Valuable Information and Costly Liquidity: Evidence from Individual Mutual Fund Trades

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Until recently, all Canadian mutual funds were required to disclose all their individual trades, offering a unique and ideal laboratory to measure and analyze the cost and performance of mutual funds' trades. We find that active management delivers both cheaper trades and better subsequent performance for the Canadian funds in our sample, and that the dissipative effect of flow-driven transactions costs is primarily through forced sales. Fund size associates with both cheaper trades and better subsequent performance, and a series of trades predicts more price movement in the predicted direction, indicating the value to funds of keeping their trading anonymous.

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I. Introduction

Consumers throughout the world rely on the performance of their mutual funds, and this performance in turn depends on the cost and performance of the funds' trades. Consequently, there is an extensive empirical literature on this subject. Unfortunately, mutual-fund regulators have generally not required funds to report their trades, so this literature has had to make do with proprietary databases of voluntary trade disclosures where the fund's identity is not revealed, or with coarse proxies for trades derived from low-frequency (quarterly, at best) holdings data. For many years, however, the Ontario Securities Commission in Canada required all Canadian funds to disclose every trade as well as periodic holdings, and this paper uses these disclosures to address key questions that previous research has been unable to answer. We compile a database of these trades and link it to data on the funds on the one hand, and the traded stocks on the other. With these three linked databases we calculate the trades' cost and performance, and then determine the important influences on them.

While much research has examined influences on individual fund trades (e.g., Chan and Lakonishok, 1995; Keim and Madhavan, 1997; Chiyachantana, Jain, Jiang and Wood, 2004), the fact that most prior studies did not know the identity of the funds in their samples meant that measurement of fund-specific influences on trade costs and performance was not possible. For example, one influence of long-standing interest is cash flows into and out of the fund and the portfolio transactions necessitated by these flows. The attendant trading costs have long been recognized as a potential drag on fund performance (e.g. Edelen, 1999), and a drawback of the open-end structure in general. However, active fund managers have some latitude to avoid demanding liquidity where it is in short supply, so the net effect is an open question we can address by relating transaction costs to simultaneous flows.

Similar flow-related issues apply to the transactions costs of index funds. Index funds carry significant theoretical and empirical appeal as investment vehicles, but their managers are tightly constrained in what to trade and when, whether their trading needs arise from flows or from index changes (e.g. Keim, 1999; Blume and Edelen, 2004). Their lack of information should in principle bring them better spreads, if they can communicate their innocuous motives, but if it does not, they must demand liquidity regardless of available supply. So the net effect on trading costs is an open empirical question we can again take directly to the actual trading costs.

Another fund-related influence on trade cost and performance of considerable empirical and theoretical interest is the fund's size. In the view of Berk and Green (2004) and Lynch and Musto (2003), a fund's size is an endogenous response to the fund's apparent value-added, and this value addition could manifest as cheaper trade execution, or better subsequent performance. Similarly, in the view of Gervais, Lynch and Musto (2005), fund family size associates with higher managerial value-added, through its effect on the efficiency of managerial retention.

Looking ahead to our results, the key finding among trading costs is the value added by the freedom to provide liquidity. Active managers, despite the presumably higher information content of their trades, trade at *lower* cost than index managers. And flows are more costly when they necessitate sales, rather than purchases, consistent with the lesser freedom of a manager who must sell rather than buy. We also see lower transactions costs for larger funds, but not for larger fund families.

Turning to trade performance, we find a number of interesting results. First, the active managers in our sample significantly outperform the indexers, from which we can conclude that our active managers add value not only through lower execution costs but also through informed stock-picking. Second, we find that flows correlate badly with subsequent returns: inflows

correspond with flat or negative returns on stocks purchased, depending on the sample period, and outflows correspond to flat or positive returns on stocks sold. Third, both fund size and fund family size correspond with better trade performance. Lastly, we find that if a fund buys a stock it bought recently, its return going forward is higher, and the reverse holds for sells. This indicates the virtue of managers spreading their trades across brokers, so they don't infer the value of this information, and keep some of it.

After analyzing trading costs and performance separately, we relate the two, asking whether the performance of trades increases with their initial cost. The unconditional answer is that it does for buys but not for sells, but looking closer we see that it does for active funds, whether buying or selling, but index funds have the opposite experience: over the subsequent month, more expensive buys do worse, and more expensive sells do better. So again, the tight constraints of their forced trades hurt their bottom line.

