The Interim Trading Skills of Institutional Investors

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Abstract

Using a large proprietary database of institutional trades for the period 1999-2005, this paper examines the interim (i.e., intra-quarter) trading skills of institutional investors. We find strong evidence that institutional investors earn significant abnormal returns on their intra-quarter round-trip trades. Furthermore, the stocks institutions buy significantly outperform the stocks institutions sell within the quarter, suggesting that these institutions have superior skills in timing their trades. More importantly, these interim trading skills are persistent, and the persistence is driven primarily by skilled portfolio managers as opposed to unskilled managers. Our study complements prior studies that use quarterly institutional holdings data, while suggesting that these studies have likely understated the investment skills of institutional investors.

I. Introduction

Do institutional investors have superior stock-picking skills? This question has attracted considerable attention during the last four decades. Financial Economists often refer to institutional investors as "informed" traders, and individuals attempting to trade in the same markets as institutions are likened to "tourists playing poker with professionals in the smoky backroom of a Las Vegas casino."[1] In spite of this conventional wisdom, empirical evidence on institutional investors' ability to earn positive abnormal returns is mixed. Jensen (1968), Gruber (1996), Carhart (1997), and Wermers (2000) find that actively managed mutual funds, on average, underperform passive benchmarks after fees. Alternatively, studies by Hendricks, Patel, and Zeckhauser (1993), Brown and Goetzman (1995), and Elton, Gruber, and Blake (1996) find evidence of persistence in relative mutual fund performance, suggesting that at least some portfolio managers are skilled. However, Carhart (1997) finds this persistence is an artifact of the momentum effect documented by Jegadeesh and Titman (1993).[2] Findings that professional managers possess little, if any, investment skills are economically troubling since portfolio managers are highly compensated by the market.

Portfolio returns are a potentially noisy measure of stock-picking skills since they include both trading costs and the returns of non-stock holdings such as cash and bonds. Examining the stockholdings and particularly the trades of institutional investors can provide more powerful tests regarding stock-picking skills (Chen, Jegadeesh, and Wermers, 2000). In particular, stock trades are more likely to reflect portfolio manager stock-picking skills than passive decisions to hold stocks already in the portfolio, since the latter may be unrelated to portfolio managers'

[1] Excerpt taken from "Individual Investors see Red, Prof. Terry Odean Finds", June 5, 2007, Hass Newsroom.
[2] Bollen and Busse (2004) and Busse, Goyal, and Wahal (2007) find evidence of performance persistence even after controlling for momentum. Using a bootstrap approach, Kosowski, Timmermann, Wermers, and White (2006) find evidence that a small fraction of mutual fund managers are skilled and their superior performance persists.

private beliefs about future returns.[3] Unfortunately, prior studies using quarterly institutional holdings and/or changes in these holdings continue to find mixed evidence concerning the stock-picking skill of institutional investors.[4] Using 13F institutional ownership filings, Gompers and Metrick (2001) document a significant positive relation between quarterly institutional ownership and future stock returns, but attribute this relation to temporal demand shocks rather than superior investment skill. Using the same dataset, Cai and Zheng (2004) actually find that changes in institutional holdings are *negatively* related to next quarter's returns and attribute this to the price impact of institutional trades. Perhaps the strongest evidence in favor of superior institutional investor skill comes from Chen, Jegadeesh, and Wermers (2000), who use quarterly stockholdings data to examine the performance of stocks held and traded by mutual funds. They find that although stocks held by mutual funds do not outperform other stocks, stocks that mutual funds purchase offer significantly higher subsequent returns than the stocks they sell. However, Chen, Jegadeesh, and Wermers (2000) find almost no evidence that this superior trading skill is persistent.

There are at least two problems with the use of quarterly holdings or changes in quarterly holdings to measure portfolio manager trading skill. First, changes in quarterly holdings data do not reflect intra-quarter transactions where managers purchase and sell or sell and re-purchase the same stock (hereafter referred to as round-trip trades). These intra-quarter round-trip trades represent a significant fraction of institutions' total trading volume. In our sample, we find that

[3] Passive decisions to hold stocks already in the portfolio may occur to minimize benchmark tracking errors or for tax reasons (Jin (2006)).

[4] Publicly available data are limited to institutional holdings contained in quarterly 13F filings or mutual fund holdings reports, both of which provide a snapshot of institutional portfolios at quarterly intervals. The Securities Act Amendment of 1975 requires that institutional investors managing more than $100 million report their portfolio holdings to the Securities and Exchange Commission (SEC) on a quarterly basis (13F filings). Section 30 of the Investment Company Act of 1940 required mutual funds to report portfolio holdings at the end of each fiscal quarter. Beginning 1985, the SEC required that mutual funds report their holdings semiannually.

round-trip transactions account for 22.89% of the average portfolio manager's trades.[5] Second, quarterly holdings data are not able to accurately identify the timing of trades. Studies using quarterly data commonly assume that all trades occur at the end of the quarter, but in fact they could occur at anytime within the quarter. Imprecision in the estimated timing of trades may limit researchers' ability to identify superior trading skills if institutional trades are motivated by short-lived private information where profitable trading opportunities dissipate quickly. In addition, stock price variation within the quarter is quite large. Using all U.S. common stocks for the period 1981-2005, we find that, on average, the intra-quarter high price is approximately 36% higher than the intra-quarterly low price.[6] Therefore, identifying round-trip trades and precisely identifying the timing of trades are critical for accurately evaluating the stock trading skills of institutional portfolio managers.

The purpose of this paper is to provide a first study of the intra-quarter trading skill of institutional investors. We overcome the shortcomings of quarterly institutional holdings data by using a proprietary database of institutional trades. The Abel Noser database contains trades from 840 institutions (3,816 different portfolio managers), who are responsible for approximately 8% of total CRSP trading volume during the 1999 to 2005 sample period. The Abel Noser database contains all intra-quarter trades for portfolio managers in our sample, including round-trip trades. Moreover, this database identifies the exact timing of each trade and the price at which each trade is executed. Using this database, we document robust evidence that some institutional portfolio managers possess superior and persistent interim trading skills.

[5] Our findings is consistent with Elton, Gruber, Kransny and Ozelge (2006) who estimate that that use of quarterly data misses approximately 20% of a mutual fund managers trades.

[6] The percentage difference between intra-quarter high and low prices is even higher at 41.42% for our sample period 1999-2005. See Table 2 for more details.

We begin our investigation by examining the performance of intra-quarter round-trip trades. We calculate the holding period return for each round-trip trade and adjust the raw return using DGTW benchmark portfolio returns (Daniel, Grinblatt, Titman, and Wermers (1997)). For the average portfolio manager in our sample, the abnormal return for round-trip trades executed within a quarter is 1.68% (*t*-statistic=25.19). This result suggests that, on average, portfolio managers have superior round-trip trading ability. To investigate the persistence of this trading skill, each quarter we sort portfolio managers into quintiles based on the abnormal performance of their round-trip trades. Subsequent quarter abnormal round-trip trading performance is 4.73% for high skill (quintile 5) portfolio managers and -1.31% for low skill (quintile 1) managers, and the difference between these extreme quintiles (6.04%) is both economically and statistically significant. Overall, our results suggest that institutional managers possess significant and persistent skills in their round-trip trades.

To the extent that portfolio managers are subject to the disposition effect documented by Odean (1998): selling winners too quickly and holding losers too long, our analysis of round-trip trading performance may not accurately reflect the performance of all of a portfolio manager's trades. To address this issue, we present a second series of tests to capture the intra-quarter performance for all trades. For each portfolio manager, we track the equal- (principal-) weighted DGTW abnormal performance of stocks the manager buys and stocks that she sells from the execution date (and execution price) until the end of the quarter by marking trading positions to market at the end of the quarter. If portfolio managers have stock-picking skills, stocks that portfolio managers buy should outperform the stocks they sell. For the average portfolio manager in our sample, stocks that the portfolio manager buys outperform the stocks she sells by an average of 0.91% (0.67%) using equal- (principal-) weighted averages (hereafter referred to

as abnormal trading performance). This result is consistent with Chen, Jegadeesh, and Wermers (2000) and suggests that, on average, portfolio managers have superior ability in timing their trades within the quarter.

