

Amihud, Y. "Illiquidity and Stock Returns: Cross Section and Time-Series Effects." *Journal of Financial Markets*, 5 (2002), 31–56.

Anand, A.; P. Irvine; A. Puckett; and K. Venkataraman. "Institutional Trading and Stock Resiliency: Evidence from the 2007–2009 Financial Crisis." *Journal of Financial Economics*, 108 (2013), 773–797.

Asness, C. S.; T. J. Moskowitz; and L. H. Pedersen. "Value and Momentum Everywhere." *Journal of Finance*, 68 (2013), 929–985.

Ben-David, I., and D. Hirshleifer. "Are Investors Really Reluctant to Realize Their Losses? Trading Responses to Past Returns and the Disposition Effect." *Review of Financial Studies*, 25 (2012), 2485–2532.

https://doi.org/10.1017/S0022109017000400 Published online by Cambridge University Press

Berk, J. B., and J. H. van Binsbergen. "Measuring Skill in the Mutual Fund Industry." *Journal of Financial Economics*, 118 (2015), 1–20.
Boehmer, E., and E. Kelley. "Institutional Investors and the Informational Efficiency of Prices." *Review of Financial Studies*, 22 (2009), 3563–3594.
Bushee, B. J. "Do Institutional Investors Prefer Near-Term Earnings over Long-Run Value?" *Contemporary Accounting Research*, 18 (2001), 207–246.
Bushee, B. J., and C. F. Noe. "Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility." *Journal of Accounting Research*, 38 (2000), 171–202.
Busse, J.; A. Goyal; and S. Wahal. "Performance and Persistence in Institutional Investment Management." *Journal of Finance*, 65 (2010), 765–790.
Cella, C.; A. Ellul; and M. Giannetti. "Investors' Horizons and the Amplification of Market Shocks." *Review of Financial Studies*, 26 (2013), 1607–1648.
Chaudhuri, R.; Z. Ivkovic; and C. Trzcinka. "Strategic Performance Allocation in Institutional Asset Management Firms: Behold the Power of Stars and Dominant Clients." *Review of Financial Studies*, forthcoming (2017).
Chordia, T.; R. Roll; and A. Subrahmanyam. "Recent Trends in Trading Activity and Market Quality." *Journal of Financial Economics*, 101 (2011), 243–263.
Chung, K. H., and H. Zhang. "Corporate Governance and Institutional Ownership." *Journal of Financial and Quantitative Analysis*, 46 (2011), 247–273.
Coval, J., and T. Moskowitz. "Home Bias at Home: Local Equity Preference in Domestic Portfolios." *Journal of Finance*, 54 (1999), 2045–2073.
Cremers, M., and A. Pareek. "Patient Capital Outperformance: The Investment Skill of High Active Share Managers Who Trade Infrequently." *Journal of Financial Economics*, 122 (2016), 288–306.
Cremers, M.; A. Pareek; and Z. Sautner. "Stock Duration, Analyst Recommendations, and Misevaluation." Working Paper, University of Notre Dame (2014).
Daniel, K.; M. Grinblatt; S. Titman; and R. Wermers. "Measuring Mutual Fund Performance with Characteristic-Based Benchmarks." *Journal of Finance*, 52 (1997), 1035–1058.
Dow, J., and G. Gorton. "Noise Trading, Delegated Portfolio Management, and Economic Welfare." *Journal of Political Economy*, 105 (1997), 1024–1050.
Fama, E., and K. French. "Luck versus Skill in the Cross Section of Mutual Fund α Estimates." *Journal of Finance*, 65 (2010), 1915–1947.
Ferreira, M., and P. Matos. "The Colors of Investors' Money: The Role of Institutional Investors around the World." *Journal of Financial Economics*, 88 (2008), 499–533.
Fong, K.; C. W. Holden; and C. A. Trzcinka. "What Are the Best Liquidity Proxies for Global Research?" Working Paper, Indiana University (2014).
Frazzini, A. "The Disposition Effect and Underreaction to News." *Journal of Finance*, 61 (2005), 2017–2046.
Gaspar, J.; M. Massa; and P. Matos. "Shareholder Investment Horizons and the Market for Corporate Control." *Journal of Financial Economics*, 76 (2005), 135–165.
Gervais, S., and T. Odean. "Learning To Be Overconfident." *Review of Financial Studies*, 14 (2001), 1–27.
Goldstein, M. A.; P. Irvine; E. Kandel; and Z. Wiener. "Brokerage Commissions and Institutional Trading Patterns." *Review of Financial Studies*, 22 (2009), 5175–5212.
Griffin, J. M.; T. Shu; and S. Topaloglu. "Examining the Dark Side of Financial Markets: Do Institutions Trade on Information from Investment Bank Connections?" *Review of Financial Studies*, 25 (2012), 2155–2188.
Hu, G.; R. D. McLean; J. Pontiff; and Q. Wang. "The Year-End Trading Activities of Institutional Investors: Evidence from Daily Trades." *Review of Financial Studies*, 27 (2014), 3133–3170.
Hvidkjaer, S. "Small Trades and the Cross-Section of Stock Returns." *Review of Financial Studies*, 21 (2008), 1123–1151.
Investment Management Association. *Understanding Equity Turnover Data: Initial Findings from IMA Research Submitted to the Kay Review*. London, UK: Investment Management Association (2011).
Kosowski, R.; A. Timmerman; R. Wermers; and H. White. "Can Mutual Fund 'Stars' Really Pick Stocks? New Evidence from a Bootstrap Analysis." *Journal of Finance*, 61 (2006), 2551–2595.
Lakonishok, J.; A. Shleifer; and R. Vishny. "The Structure and Performance of the Money Management Industry." *Brookings Papers: Microeconomics*, (1992), 339–391.
Lewellen, J. "Institutional Investors and the Limits of Arbitrage." *Journal of Financial Economics*, 102 (2011), 62–80.
Ma, L.; Y. Tang; and J. Gomez. "Portfolio Manager Compensation and Mutual Fund Performance." Working Paper, Northeastern University (2015).

https://doi.org/10.1017/S0022109017000400 Published online by Cambridge University Press

Moore, D. A., and J. Healy. "The Trouble with Overconfidence." *Psychological Review*, 115 (2008), 502–517.
Nofsinger, J., and A. Varma. "Availability, Recency and Sophistication in the Repurchasing Behavior of Retail Investors." *Journal of Banking and Finance*, 37 (2013), 2572–2585.
Puckett, A., and X. Yan. "The Interim Trading Skills of Institutional Investors." *Journal of Finance*, 66 (2011), 601–633.
Shefrin, H. "Behavioral Finance: Biases, Mean-Variance Returns, and Risk Premiums." *CFA Institute Conference Proceedings Quarterly*, 31 (2007), 4–12.
Shefrin, H., and M. Statman. "The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence." *Journal of Finance*, 40 (1985), 777–791.
Tversky, A., and D. Kahneman. "Availability: A Heuristic for Judging Frequency and Probability." *Cognitive Psychology*, 5 (1973), 207–232.
U.S. Department of Labor. "Cross-Trades of Securities by Investment Managers." *Federal Register Notice*, 63 (1998), 13696–13701.
Wang, Z. J., and V. Nanda. "Payout Policies and Closed-End Fund Discounts: Signaling, Agency Costs, and the Role of Institutional Investors." *Journal of Financial Intermediation*, 20 (2011), 589–619.

https://doi.org/10.1017/S0022109017000400 Published online by Cambridge University Press