The paper is in seven sections. Section II is a brief review of relevant literature, Section III describes the data, Section IV addresses trading costs, Section V addresses trade performance, Section VI relates costs to performance, and Section VII summarizes and concludes.

II. Literature Review

There is extensive interest in trading costs and their effect on performance of mutual funds. Various authors have estimated these costs from CDA/Spectrum holdings data showing quarterly levels, and therefore changes, of portfolio holdings. The test design in many of these studies, dating back to Grinblatt and Titman (1989), is to compare the returns of a portfolio assuming holdings were fixed for the quarterly period and compare this to the actual returns of the fund. Kacperczyk, Sialm, and Zheng (2005) find that the difference in the returns of a fund

with and without trading provides explanatory power for future returns and is persistent, suggesting that effective trading ability varies by fund and contributes to overall performance. Wermers (2000) uses holdings changes to infer funds transactions costs, and Bollen and Busse (2005) compare trading costs around the change to decimalization and find that active managers received a significant change in trading costs after decimalization compared to index funds. Frank, Poterba, Shackelford, and Shoven (2004) evaluate the cost of disclosing quarterly holdings by evaluating how profitable it is to mimic portfolio holdings of actively managed funds. Chalmers, Edelen, and Kadlec (1999) and Edelen, Evans, and Kadlec (2006) add to these findings of trading costs by comparing the holdings information with data on brokerage commissions found in the semi-annual N-SAR filings. They estimate that brokerage commissions add up to 0.30% of returns and spread costs are 0.47%. To arrive at the estimate of spread costs, the authors match the stocks held by mutual funds with the effective spread of the stock and use this as a proxy for cost.

There is another stream of literature – for example, Chan and Lakonishok (1995), Keim and Madhavan (1997) – which, like this paper, compute trade costs from directly-observed individual transactions. Using data from proprietary sources like the Plexus Group, these papers analyze how trade execution is related to the size of the trade and other stock-specific factors. The data also enable one to identify who initiates the trade and identify those requiring liquidity. The key contrast between those papers and ours is that those papers can identify a fund's intentions; for example, they can identify when two 10,000-share trades were actually part of a 20,000-share order. But because the funds in their data are anonymous, they can link trading activity only to general characteristics – mainly the investment style – of the traders. In this paper we do not observe the fund's trading intentions, only its outcomes; but because these

filings are entirely public, we can link the trades to any relevant information about the funds involved.

More recently, researchers (e.g. Chan et al, 2005, Foster et al, 2005, Gallagher et al, 2005) have used the *Portfolio Analytics Database*, which reports the trades of 34 Australian funds which volunteered some of their trading histories. While this is a small and biased sample, it can potentially contribute to understanding about the determinants of trading costs and performance. Foster et al (2005) show these trades are generally predictive of future performance, and Chan et al (2005) look for an effect of fund size on market impact costs and future performance, but find nothing significant. Gallagher et al (2005) examine trading around earnings announcements.

III. Data

Until June 2005, mutual funds in Canada were required to submit a "Statement of Portfolio Transactions" containing all individual transacations to the Ontario Securities Commission.[1] Under these regulations, mutual funds were required to report all their trades with a maximum 60-day delay on an annual and semi-annual basis. The law did not specify the precise content or form of these reports; consequently, reported data vary somewhat across fund families. The public filings by mutual funds are all available from SEDAR (www.sedar.com).

Our data contain all the trades of individual Canadian mutual funds reported in these "Statement of Portfolio Transactions" filed with regulators. We collected all the interim and annual statements of portfolio transactions dated between January 2001 and June 2004, yielding transaction data covering January 2001 through December 2003. For every trade the statements

[1] General Regulation of the Ontario's Securities Act, R. R. O. 1990 Reg 1015, Part IV s. 87-94. In June 2005, the requirement to report individual transactions was eliminated (NI 81-106).

contain the identity of the security traded, the number of shares traded, and the (Canadian) dollar value of the trade which enables us to back out the execution price of the trade (less commissions) by dividing the net dollar amount paid (or received) by the number of shares. The main limitation for our purposes is that only about 15% of funds report the dates of their transactions. This limitation does not impart any fund-specific bias to the usable sample, because families that don't report dates for one fund don't report them for any of their fund; but it might impart a bias at the fund family level. These documents are pdf files which necessitate a labor-intensive transfer to usable form. We use only those filings that include transaction dates, which were available for 293 mutual and pooled funds of which 210 could be matched with Morningstar.[2] Of these 210 mutual funds, we observe 336 fund/years of data. Our matched set represents about 15% of the total net assets of the entire Canadian mutual fund industry in 2004. The funds in our sample represent four broad investment categories: Canadian Equity (102 funds), US Equity (47 funds), International (21 funds), and Specialty Funds (40 funds).[3] The matched sample also contains 20 index funds, as identified by the name of the fund.