Similar to our analysis of round-trip trades, each quarter we sort portfolio managers into quintiles based on the magnitude of their abnormal trading performance. High skill (quintile 5) portfolio managers have positive abnormal trading performance of 1.82% in the quarter following portfolio formation, compared to abnormal trading performance of -0.19% for low skill (quintile 1) managers. The difference in subsequent quarter abnormal trading performance is significant between these extreme quintiles, and continues to be significantly different for four quarters following the portfolio formation period. More importantly, we find that the persistence in abnormal trading performance is almost entirely driven by high-skill managers. Our results contrast with much of the recent mutual fund performance persistence literature (e.g., Carhart (1997)), which finds that persistence, when it exists, is driven by past underperforming funds that charge high fees.

We perform a series of tests to evaluate the robustness of our results. First we investigate whether abnormal trading performance and persistence results differ between money managers and pension plan managers. We posit that money managers are more likely than pension plan managers to experience unexpected inflows/outflows of capital (Dasgupta, Prat, and Varanado (2007)). If unexpected fund flows result in uninformed trading activity, then the abnormal interim trading performance should be more positive and more persistent for pension fund managers than for money managers. Our results are consistent with these priors. We also investigate whether the demonstrated persistence of portfolio manager abnormal trading performance hold at the institution level. It is possible that private information used to generate

abnormal trading performance is shared among all portfolio managers within an institution, or that some institutions may systematically receive better execution quality than others. We repeat our persistence analysis at the institution level and find that the abnormal trading performance of quintile 5 institutions exceeds that of quintile 1 institutions by 1.24% in the quarter following portfolio formation. Our results suggest that a significant fraction of the documented persistence may be attributed to institution-level factors. Finally, we investigate portfolio manager abnormal trading performance in large versus small stocks. The equal- (principal-) weighted abnormal trading performance in small stocks is 0.95% (0.71%) versus 0.89% (0.70%) for large stocks. All abnormal trading performance results are statistically significant, and suggest that our results are not driven by trading in the smallest stocks.

Overall, we find strong evidence that institutional portfolio managers possess superior interim trading skill. More importantly, we find evidence of persistence in interim trading skill and this persistence is driven by high-skill managers. These results leave little doubt that the documented abnormal trading performance is a reflection of managerial skill as opposed to luck. Our results complement the findings of Chen, Jegadeesh, and Wermers (2000) and suggest that prior studies using quarterly data have likely understated the investment skill of institutional portfolio managers.

Our finding that portfolio managers possess significant interim trading skill is consistent with several recent studies on short-term mutual fund performance and short-term institutional investors. Bollen and Busse (2001, 2004) find stronger evidence of market timing skills and performance persistence using daily fund returns when compared to using monthly fund returns. Ke and Ramalingegowda (2005) find that transient institutional investors exploit the post-earnings announcement drift while dedicated institutional investors do not. Finally, Yan and

Zhang (2008) find that short-term institutional investors are better informed than long-term institutional investors.[7]

Our paper is closely related to Kacperczyk, Sialm, and Zheng (2007), who investigate the difference between mutual fund managers' reported fund returns and the performance of a static portfolio made of the manager's previously disclosed quarterly holdings. They suggest that these deviations ('return gap') can be interpreted as a way to quantify the unobserved actions of portfolio managers. They show that the unobserved actions of some funds persistently create value, and that return gap predicts future fund performance. In this paper, we use portfolio managers' actual trades to examine the most important type of unobserved actions - interim trading. Our results are consistent with Kacperczyk, Sialm, and Zheng (2007) and suggest that interim trading skill is an important reason why return gap is persistent and predicts future performance.

The remainder of the paper proceeds as follows. The next section discusses our data and methods. Section III presents the results of our tests, and Section IV concludes.

II. Data and Methods

A. Data, Sample, and Summary Statistics

We obtain data on institutional trades for the period from January 1, 1999 to December 31, 2005 from the Abel Noser Corporation. Abel Noser is a widely recognized consulting firm that works with institutional investors to monitor their equity trading costs. Abel Noser clients

[7] Our paper also provides an institutional analog to several concurrent working papers investigating individual investors' trading skill. These papers use proprietary databases containing trade level data for a subsample of individual traders to investigate trading persistence. Coval, Hirshliefer, and Shumway (2007) find that the top decile of individual traders (ranked on past performance of trades) earn abnormal returns of 12 to 15 basis points per day in the following week, while the bottom decile loses up to 12 basis points per day during the same week. Barber, Lee, Liu, and Odean (2004) find strong evidence of persistent ability for a small group of individual day traders on the Taiwan exchange, in that traders with strong past performance continue to earn high returns (even after accounting for transaction costs).

include pension plan sponsors such as CALPERS, the Commonwealth of Virginia, and the YMCA retirement fund, as well as money managers such as Fidelity, MFS (Massachusetts Financial Services), Putman Investments, and Lazard Asset Management. Private conversations with Abel Noser indicate that the database does not suffer from a survivorship bias. Previous academic studies that have used Abel Noser data include Goldstein, Irvine, Kandel and Wiener (2008), Chemmanur and Hu (2007), and Lipson and Puckett (2007). We obtain stock returns, share price, and shares outstanding from CRSP, and include only common stocks (i.e. securities with a CRSP sharecode of 10 or 11) in our sample. We obtain book value of equity from Compustat.

Summary statistics for Abel Noser trade data are presented in Table 1. The Abel Noser trading database contains a total of 840 different institutions (3,816 different portfolio managers) responsible for approximately 87 million trades (reported executions) over our sample period.[8] For each execution Abel Noser provide 107 different variables. Our study uses seven of these variables including the institution identity code, the identity code of the portfolio manager within each institution, date of execution, stock traded, number of shares executed, execution price, and whether the execution is a buy or sell.[9] The identities of the institution and portfolio manager are not provided to us to protect the privacy of Abel Noser clients; however, the unique identity codes allow us to distinguish between different portfolio manager's trades both in the cross-section and through time.[10] The total number of different stocks traded by institutions varies

[8] The Abel Noser data contain trades for two institutions classified as "brokers". These institutions are excluded from our analysis since we are unable to discern whether these trades represent market-making activities by the brokerage firm, or trades for the brokerage firm's own account.

[9] Identifying variables also include summary execution costs for ticket orders which often include multiple executions. These variables include the share-weighted execution costs and total number of shares executed in the ticket.

[10] Abel Noser provides two separate reference files 'clientTypeXref' and 'managerXref' that we merge with the original trade data. The first allows us to identify the type of institution trading and the second allows us to track specific portfolio managers through time.

from 4,692 in 2002 to 6,150 in 1999, while the average number of shares per trade varies from 6,669 in 2005 to 11,159 in 2001. Over the entire sample period, Abel Noser institutional clients traded more than 755 billion shares, representing more than $22.9 trillion worth of stock trades. The institutions in our sample, on average, are responsible for approximately 8% of total CRSP daily dollar volume during the 1999 to 2005 sample period.[11] Thus, while our data represents the activities of a subset of pension funds and money managers, it represents a significant fraction of total institutional trading volume.

Quarterly institutional holdings data do not capture intra-quarter round-trip trades and cannot identify the exact timing of each trade. The Abel Noser database overcomes these two limitations of the quarterly holdings data. Conversations with Abel Noser confirm that our database captures all trades for portfolio managers in our sample, and therefore allows us to identify intra-quarter round-trip trades.[12] Moreover, the Abel Noser database identifies the exact timing of each trade and the execution price, which enables us to more accurately examine whether portfolio managers have superior trading skill.

Prior studies using changes in quarterly holdings to infer trading activity typically assume that all trades occur on the last day of the quarter (Chen, Jegadeesh, and Wermers (2000)). If price variation within the quarter is sufficiently large, then imprecision in the estimated timing of trades is problematic. We investigate the potential magnitude of this problem in Table 2. Our findings indicate that for the average stock during the 1999 to 2005 sample period, the percentage difference between the highest price and lowest price within the quarter is 41.42%.

[11] We calculate the ratio of Abel Noser trading volume to CRSP trading volume during each day of the sample period. We include only stocks with sharecode equal to 10 or 11 in our calculation. In addition, we divide all Abel Noser trading volume by two, since each individual Abel Noser client constitutes only one side of a trade. We believe this estimate represents an approximate lower bound for the size of the Abel Noser database.

[12] Abel Noser receives trading data directly from the Order Delivery System (ODS) of all money manger clients, and therefore includes all trades executed by managers. The method of data delivery for pension plan sponsors is more heterogeneous, but similar to money managers, include all executed trades.

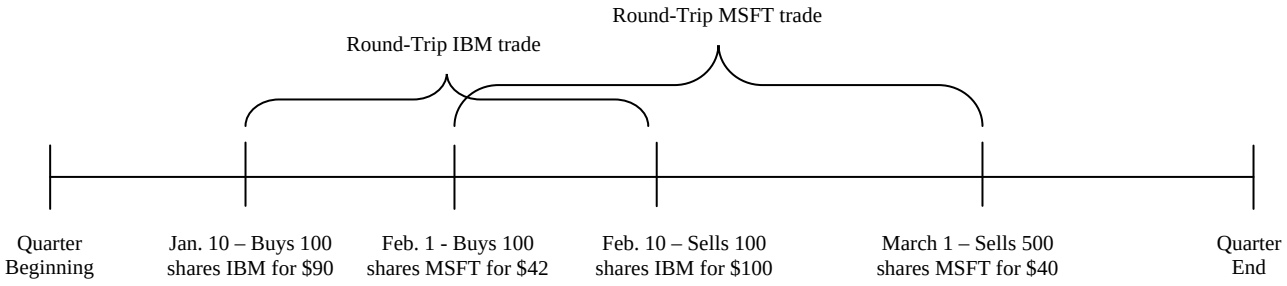
The difference is 21.27% when we compare the highest price within the quarter to the quarter-end price, and -20.15% when comparing the lowest price within the quarter to the quarter-end price. Since our data contain actual execution prices, the trading skill measures we employ are not subject to measurement error.

B. Measures of Interim Trading Skill

B.1. Round-Trip Trades

Our first interim trading skill measure focuses on intra-quarter round-trip trades. We proceed as follows: For each portfolio manager, we select all trades within a quarter where the manager both buys and sells a particular stock. We use execution prices to determine the holding period return for each round-trip trade (raw return), and subtract the DGTW benchmark portfolio return over the same holding period to calculate abnormal returns. We then compute the average principal-weighted raw and abnormal return of all round-trip trades for each portfolio manager during each quarter. The method used for calculating round-trip trading performance is illustrated below:

Trading for Portfolio Manager A



In the above illustration, portfolio manager A executes two round-trip trades within the quarter. We calculate the raw holding-period return for both trades: for IBM the holding period return is 11.11% (=($100-$90)/$90)) and for MSFT the return is -4.76% (=($40-$42)/$42)). To

compute abnormal returns we subtract the DGTW benchmark return over the identical holding period for each round-trip trade: for IBM the holding period DGTW benchmark return is calculated from January 10 to February 10. Finally, we calculate the raw (and abnormal) trading performance for portfolio manager A by taking the principal-weighted average of all round-trip trades within each quarter. The principal-weighted raw round-trip trading performance for portfolio manager A is 6.06%, where the weight for the IBM trade is 0.6818 (=$9,000/$13,200) and 0.3182 (=$4,200/$13,200) for the MSFT trade. For expositional convenience, we assume that portfolio manager A made only two intra-quarter round-trip trades in this illustration. In our empirical analysis, we exclude those manager-quarter observations where the portfolio manager made fewer than five round-trip trades.

DGTW benchmark portfolios are constructed as follows: in June of each year stocks are ranked based on market capitalization and assigned to size quintiles based on NYSE size-quintile breakpoints. Within each size quintile, stocks are sorted into quintiles based on market-to-book ratios (resulting in 25 size- and book-to-market fractiles). In each of these 25 fractiles, stocks are again sorted into quintiles based on prior 12-month returns. This process results in 125 fractiles, and the benchmark return for each fractile is the value-weighted holding period return (Daniel Grinblatt, Titman, and Wermers (1997)). We refer the reader to Daniel et al (1997) for further details.

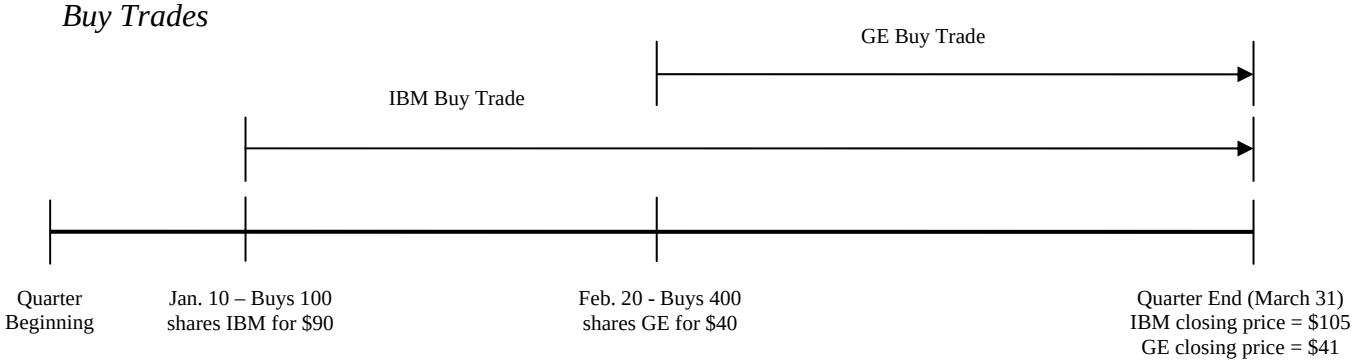
B.2. All Trades

Our second interim trading skill measure applies to all intra-quarter trades. We proceed as follows: for each portfolio manager, we separate all trades within the quarter into buys and sells. We calculate the raw holding period return for each trade using the execution price and the CRSP reported closing price on the last day of the quarter. Our return calculations account for

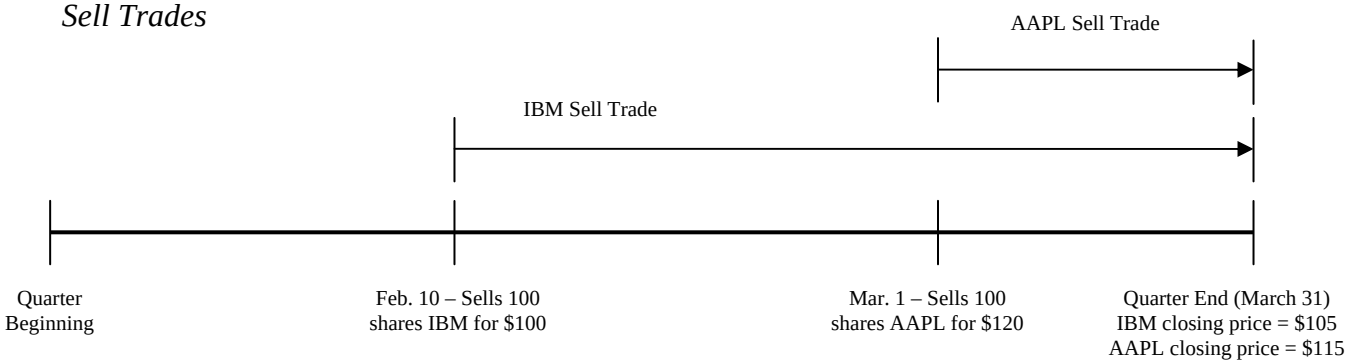
both stock splits and dividend distributions. We subtract the DGTW benchmark portfolio return from each trading position raw return over the same holding period to compute abnormal returns. For each portfolio manager we then compute the equal- and principal-weighted average abnormal returns for buys and sells separately. Finally, we calculate the difference between DGTW adjusted returns for buys and sells. Our measure is consistent with Chen, Jegadeesh, and Wermers (2000). We again use an illustration to clarify our methodology:

Trading for Portfolio Manager B

Buy Trades



Sell Trades



In the above illustration, portfolio manager B executes two buy trades and two sell trades within the quarter. For buy trades: the raw return corresponding to the IBM trade is 16.67% (=($105-$90)/$90) and for GE the return is 2.5% (=($41-$40)/$40). For sell trades: the raw return corresponding to the IBM trade is 5.0% (=($105-$100)/$100) and for AAPL the return is -

4.17% (=($115-$120)/$120). To compute abnormal returns we subtract the DGTW benchmark return over the identical holding period (e.g. for GE the holding period DGTW benchmark return is calculated from February 20 to March 31). For simplicity we assume all DGTW benchmark returns are 0% in this illustration. The equal- (principal-) weighted average return for buy trades is 9.59% (7.60%), and for sell trades the return average is 0.42% (-0.04%).[13] Finally, we compute the difference in buy and sell average returns (this difference is hereafter referred to as abnormal trading performance). The difference in equal-weighted averages is 9.17% (=9.59%-0.42%) and for principal-weighted averages the difference is 7.64% (=7.60%+0.04%). In our empirical analysis, we exclude those manager-quarter observations where the portfolio manager made fewer than 20 buys or 20 sells.