All trades for each of these funds were collected, but not all trades are in the final sample of the analysis, because we cannot match all trades to data sources for market prices for the traded stocks. Some of the stocks in our data were traded on markets outside Canada and the U.S. so we did not match these trades. If we matched the name of a traded stock with a CUSIP, we identified the trade as a good match only if the execution price derived from the statement of transactions lay between the maximum and minimum price for the day.

[2] We have not finished processing the entire database; these are the funds we have so far.
[3] Using Morningstar's category definitions, Canadian funds include Canadian Balanced, Canadian Dividend, Canadian Equity, Canadian Equity Pure, Canadian Tactical Asset Allocation , and Canadian Small Cap. US funds include US Equity, US Small and Mid-Cap, North American and High Yield. International funds include Emerging Markets, Global Balanced and Asset Allocation, Global Equity, and International Equity. Specialty funds include Healthcare, Financial Services, Natural Resources, Science and Technology, RealEstate, Precious Metals, and Miscellaneous.

All data for Canadian mutual funds come from Morningstar on a monthly frequency. These data include management expense ratios, historical fund returns, total net assets (which are aggregated across share classes for the same fund), sponsor identity, and fund category. In Table I, we provide summary information about the funds in the sample, averaging across each fund/month. In our sample, the average management expense ratio is 2.21%, the average total net assets for each fund is $300 million,[4] the total net assets of the sponsor is $18 billion, and the average monthly rate of return is 0.59%. For comparison to the overall industry, the average Canadian mutual fund has a management expense ratio of 2.48%, a total net asset size of $158 million, the sponsor net assets are $14.86 billion, and the monthly rate of return was 0.28%. Although a smaller sample of funds, it seems to be representative of the average funds in the industry. In looking at the trades for our matched fund, each fund trades on average 2140 times during the year.

Market-related data on the traded stocks come from four sources: Datastream, CRSP, TSX Trade and Quotes Data, and U.S. Trade and Quote Data. The daily information on market returns, stock returns, closing bid and ask prices used to calculate the spread, and market capitalization come from Datastream for Canadian stocks and CRSP for U.S. stocks. We compute daily average trading volume for the 20 days before the trade, volume-weighted average price (VWAP), and the minimum and maximum price using the transactions-level data from the Trade and Quotes (TAQ) data from the respective markets. In the event a stock trades on both the U.S. and Canadian exchanges, we assume the stock traded in Canada and match with the Canadian data. To convert U.S. prices to Canadian dollars, we use the daily exchange rate posted by the Bank of Canada. After some filtering to remove outliers and matching, we are left with

[4] All dollar figures in the paper are Canadian dollars.

99,988 buy trades (totaling $29.4 billion) and 67,061 sell trades (totaling $24.56 billion).[5] Just under half these sells and buys are trades in Canadian stocks and the rest are trades in U.S. stocks. The break-down of the sample is provided in Panel F of Table I.

Our price benchmark for determining the cost of a trade is VWAP, and we estimate buy trade costs as (*Trade Price – VWAP*) / *VWAP*; for sell trades we multiply the ratio by -1. Table II summarizes the estimated trading costs for our matched sample. Average trading costs for Canadian stocks are 14 bp for buys and 11 bp for sells while U.S. stocks have similar average costs of 14bp and 13bp. While these percentage trading are similar across the countries, the average dollar value of the trades is smaller for U. S. stocks; using the total dollar value of trades, these averages translate into an average dollar cost of $536 and $507 for the average buy and sell trade of a Canadian stock and $305 and $355 for U.S. stocks.[6]

Our first look at returns subsequent to trading reveals significant short-term predictive power that warrants further exploration. Table II reports that, among Canadian stocks, the average daily excess return over the next week is 4bp/day for buys, and −6bp/day after sells. Among U.S. stocks, the analogous figures are 3bp/day after buys and −3bp/day after sells.[7] The post-trade excess returns are all statistically significant, suggesting that the average trade is informed, at least about the near future.