III. Empirical Results

A. Round-Trip Trades

We begin our study by investigating the performance of intra-quarterly round-trip trades. If institutional trades are motivated by value-relevant private information and profitable trading opportunities dissipate quickly, we may expect rational managers to reverse their trading in order to lock in gains and reduce the idiosyncratic risk that their positions may engender. This type of trading behavior is consistent with Hirshleifer, Subramanyam and Titman (1994), who model the trading behavior of investors who receive private information. In the period before information is publicly revealed, informed investors will trade in order to exploit their information advantage. When information is publicly revealed, early informed investors will partially reverse their

[13] The weights used in calculating the principal-weighted averages are as follows: for the buy trade portfolio, the IBM trade weight is 0.36 (=$9,000/$25,000) and the GE trade weight is 0.64 (=$16,000/$25,000). For the sell trade portfolio the IBM trade weight is 0.45 (=$10,000/$22,000) and the AAPL trade weight is 0.55 (=$12,000/$22,000).

trading in order to lock in gains. Therefore, we hypothesize that if portfolio managers possess trading skill, their abnormal round-trip trading performance will be positive.

We present raw and abnormal holding period returns for intra-quarter round-trip trades across all portfolio managers in Panel A of Table 3. Consistent with estimates by Elton, Gruber, Kransny and Ozelge (2006), we find that 22.89% of all trades in our sample are intra-quarter round-trip trades. Our results show that average raw and abnormal returns for round-trip trading activity are significantly positive for our sample of portfolio managers. For the average portfolio manager in our sample, raw returns from round-trip trades are 2.45%, and DGTW abnormal returns are 1.68% (both are significant at the 1% level). We find abnormal returns from round-trip trading activity are larger for pension fund managers (1.72%) than for money managers (1.28%). To estimate the contribution of these round-trip trades to the overall portfolio performance, we assume that portfolio managers turn their portfolios over once a year (i.e., 100% turnover rate). Given that 22.89% of all trades are intra-quarter round-trip trades, our back of the envelope calculation indicates that these trades contribute approximately 0.38% abnormal returns per year to the overall portfolio.

In untabulated results, we find that these round-trip trades are profitable even after accounting for trading costs. First, we note that since we use actual execution prices to compute holding period returns, our measure of performance fully accounts for implicit trading costs (e.g. price impact). Second, the Abel Noser database also reports the commission amount paid for each trade. Using this information, we find that commissions are approximately 15 basis points for the average-size trade; and the average raw return for round-trip trades still exceeds 2% after accounting for implicit and explicit trading costs.

We investigate the time series variation in round-trip trading performance and present results in Panel B of Table 3. Our findings indicate that for the average portfolio manager, raw and abnormal round-trip trading returns are significantly positive in all sample years. Raw returns vary from 4.17% in 1999 to 0.53% in 2002, while abnormal returns range from 3.36% in 1999 to 0.46% in 2002. Our results support the hypothesis that, on average, portfolio managers possess significant trading skill.

Although portfolio mangers' round-trip trading activity, on average, exhibits positive abnormal performance, a more demanding (and necessary) test of manager skill is whether certain managers persistently outperform. We sort portfolio managers into quintiles based on the abnormal performance of their round-trip trading activity during each of the twenty four quarters from 1999 to 2004.[14] Managers with the lowest abnormal round-trip trading performance are assigned to quintile 1, while those with the highest abnormal round-trip trading performance are assigned to quintile 5. We then track the abnormal round-trip trading performance for each manager quintile during the subsequent four quarters. We note that, by definition, abnormal round-trip trading performance in a particular quarter depends only on round-trip trades executed within that quarter. Therefore, the momentum of prior holdings is not a concern in our sample (Carhart, 1997). Consistent with Carhart (1997), managers that drop out of the data set during the evaluation period are included in the quintile portfolio until they disappear, after which portfolio weights are re-adjusted.

Our round-trip trading persistence results are presented in Table 4. We document strong evidence that past round-trip abnormal trading performance is related to future performance. Portfolio managers with the worst round-trip trading performance during the quarter of portfolio

[14] Our portfolio formation period excludes the 2005 sample year, since we evaluate performance persistence for the subsequent four quarters.

formation (i.e. quintile 1 managers) continue to do poorly in the subsequent quarters. Specifically, the abnormal performance of their round-trip trades are -1.31%, -1.16%, -0.98%, and -1.10% during the subsequent four quarters. Similarly, those managers with the best trading performance during the portfolio formation quarter (i.e. quintile 5 mangers) continue to have positive abnormal performance of 4.73%, 4.40%, 4.00%, and 3.74% during the next four quarters. The magnitude of abnormal round-trip trading performance increases monotonically from quintile 1 to quintile 5 managers in all four subsequent quarters. In addition, the difference in abnormal round-trip trading performance between quintile 1 and quintile 5 managers is statistically significant at the 1% level and ranges from 6.04% in the first quarter following portfolio formation to 4.84% in the fourth quarter following portfolio formation.

Our analysis of the abnormal performance (and persistence) of round-trip trading activity is an important component in our understanding of whether institutional portfolio managers possess trading skill, however, it is also subject to potential limitations. By construction, our analysis only captures the short-term realized gains or losses that managers experience within a quarter and does not capture the unrealized gains or losses. More importantly, if managers are subject to the same disposition effect that Odean (1998) documents for individual investors: selling winners too quickly and holding on to losers too long, then such tests may not accurately reflect the performance of all of a manager's trades.[15] In order to fully capture the trading skill of portfolio managers, we must analyze all portfolio manager trades.

B. All Trades

A more comprehensive test of manager trading skill includes analyzing the performance of all trades executed within each quarter. Similar to our previous discussion, we hypothesize

[15] Even if the portfolio managers are subject to the disposition effect, our finding that managers earn significant positive abnormal returns on their intra-quarter round-trip trades still suggests that previous studies that ignore round-trip trades (due to data constraints) have understated the trading performance of institutional investors.

that if portfolio managers possess trading skill then the stocks that a portfolio manager buys will significantly outperform the stocks she sells. We note that it is likely that some trades by portfolio managers are exogenously determined by inflows and/or redemptions. As such, these trades will likely contain little information, and should bias our study against finding evidence of portfolio manager trading skill (Berk and Green, 2004).

We present abnormal trading performance averages for all portfolio managers in Panel A of Table 5. Using equal-weighted averages, we find that the stocks portfolio managers buy significantly outperform DGTW benchmarks by 0.70%, while the stocks managers sell significantly underperform the benchmarks by 0.22%. Furthermore, the stocks managers buy significantly outperform the stocks managers sell by 0.91%. Principal-weighted averages produce qualitatively similar results, where the abnormal return of stocks that managers buy (sell) is 0.54% (-0.13%). All of these results are statistically significant at the 1 percent level.

Panel A of Table 5 also presents the results separately for money managers and pension plan managers. For both categories, we find that their buys outperform DGTW benchmarks while their sells underperform the benchmarks. Our results hold for both equal-weighted and principal-weighted averages. Focusing on the performance difference between buys and sells, we find that equal-weighted (principal-weighted) abnormal trading performance is 0.94% (0.67%) for pension fund managers and 0.55% (0.63%) for money managers. Again, our results suggest that, on average, portfolio managers have superior skills in timing their intra-quarterly trades.

Consistent with our analysis for round-trip trades, we investigate the time series variation in abnormal trading performance and present results in Panel B of Table 5. For expositional convenience we focus on the performance difference between buys and sells, which we call

abnormal trading performance. Abnormal trading performance is significantly positive across all sample years. Equal-weighted abnormal trading performance ranges from 1.24% in 2000 to 0.60% in 2005, and principal-weighted abnormal trading performance varies from 0.89% in 2002 to 0.43% in 2005.

To test for the persistence of abnormal trading performance, we sort portfolio managers into quintiles based on the principal-weighted abnormal performance of their trades during each of the twenty four quarters in the 1999 to 2004 sample period. Portfolio managers with the lowest abnormal performance are assigned to quintile 1, while those with the highest abnormal performance are assigned to quintile 5. We then track the principal-weighted abnormal trading performance for managers in each quintile over the subsequent four quarters. By construction trade executions are not overlapped across the time-series of quarterly observations, therefore, the momentum of prior holdings is not a concern in our sample (Carhart, 1997).

We find strong evidence that past trading performance is related to future trading performance, and we present all results in Table 6. Quintile 1 managers have the worst abnormal trading performance in the quarter of portfolio formation, and continue to exhibit negative abnormal trading performance of -0.19%, -0.16%, -0.21%, and -0.26% during the subsequent four quarters. Quintile 5 managers have the best abnormal trading performance during the portfolio formation quarter, and continue to display positive abnormal trading performance of 1.82%, 1.67%, 2.02%, and 1.91% during the following four quarters. The magnitude of abnormal trading performance is monotonically increasing from quintile 1 to quintile 5 in all four subsequent quarters. The table also presents differences between extreme quintiles, which is statistically significant in all four subsequent trading quarters and ranges from 1.83% in quarter two to 2.23% in quarter four. Overall, we find strong evidence of persistence in managers'

interim trading skills. More importantly, we show that this persistence is primarily driven by skilled managers. Our results are in contrast to Carhart (1997), who shows that performance persistence is driven by past underperforming funds which tend to charge higher fees.

C. Robustness Tests

C.1. Portfolio Manager Type

We evaluate the robustness of trading persistence results by investigating pension fund managers and money managers separately. Abel Noser identifies each institution (and portfolio manager) in our sample as either a pension plan sponsor or money manager. There are 636 pension plan sponsors (out of 840 institutions) in our sample who are responsible for approximately 24 million executions. Although money managers represent only 204 of the 840 total institutions in the sample, they account for the majority of executions (approximately 63 million). If money managers are more likely than pension plan managers to be subject to unexpected inflows and outflows of capital, as suggested by Dasgupta, Prat, and Varanado (2007), then we may expect differences in the persistence of abnormal trading performance across the two manager types. Specifically, if unexpected inflows and redemptions result in uninformed trading activity, then manager ability should be more apparent in the pension fund manager sample. We present results for each type of manager separately in Table 7. For both pension fund managers and money managers, we confirm that the abnormal performance of past trades is significantly related to future abnormal trading performance. Panel A of Table 7 reports that quintile 5 pension fund managers significantly outperform quintile 1 managers during each of the subsequent four quarters. The performance difference is 2.06% in the first quarter following portfolio formation and 2.27% in quarter four. Consistent with our priors, Panel B of Table 7 reports that this performance difference is attenuated for money managers, although it is

still statistically significant in each of the four quarters that we analyze. Quintile 5 money managers outperform quintile 1 managers by 1.35% during the first quarter following portfolio formation and by 0.73% in quarter four.

C.2. Institution Level Analysis

It is possible that private information used to generate abnormal trading performance is common to all mangers within a particular institution. Chen, Hong, Huang and Kubik (2004) find evidence consistent with this proposition in that abnormal returns are lower for larger funds, but higher for larger fund families. To investigate whether persistence in abnormal trading performance is driven by institution-level factors, we repeat our analysis of persistence at the institution level. Similar to previous tests, each quarter we sort all institutions into quintiles based on principal-weighted abnormal trading performance. We then track the principal-weighted abnormal trading performance for institutions in each quintile over the subsequent four quarters.

Results presented in Table 8 are similar to earlier results on individual manager persistence in terms of statistical significance, but are lower in overall magnitude. We find no persistence for the quintile 1 (low trading performance) institutions, since abnormal returns during the subsequent four quarters are now slightly positive (between 2 and 18 basis points) but not statistically significant. Quintile 5 (high trading performance) institutions have positive abnormal trading performance of 1.26% in the first quarter following portfolio formation and 1.21% in quarter four. More importantly, the difference between extreme quintiles remains positive and significant for all four quarters following portfolio formation. Abnormal trading performance of quintile 5 institutions exceeds that of quintile 1 institutions by 1.24% in the quarter following portfolio formation, and by 1.03% in quarter four.

The above results indicate that a significant fraction of portfolio manager persistence in trading skill can be attributed to institution-level factors. However, due to self-selection concerns, we remain cautious in our interpretation of these results. One possible explanation for our results is that some institutions gather and possess disproportionate amounts of value-relevant private information which they share with portfolio managers in their organization. An alternate, and equally plausible, theory is that the most skilled portfolio managers select (or are selected by) certain institutions.

C.3. Firm Size

We now investigate whether our abnormal trading performance results are driven by managers who choose to trade in small stocks. We may expect more informed portfolio manager trading in smaller stocks where the publically available information environment is more limited. In this case we should find higher abnormal trading performance in small stocks when compared to large stocks. Alternatively, since smaller stocks are less liquid than large stocks and the price impact of institutional trades is likely to be greater in smaller stocks, it is also more costly to trade smaller stocks. Given these competing factors, we do not have strong priors regarding portfolio managers' abnormal trading performance in small versus large firms.

We structure our tests as follows: for each portfolio manager we divide stock trades in each quarter by the median NYSE breakpoint value. We then compute the equal- and principal-weighted DGTW abnormal trading performance for large and small stock sub-samples using the same methodology presented in Table 5. We present abnormal trading performance averages for large stocks in Panel A of Table 9, and for small stocks in Panel B of Table 9. For the average portfolio manager in our sample, the equal- (principal-) weighted abnormal trading performance in small stocks is 0.95% (0.71%) versus 0.89% (0.70%) for large stocks. All abnormal

performance results for both large and small stock portfolios are statistically significant at the 1% level. Our results suggest that portfolio managers trades are slightly more profitable in small stocks, however, the economic difference between trading performance measures is extremely small (between 1 and 6 basis points per quarter).

For completeness, we also examine the persistence of abnormal trading performance for large and small stocks using an identical methodology to that presented in Table 6. Persistence results for large stock trades are presented in Panel C of Table 9, and persistence results for small stock trades are presented in Panel D of Table 9. For both large and small stocks, quintile 5 (high performance) portfolio managers significantly outperform quintile 1 portfolio managers in all four subsequent quarters. Specifically, we find that the difference between extreme quintiles is 1.79% (2.56%) for large (small) stock trades in the fourth quarter following portfolio formation.

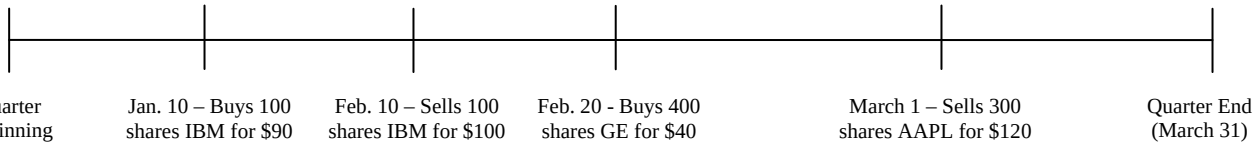
C.4. Reconcile with studies using changes in quarterly holdings

Our final analysis attempts to reconcile our sample and results with prior studies that use changes in quarterly holdings data to investigate the performance of institutional portfolio manager trades. The purpose of this exercise is to highlight the importance of identifying both round-trip trades and the precise timing of trades in studies investigating portfolio manager trading skill.

For each portfolio manager we track all trades within a quarter and calculate the net trading position for each stock as of the quarter end. These net trading positions represent net changes in holdings from the previous quarter and ignore round-trip transactions (similar to Chen, Jegadeesh, and Wermers (2000)). We then calculate the DGTW equal- and principal-weighted abnormal return performance for buys (positive net trading positions) and sells (negative net trading positions) separately over the subsequent quarter, and compute the

difference between DGTW adjusted returns for buys and sells. We hereafter refer to this difference as implied *quarterly* trading performance (to differentiate from our previous *interim* trading performance measures). Our methodology is consistent with Chen, Jegadeesh, and Wermers (2000) and implicitly assumes that all trades occur at the closing price on the last day of the quarter. We again use an illustration to clarify our methodology:

Trading for Portfolio Manager C



In the above illustration, portfolio manager C executes four trades within the quarter. The net trading positions as of March 31(quarter end) are as follows: 0 shares of IBM (100 shares bought – 100 shares sold), 400 shares of GE purchased, and 300 shares of AAPL sold. We then track the equal- and principal-weighted DGTW abnormal returns for net buy positions (400 shares of GE) and net sell positions (300 shares of AAPL) over the subsequent quarter (April 1 through June 30). Finally, we compute the difference between buy and sell portfolios for the manager.