[5] Because the underlying trade and quotes data in both countries have some reporting errors and to remove small priced stocks, we eliminate those trades where the maximum price was more than twice the minimum price in the same day and those stocks with prices below one dollar. There were also some extremely large trades in the data which exceeded 10 times the average trading volume. Because of these outliers, we constrain the trade size to be less than 0.009% of the market cap of the company and less than twice the trading volume over the preceeding 20 days. These cut-offs are the 99.5% and 99.9% cutoffs for each variable respectively.

[6] For example, for the Canadian buy trades, $\$536 = \frac{\$17.65bil \times 0.001405}{46131trades}$

[7] Excess returns are computed by subtracting the daily return of the TSX 300 Index for Canadian stocks and the daily return of the S&P 500 Index for U.S. stocks.

Lastly, Figures 1 through 5 plot the number of trades and trading costs through time. Figures 1 and 2 show how the total number of trades (before matching, since matching is not relevant for these figures) changes across days of the week for Canadian and U.S. stock trades. We plot the number of trades per day in 2001 to 2003 to control for holidays. Both diagrams show a distinct increase in the number of trades throughout the week where significantly more trades are executed on Fridays than on Mondays. These results support the findings in Lakonishok and Maberly (1990) who find a proxy for instituitonal trading increases over the week. Interestingly, trading costs *decrease* over the week (Figures 3 and 4).[[, suggesting that the Lakonishok and Maberly (1990) result may result at least in part from trading costs.. I'm not so sure about this – there is correlation, but no evidence of causation (the relation could go in either direction)]] Figure 5 plots the number of trades by month and we see a significant spike in trading in October which would be consistent with trading for tax purposes.

IV. Determinants of Trade Costs

We begin by estimating a model of the determinants of trade costs. A substantial literature has shown that institutional transactions costs are nontrivial and are influenced by a variety of factors at the level of the trade and at the level of the fund. (See, for example, Chan and Lakonishok (1995), Keim and Madhavan (1997), Chiyachantana, Jain, Jiang and Wood (2004).). Trade-level factors include variables that measure the difficulty of the trade (size of the trade, liquidity of the market for the traded stock), the trade venue (electronic, dealer, auction), and the trade direction (buy vs. sell). Fund-level variables are intended to capture the investment style of the institution (which determines the degree of urgency in their demand for immediacy of execution) or the

resources available to aid the trading process. We use the following variables to capture these trade cost determinants.

A. Trade- and Stock-Specific Variables

Research has shown that the price impact of a trade is composed of a variable component related to the size of a trade and a fixed component related to the bid-ask spread of the stock. Our spread variable *Spread* is the proportional bid-ask spread at the close of the day of the trade. Following previous research, we measure trade size relative to the number of outstanding shares; specifically *Trade/MktCap* is defined as the ratio of dollar value of shares traded to market capitalization and is stated in percent. We use two variables to capture market liquidity. The first, *LogMktCap,* is the log of the market capitalization of the traded stock and has been used extensively in previous research. The second variable measures the proportion of the company's outstanding shares that traded on a typical day in the period leading up to the trade. Specifically, *Vol/Shrout* is defined as the average daily trade volume for the traded stock, measured over the 20 trading days prior to the trade, divided by the stock's total shares outstanding. *CanUS* is an indicator variable that equals one if a Canadian stock, zero if a U.S. stock. Previous research has shown that trade costs vary across different market venues; this variable is intended to detect cost differences between the Toronto Stock Exchange (an electronic limit order book market) and US exchanges (future drafts will also distinguish between trades executed on Nasdaq (dealer) and NYSE (specialist/auction)). Finally, and unlike some recent studies using proprietary data that enable researchers to re-package individual trades together into a larger order (or block) corresponding to the trader's total desired trade size, the individual trades in our data cannot be identified as part of some larger order quantity. In an effort to determine whether

an individual trade is part of a larger trade program, we create an indicator variable *ClosePastTrade* which equals one if the fund traded the stock at any time during the week prior to the trade, zero otherwise. Finally, to capture differences in the combined effects of these variables in buying or selling situations, we estimate the regressions separately for buys and for sells.