We present abnormal return averages for implied quarterly trading performance in Table 10. Panel A shows that the average equal- (principal-) weighted implied quarterly trading performance is -0.31% (-0.33%) and both are statistically significant at the 1% level. These results suggest that the stocks portfolio managers buy *underperform* the stocks portfolio managers sell during the *subsequent* quarter, which is opposite to our finding of positive abnormal trading performance within the *current* quarter.

Our findings appear to be inconsistent with Chen, Jegadeesh and Wermers (2000) who find that stocks mutual fund managers buy outperform stocks they sell. However, upon closer investigation we find some similarities between our results and theirs. First, our sample contains both pension plan sponsors and money managers. Our results (presented in Panel A of Table 10) show that underperformance of pension plan sponsors is driving the aggregate results. The implied quarterly trading performance for money managers is insignificantly different from zero (-0.08%), and this subsample is more similar (than pension fund managers) to the mutual fund managers sample analyzed by Chen, Jegadeesh and Wermers (2000). Second, we find some evidence of positive implied quarterly trading performance when separating the sample by year. Panel B of Table 10 reports that the implied quarterly trading performance is significantly positive at 0.56% in 1999, but is negative in all subsequent sample years. We note that Chen, Jegadeesh, and Wermers (2000) analyze the sample period from 1975 to 1995 in their study. Further, the finding of negative performance in the subsequent quarter is consistent with several studies that focus on the recent sample periods. Specifically, Sharma, Easterwood, and Kumar (2006), Brown, Wei, and Wermers (2007), and Dasgupta, Prat, and Verardo (2007) document evidence of return reversals following institutional trading or herding for the recent sample periods.

To investigate the persistence of implied quarterly trading performance, we proceed in a manner similar to previous tests. We sort portfolio managers into quintiles based on their principal-weighted abnormal implied quarterly trading performance and track the implied trading performance of each manager quintile over the subsequent four quarters. Consistent with prior tests, managers with the lowest implied quarterly trading performance are assigned to quintile 1, while those with the highest are assigned to quintile 5.

We present our results in Table 11. We find only weak evidence of persistence among fund managers, and perhaps more importantly, this persistence is only evident for quintile 1 (poor performing) fund managers. Quintile 1 managers continue to exhibit negative implied trading performance of -0.35%, -0.51%, -0.40% and -0.62% in the subsequent four quarters. Alternatively, quintile 5 managers have an implied quarterly trading performance that is insignificantly different from zero in three of the four subsequent quarters. The difference between quintile 5 and quintile 1 is marginally significant for the second and fourth quarter, and is insignificant for the other two quarters. The weak evidence of implied quarterly trading performance persistence is consistent with Chen, Jegadeesh and Wermers (2000).

In summary, when we use the methodology of prior studies (i.e., ignore round-trip trades and the timing of intra-quarter trades); we find no evidence of significant trading skills for the average portfolio manager in our sample. Further, we find little evidence of trading skill persistence. These results are in stark contrast to our earlier findings that portfolio managers possess significant and persistent intra-quarter trading skills. Our results underscore the importance of identifying intra-quarter trades.

IV. Conclusion

The question of whether institutional investors have stock-picking skills is an important test of the efficient market hypothesis. Prior empirical studies using quarterly holdings data find mixed evidence regarding the stock-picking skills of institutional investors; however, there are two distinct limitations of quarterly institutional holdings data. First, the data does not capture intra-quarter round-trip trades; and second, it cannot identify the exact timing of trades. Our paper is the first to study the intra-quarter trading skills of institutional investors. We use a

proprietary database of institutional trading data provided by the Abel Noser Corporation to overcome the limitations of quarterly institutional holdings data.

We first examine the performance of intra-quarter round-trip trades, and find that portfolio managers in our sample, on average, earn abnormal returns of 1.68%. We then sort portfolio managers into quintiles based on the abnormal performance of their round-trip trades and find that subsequent quarter abnormal round-trip trading performance is persistent for both high-skill and low-skill managers.

We present a second series of tests to capture intra-quarter trading skill across all trades. If portfolio managers have stock-picking skills, stocks that portfolio managers buy should outperform the stocks they sell. For the average portfolio manager in our sample, stocks that portfolio managers buy outperform the stocks they sell by 0.91% (0.67%) using equal- (principal-) weighted averages. Again, we sort portfolio managers into quintiles based on their abnormal trading performance and find significant persistence for high skill managers. Specifically, we find that the abnormal trading performance in the first quarter following portfolio formation is 1.82% for high-skill portfolio managers and -0.19% for low-skill portfolio managers. Overall, our results suggest that institutional portfolio managers possess significant and persistent interim trading skills.

We perform a series of tests to evaluate the robustness of our results. Our findings indicate that trading skill results are present for both pension fund managers and money managers, as well as for managers trading in both large and small stocks. In addition, we find that a significant fraction of the persistence we document may be attributed to institution-level factors.

Our final test attempts to reconcile our sample with prior studies that use changes in quarterly holdings to evaluate the trading skill of portfolio managers. For each portfolio manager we track all trades within a quarter and calculate the net trading position for each stock at quarter-end. We then track the performance of these "implied" trades over the following quarter. Similar to prior studies, these "implied" trading results provide only weak evidence of persistence, and more importantly, this persistence is only apparent for low-skill managers. These results highlight the importance of identifying intra-quarter trades in our investigation, and suggest that prior studies using quarterly data have likely understated the investment skill of institutional portfolio managers.

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Table 1
Descriptive Statistics for Abel Noser Institutional Trading Data

Table 1 presents descriptive statistics for the Abel Noser institutional trading data. The trades in the sample are placed by 840 different institutional clients (3,816 different portfolio managers) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP).

	1999	2000	2001	2002	2003	2004	2005
Total Number of Managers	1,846	1,699	1,733	1,717	1,600	1,545	1,241
Total Number of Institutions	382	376	404	430	405	406	376
Total Number of Stocks	6,150	5,906	5,082	4,692	4,736	4,927	4,763
Total Number of Trades (millions)	5.64	7.56	9.05	12.32	12.35	21.43	19.10
Total Share Volume (billion)	50.69	73.44	100.99	135.04	112.30	155.92	127.40
Total Dollar Volume ($trillion)	2.25	3.20	3.06	3.23	2.76	4.46	3.95
Average Share Volume Per Trade	8,988	9,714	11,159	10,961	9,093	7,276	6,669
Median Share Volume Per Trade	1,700	1,500	1,400	1,300	1,050	700	453
Average Dollar Volume Per Trade	398,803	423,726	337,633	262,359	223,126	208,027	206,902
Median Dollar Volume Per Trade	60,030	54,970	39,200	30,300	27,297	20,568	14,232

Table 2
Intra-Quarter Stock Price Movements, 1999-2005

Table 2 reports the mean and median of three statistics that capture intra-quarter stock price movements. p^{max} is the highest daily closing price for each stock in each quarter. p^{min} is the lowest daily closing price for each stock in each quarter. p^{end} is the closing price for each stock on the last trading day of each quarter. The sample period is from 1999 to 2005. Daily stock prices and returns are from CRSP. The sample includes only common stocks (those with a sharecode of 10 or 11). We divide all sample stocks into five quintiles based on beginning of the quarter market capitalization. Numbers in parentheses are medians. All numbers are in percent.

	Mean (Median) Intra-Quarter Price Movements (%)		
	$log(p^{max}) - log(p^{min})$	$log(p^{max}) - log(p^{end})$	$log(p^{min}) - log(p^{end})$
All	41.42 (31.67)	21.27 (11.75)	-20.15 (-13.86)
By Year			
1999	43.25 (35.36)	21.37 (14.99)	-21.88 (-13.72)
2000	53.90 (42.18)	31.08 (18.66)	-22.82 (-16.52)
2001	50.39 (40.06)	26.98 (14.77)	-23.41 (-15.86)
2002	43.76 (33.44)	24.92 (14.49)	-18.84 (-13.53)
2003	35.02 (27.46)	13.73 (8.12)	-21.29 (-15.00)
2004	29.05 (23.51)	12.31 (6.32)	-16.73 (-12.87)
2005	27.02 (21.92)	13.31 (7.94)	-13.71 (9.79)
By Firm Size			
1 – small	53.78 (43.43)	29.67 (19.42)	-24.11 (-15.50)
2	42.21 (33.17)	22.37 (12.62)	-19.84 (-12.92)
3	41.74 (33.16)	21.66 (11.85)	-20.58 (-14.46)
4	38.76 (30.20)	18.59 (9.88)	-20.17 (-14.99)
5 – large	31.35 (24.21)	14.81 (8.02)	-16.54 (-12.39)

Table 3
Performance of Intra-Quarter Round-Trip Trades

Table 3 presents the performance of intra-quarter round-trip trades. The trades in the sample are placed by 3,816 portfolio managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). We calculate raw returns for each round-trip trade as the percentage difference between sell price and buy price. DGTW adjusted return is raw return less DGTW benchmark return over the identical holding period. We calculate principal-weighted average raw and DGTW adjusted returns across all intra-quarter round-trip trades for each manager and each quarter. We then take a simple average across all managers and quarters. We exclude a manager from a quarter if she has fewer than 5 round-trip trades in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

Panel A: By Manager Type

	All	Pension Plans	Money Managers
Raw Return	2.45 (28.05)	2.52 (26.47)	1.78 (11.90)
DGTW adj. Return	1.68 (25.19)	1.72 (23.61)	1.28 (13.03)
% of intra-quarter round-trip trades	22.89	18.30	33.65

Panel B: By Year

	1999	2000	2001	2002	2003	2004	2005
Raw Return	4.17 (13.82)	3.07 (12.16)	2.57 (10.33)	0.53 (2.55)	3.24 (19.32)	1.55 (10.77)	1.82 (12.10)
DGTW adj. Return	3.36 (11.32)	2.38 (13.49)	1.65 (11.02)	0.46 (3.58)	1.58 (13.64)	1.04 (9.49)	1.01 (9.57)

Table 4
Persistence of Performance of Intra-Quarter Round-Trip Trades

Table 4 examines the persistence of performance of intra-quarter round-trip trades. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). We measure the performance of intra-quarter round-trip trades by using the raw return of the trade less the DGTW benchmark return. We calculate principal-weighted average returns across all intra-quarter round-trip trades for each manager and each quarter. At the end of the each quarter, we divide all managers into five quintiles based on the DGTW adjusted returns for their round-trip trades. We then report the average DGTW adjusted returns for these quintiles in the next four quarters. We exclude a manager from a quarter if it has fewer than 5 round-trip trades in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

	Quarters			
Current Quarter Performance Quintiles	Q+1	Q+2	Q+3	Q+4
q1	-1.31	-1.16	-0.98	-1.10
	(-6.99)	(-6.19)	(-4.29)	(-5.32)
q2	0.26	0.61	0.72	0.24
	(2.25)	(3.38)	(5.48)	(1.95)
q3	1.53	1.51	1.17	1.22
	(12.12)	(12.42)	(9.75)	(9.11)
q4	2.59	2.52	2.67	2.27
	(22.09)	(20.41)	(15.16)	(15.33)
q5	4.73	4.40	4.00	3.74
	(25.63)	(22.45)	(20.07)	(22.38)
q5 – q1	**6.04**	**5.56**	**4.98**	**4.84**
	(22.93)	(20.51)	(16.43)	(18.22)

Table 5
Interim Trading Skills of Institutional Investors

Table 5 presents the interim trading skills of institutional investors. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each trade, we calculate the raw cumulative stock return from the execution price until the end of the quarter by marking the position to market at the quarter-end closing price. We adjust this raw cumulative return by the DGTW benchmark return over the same period. For each manager in each quarter, we then compute the equal-weighted or principal-weighted DGTW adjusted returns separately for buys and sells. Finally, we take the difference in DGTW adjusted returns between buys and sells. We report a simple average across all managers and quarters. We exclude a manager from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

Panel A: By Manager Type

	All	Pension Plans	Money Managers
Equal-weighted DGTW adj. Return			
Buy	0.70 (24.44)	0.72 (23.63)	0.44 (7.73)
Sell	-0.22 (-7.54)	-0.23 (-7.35)	-0.12 (-1.83)
Buy-Sell	0.91 (25.00)	0.94 (24.20)	0.55 (7.65)
Principal-weighted DGTW adj. Return			
Buy	0.54 (19.20)	0.55 (18.50)	0.39 (5.97)
Sell	-0.13 (-4.33)	-0.12 (-3.82)	-0.24 (-3.53)
Buy-Sell	0.67 (18.23)	0.67 (17.28)	0.63 (7.47)

Panel B: By Year

	1999	2000	2001	2002	2003	2004	2005
DGTW adj. Return *Equal-weighted*	1.00 (8.10)	1.24 (10.25)	1.09 (11.42)	0.89 (9.78)	0.85 (11.76)	0.62 (10.11)	0.60 (9.05)
DGTW adj. Return *Principal-weighted*	0.64 (4.85)	0.79 (6.46)	0.68 (7.60)	0.89 (10.69)	0.71 (10.72)	0.46 (7.13)	0.43 (6.23)

Table 6
Persistence of Interim Trading Skills

Table 6 examines the persistence of interim trading skills. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each trade, we calculate the raw cumulative stock return from the execution price until the end of the quarter by marking the position to market at the quarter-end closing price. We adjust this cumulative return by the DGTW benchmark return over the same period. For each manager in each quarter, we then compute the principal-weighted DGTW adjusted returns separately for buys and sells. Finally, we take the difference in DGTW adjusted returns between buys and sells. At the end of the each quarter, we divide all managers into five quintiles based on the principal-weighted DGTW adjusted returns for buys minus sells. We then report the average DGTW adjusted returns for these quintiles in the next four quarters. We exclude a manager from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

	Quarters			
Current Quarter Performance Quintiles	Q+1	Q+2	Q+3	Q+4
q1	-0.19	-0.16	-0.21	-0.26
	(-1.88)	(-1.54)	(-1.95)	(-2.53)
q2	0.33	0.56	0.39	0.37
	(4.29)	(7.06)	(4.17)	(4.38)
q3	0.64	0.61	0.47	0.71
	(8.29)	(7.75)	(5.98)	(8.61)
q4	1.04	0.95	0.91	0.88
	(13.40)	(11.47)	(10.65)	(10.72)
q5	1.82	1.67	2.02	1.91
	(18.33)	(14.89)	(18.12)	(17.22)
q5 – q1	**2.01**	**1.83**	**2.23**	**2.17**
	(14.23)	(12.05)	(14.31)	(14.28)

Table 7
Persistence of Interim Trading Skills - Pension Plan Sponsors vs. Money Managers

Table 7 examines the persistence of interim trading skills for pension plan sponsors and money managers separately. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each trade, we calculate the raw cumulative stock return from the execution price until the end of the quarter by marking the position to market at the quarter-end closing price. We adjust this cumulative return by the DGTW benchmark return over the same period. For each manager in each quarter, we then compute the principal-weighted DGTW adjusted returns separately for buys and sells. Finally, we take the difference in DGTW adjusted returns between buys and sells. At the end of the each quarter, we divide all managers into five quintiles based on the principal-weighted DGTW adjusted returns for buys minus sells. We then report the average DGTW adjusted returns for these quintiles in the next four quarters. We exclude a manager from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

Panel A: Pension Plan Sponsors

Current Quarter Performance Quintiles	Quarters			
	Q+1	Q+2	Q+3	Q+4
q1	-0.19	-0.19	-0.21	-0.27
	(-1.80)	(-1.76)	(-1.87)	(-2.45)
q2	0.33	0.59	0.40	0.41
	(4.02)	(6.95)	(3.91)	(4.53)
q3	0.61	0.60	0.46	0.72
	(7.44)	(7.10)	(5.39)	(8.05)
q4	1.06	0.95	0.94	0.86
	(12.75)	(10.67)	(10.18)	(9.74)
q5	1.87	1.75	2.07	2.00
	(17.88)	(14.81)	(17.89)	(17.18)
q5 – q1	**2.06**	**1.94**	**2.28**	**2.27**
	(13.83)	(12.15)	(13.94)	(14.22)

Panel B: Money Managers

Current Quarter Performance Quintiles	Quarters			
	Q+1	Q+2	Q+3	Q+4
q1	0.00	0.14	0.07	0.013
	(0.01)	(0.55)	(0.24)	(0.46)
q2	0.29	0.28	0.04	-0.08
	(1.91)	(1.59)	(0.24)	(-0.36)
q3	0.71	0.57	0.50	0.41
	(4.67)	(3.81)	(2.87)	(2.28)
q4	0.65	0.58	0.87	0.86
	(3.72)	(3.52)	(5.26)	(5.23)
q5	1.35	1.14	1.16	0.86
	(6.21)	(4.47)	(4.72)	(3.32)
q5 – q1	**1.35**	**1.00**	**1.09**	**0.73**
	(4.13)	(2.79)	(2.91)	(1.97)