B. Fund-Specific variables

In addition to trade- and stock-specific variables we include several fund-level variables. Because we know the identity of the funds in our sample we can clearly identify their investment style. Chan and Lakonishok (1995), Keim and Madhavan (1997) and others have shown that funds' investment styles influence their demands for immediacy and thus their resulting trade costs. The trades of active fund managers are motivated by information, but the degree of immediacy demanded depends on the speed at which the value of the information decays. Thus, momentum managers who are chasing short-term price trends display extreme demand for immediacy, while value-oriented managers (e.g., Warren Buffett), relying on information that is longer-lived, can be more patient in getting into a position and thereby display less demand for immediacy. These differing demands for immediacy will be reflected in differences in trade costs. The trades associated with portfolios that are tied to an underlying index are not motivated by information but, nevertheless, display a relatively high demand for immediacy as they attempt to minimize the deviation of their portfolio weights from the weights in the underlying index. We currently distinguish between index funds and non-index funds with the variable *Active* which equals one if the fund is not an index fund, zero otherwise. (Future drafts will employ finer distinctions between the investment styles of the non-index funds in our sample.)

Previous research finds that mutual fund costs are inversely related to fund size, suggesting a fixed component to costs and corresponding economies of scale (Colins and Mack (1997), Tufano and Sevick (1997), Chalmers, Edelen and Kadlec (1999), and Evans, Edelen, and Kadlec (2006)). Chalmers, Edelen and Kadlec find that the inverse relation is weaker when estimated with fund trade-related costs suggesting such economies of scale are less important for the more variable nature of costs associated with trading. But their estimated trade-related costs are approximated by trading implied by changes in quarterly holdings and are a coarse measure of costs. Our data on actual trades permit a cleaner estimation of the relation between trade-related costs and fund size. Our variable for fund size is *logTNA*, the log of the total net assets of the fund measured at the end of the month of the trade. We also include a variable to capture any further economies associated with a larger parent or sponsor organization – *logTNAsponsor* is the log of the total net assets of the fund sponsor measured at the end of the month of the trade.

Finally, we include a variable related to the net flow of investment in the fund. For a trade executed in month t, we measure *Flow* as $TNA_t - TNA_{t-1}(1+R_t)$ where TNA_t is the total net assets of the fund at the end of month t and R_t is the net rate of return for the fund during month t. We then distinguish between positive and negative net flows with the variable *FlowPos* defined to equal one if *Flow* is positive, zero otherwise.

C. Results

We model trade costs as a linear function of the variables described above and estimate the model separately for buys and sells using ordinary least squares for the January 2001 - June 2004 period. We report the estimated coefficients and t-values based on heteroskedasticity-consistent standard errors in Table III. The adjusted R^2 values are low, but most of the estimated

coefficients are significant and consistent with expectations based on the discussion above. As in previous research, the coefficient on *Trade/MktCap* is positive and significant for both buys and sells indicating larger trades are more expensive. The two variables measuring the liquidity of the market for the traded stock, *LogMktCap* and *Vol/Shrout*, are both negative and significant for buys, although only *LogMktCap* is significant for sells. Thus, stocks trading in less liquid markets are more expensive to trade. The coefficient on *spread* is positive but insignificant for the trades in our data. The insignificance could reflect the noisiness of closing quotes (future drafts will use value-weighted effective spreads, now being calculated). The coefficient on *ClosePastTrade* is negative and significant for both buys and sells, indicating that a gradual campaign to put on or take off a position associates with lower trading costs.

The effect of flows on trading costs reflects two opposing forces. On the one hand, flows create some urgency to trade: inflows require buys and outflows require sells. The urgency is likely higher in the outflow case, since the downside from not having cash to fund outflows is likely greater than the downside from not putting inflows to work quickly. On the other hand, flows allow funds to optimize across possible trades, providing rather than demanding liquidity if possible. This is likely more beneficial for inflows than outflows, because a manager picking a stock to buy is less constrained than a manager picking a stock to sell, as the latter can pick only from his current holdings, and some of these holdings may be costly to sell from a tax perspective. What we find is that *FlowPos* is insignificant for buys but significantly positive for sells, and in particular, in the last column we see that negative flows increase the cost of sells more than positive flows increase the cost of buys, bearing out the view that inflows create more urgency and allow less choice across stocks, both of which increase the manager's demand for liquidity and, thereby, increase costs.