Table 8
Persistence of Interim Trading Skills – Institutional Level Evidence

Table 8 examines the persistence of interim trading skills at the institution level. The trades in the sample are placed by 840 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each trade, we calculate the raw cumulative stock return from the execution price until the end of the quarter by marking the position to market at the quarter-end closing price. We adjust this cumulative return by the DGTW benchmark return over the same period. For each institution in each quarter, we then compute the principal-weighted DGTW adjusted returns separately for buys and sells. Finally, we take the difference in DGTW adjusted returns between buys and sells. At the end of the each quarter, we divide all institutions into five quintiles based on the principal-weighted DGTW adjusted returns for buys minus sells. We then report the average DGTW adjusted returns for these quintiles in the next four quarters. We exclude an institution from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

	Quarters			
Current Quarter Performance Quintiles	Q+1	Q+2	Q+3	Q+4
q1	0.02	0.18	0.12	0.18
	(0.19)	(1.64)	(1.03)	(1.82)
q2	0.34	0.51	0.45	0.39
	(4.64)	(6.54)	(5.46)	(4.64)
q3	0.65	0.60	0.56	0.56
	(9.03)	(8.43)	(7.30)	(7.01)
q4	0.83	0.66	0.73	0.86
	(10.98)	(8.16)	(9.18)	(10.33)
q5	1.26	1.05	1.16	1.21
	(11.58)	(10.22)	(10.22)	(11.49)
q5 – q1	**1.24**	**0.87**	**1.04**	**1.03**
	(8.54)	(5.81)	(6.35)	(7.20)

Table 9
Interim Trading Skills of Institutional Investors – Large vs. Small Stocks

Table 9 presents the interim trading skills of institutional investors for large and small stocks separately. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each trade, we calculate the raw cumulative stock return from the execution price until the end of the quarter by marking the position to market at the quarter-end closing price. We adjust this cumulative return by the DGTW benchmark return over the same period. For each manager in each quarter, we divide all trades by the median NYSE market capitalization and compute the equal-weighted or principal-weighted DGTW adjusted returns separately for buys and sells. Finally, we take the difference in DGTW adjusted returns between buys and sells. We report a simple average across all managers and quarters for large stocks in Panel A, and for small stocks in Panel B. At the end of the each quarter, we divide all institutions into five quintiles based on the principal-weighted DGTW adjusted returns for buys minus sells for large and small stock trades separately. We then report the average DGTW adjusted returns for these quintiles in the next four quarters. Persistence results for large stocks are presented in Panel C, and persistence results for small stocks are presented in Panel D. We exclude a manager from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

Panel A: Average Interim Trading Skills in Large Stocks

	All	Pension Plans	Money Managers
DGTW adj. Return	0.89	0.91	0.60
Equal-weighted	(21.24)	(20.45)	(7.35)
DGTW adj. Return	0.70	0.69	0.74
Principal-weighted	(15.60)	(14.65)	(7.03)

Panel B: Average Interim Trading Skills in Small Stocks

	All	Pension Plans	Money Managers
DGTW adj. Return	0.95	0.97	0.74
Equal-weighted	(7.05)	(6.53)	(3.86)
DGTW adj. Return	0.71	0.70	0.75
Principal-weighted	(5.18)	(4.66)	(3.41)

Panel C: Persistence of Interim Trading Skills in Large Stocks

Current Quarter Performance Quintiles	Quarters			
	Q+1	Q+2	Q+3	Q+4
q1	0.32	0.31	0.19	0.07
	(2.89)	(2.86)	(1.64)	(0.63)
q2	0.54	0.79	0.59	0.47
	(6.69)	(9.71)	(6.58)	(5.40)
q3	0.64	0.72	0.54	0.73
	(8.55)	(8.74)	(6.21)	(8.16)
q4	1.19	0.86	0.88	0.95
	(14.61)	(10.02)	(9.37)	(10.35)
q5	1.46	1.45	1.89	1.86
	(13.12)	(12.26)	(15.33)	(15.22)
q5 – q1	**1.14**	**1.14**	**1.70**	**1.79**
	(7.24)	(7.04)	(10.12)	(10.98)

Panel D: Persistence of Interim Trading Skills in Small Stocks

Current Quarter Performance Quintiles	Quarters			
	Q+1	Q+2	Q+3	Q+4
q1	-0.74	-0.31	-0.18	0.16
	(-2.88)	(-1.04)	(-0.58)	(0.66)
q2	0.35	0.73	0.39	0.41
	(1.73)	(3.60)	(1.52)	(1.68)
q3	0.88	1.17	1.28	1.27
	(4.56)	(4.88)	(6.53)	(6.13)
q4	2.11	2.02	2.03	1.47
	(8.97)	(8.77)	(8.79)	(6.03)
q5	3.79	2.93	3.36	2.72
	(15.24)	(10.53)	(10.80)	(9.55)
q5 – q1	**4.53**	**3.24**	**3.54**	**2.56**
	(12.66)	(8.00)	(8.13)	(6.76)

Table 10
Implied Quarterly Trading Performance of Institutional Investors

Table 10 presents the implied quarterly trading performance of institutional investors. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each portfolio manager, we track all trades within the quarter and calculate the net trading position for each stock as of the quarter end. We then calculate the DGTW equal- and principal-weighted abnormal performance for buys (positive net trading imbalance) and sells (negative trading imbalance) over the subsequent quarter. Finally, we take the difference in DGTW adjusted returns between buys and sells. We report a simple average across all managers and quarters. We exclude a manager from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

Panel A: By Manager Type

	All	Pension Plans	Money Managers
DGTW adj. Return	-0.31	-0.34	-0.08
Equal-weighted	(-7.26)	(-7.20)	(-1.03)
DGTW adj. Return	-0.33	-0.35	-0.08
Principal-weighted	(-6.15)	(-6.18)	(-0.66)

Panel B: By Year

	1999	2000	2001	2002	2003	2004	2005
DGTW adj. Return	0.56	-0.22	-1.21	-0.44	-0.30	-0.25	-0.12
Equal-weighted	(4.21)	(-1.42)	(-9.35)	(-4.50)	(-4.11)	(-3.81)	(-1.60)
DGTW adj. Return	0.51	-0.46	-1.03	-0.16	-0.43	-0.40	-0.20
Principal-weighted	(2.88)	(-2.44)	(-6.55)	(-1.29)	(-4.62)	(-4.82)	(-1.95)

Table 11
Persistence of Implied Quarterly Trading Performance

Table 11 presents the persistence of implied quarterly trading performance of institutional investors. The trades in the sample are placed by 3,816 managers (840 different institutional clients) of Abel Noser during the time period from January 1, 1999 to December 31, 2005. The sample includes only common stocks (those with a sharecode of 10 or 11 in CRSP database). For each portfolio manager, we track all trades within the quarter and calculate the net trading position for each stock as of the quarter end. We then calculate the DGTW equal- and principal-weighted abnormal performance for buys (positive net trading imbalance) and sells (negative trading imbalance) over the subsequent quarter. Finally, we take the difference in DGTW adjusted returns between buys and sells. At the end of each quarter, we divide all portfolio managers in to five quintiles based on their principal-weighted implied quarterly trading performance. We then report the average implied quarterly trading performance for these quintiles in the next four quarters. We exclude a manager from a quarter if it has fewer than 20 buys or 20 sells in that quarter. All returns are in percent. Numbers in parentheses are *t*-statistics.

	Quarters			
Current Quarter Performance Quintiles	Q+1	Q+2	Q+3	Q+4
q1	-0.35	-0.51	-0.40	-0.62
	(-2.10)	(-2.81)	(-2.09)	(-3.41)
q2	-0.38	-0.33	-0.33	-0.29
	(-2.76)	(-2.26)	(-2.31)	(-1.97)
q3	-0.36	-0.27	-0.53	-0.54
	(-2.66)	(-1.91)	(-3.76)	(-3.79)
q4	-0.27	-0.43	-0.05	-0.62
	(-1.93)	(-3.01)	(-0.33)	(-3.86)
q5	-0.04	-0.00	-0.66	-0.02
	(-0.20)	(-0.02)	(-3.65)	(-0.11)
q5 – q1	0.31	**0.51**	-0.26	**0.60**
	(1.30)	(2.03)	(-1.01)	(2.25)