The coefficient on *Active* is negative and significant for buys but insignificant for sells, suggesting that, other things equal, non-indexers have lower costs than indexers. This is not inconsistent with earlier results (e.g., Keim and Madhavan (1997)) and can be attributed to several factors. As described above, indexers have a high demand for immediacy in their efforts to match the underlying index. On the other hand, active value-oriented managers can trade patiently, often supplying liquidity and, thereby, enjoy relatively low trade costs. And other active strategies, other than momentum strategies, have incentives to camouflage their intentions (and, thus, the information motivating their trades) by breaking orders into smaller transactions with lower individual price impacts. It is plausible that the mixture of active managers in our non-index category contains a sufficiently large percentage of these kinds of active managers so that their average costs, controlling for the other variables in the model, are lower than for indexers.

Consistent with Chalmers, Edelen and Kadlec (1999) we find that the coefficient on *logTNA* is negative and significant for both buys and sells, indicating there are economies of scale in trading for the funds in our sample. However, the coefficient on *logTNAsponsor* is positive and marginally significant for both buys and sells, suggesting that such economies do not extend to the larger umbrella of the sponsoring organization. Finally, the coefficient on *CanUS* is negative and significant for both buys and sells, which could indicate a trading-cost advantage for Canadian managers trading Canadian stocks.

D. Herfindahl Results

In this subsection we repeat the regressions from Panel A of Table III with an additional regressor that captures the competition to make a market in the traded stock. This regressor is

the standard Herfindahl index, calculated from the concentration across brokers of the stock's trading volume. We can calculate this statistic for Canadian stocks because the Canadian TAQ data includes codes for the broker on each side of each trade.

The Herfindahl works as follows. If the firms active in a market are indexed by i and the market share of firm i is x_i, then the Herfindahl is $\Sigma_i(x_i)^2$. Thus, the Herfindahl increases toward 1 as the market concentrates. We apply this formula for a given stock and trading day by aggregating all trading in the stock over the previous twenty trading days, and then for each broker, summing all the shares of all trades for which it was a buyer, and adding all the shares for which it was a seller. Since we double count each trade, we divide the result by two times the total shares traded. This is the broker's market share we plug into the formula. We add this to the regression and remove the indicator CanUS, since the trades are all Canadian. The results are in Panel B of Table III.

The Herfindahl, we find, comes in negative, indicating a decrease in transactions costs as competition goes down. That is, controlling for the quoted spread and everything else, funds trade at better prices if competition to make the market is lower. What this suggests is that, to the extent that low competition widens spreads, funds eschew paying the spread with market orders and instead compete with limit orders.

V. Performance of Trades

A. Motivation for the tests

We are interested in the relation between the performance of the trades in our sample, as measured by post-trade market-adjusted returns on the traded stocks, and variables related to characteristics of the trade, the stock being traded, and the fund making the trade. To measure

trade performance, we compute for each trade in our sample the return for the traded stock in excess of the market return (the return on the TSX300 for Canadian shares, the return on the S&P500 for U.S. shares) for three post-trade intervals – one week (5 trade days) following the trade, one month (21 trade days) following the trade, and three months (63 trade days) following the trade. We regress these post-trade returns on trade-specific (*Trade/MktCap, ClosePastTrade*), stock-specific (*CanUS*), and fund-specific variables (*Active, FlowPos, LogTNA, LogTNAsponsor*) defined in section IV.

The trade-specific variables are intended to capture characteristics of the trade related to informational value – *Trade/MktCap* and *ClosePastTrade*. Past research (e.g., Easley and O'Hara, 1987) suggests that trade size is positively related to the information content of the trade. The second variable indicates that the individual trade was part of a larger desired order quantity by the fund for the stock and, therefore, conveys a possibly greater signal of informational value than suggested by its individual trade size.

The stock-specific variable (*CanUS*) is included to examine whether the geographic location of the company of the traded stock exhibits a relationship with post-trade returns. The geographic location of a company may be related to the quality of the information an investor has about the company's stock value. Specifically, the investor may be more familiar with, and have better information about, stocks domiciled close to the investor's home (e.g., Moskowitz and Coval (1999), Huberman (2001)). An implication is that Canadian fund managers may have a comparative advantage when investing in Canadian stocks.

The fund-specific variables are included to capture characteristics of the fund related to the probability of their being informed (*Active*), the extent to which flows into or out of the fund impact the relative proportion of informed versus liquidity-motivated trades (*FlowPos*), and the

degree to which the level of resources available to the fund manager contributes to an informational advantage (*LogTNA, LogTNAsponsor*). We expect the trades of index managers to be liquidity-motivated and, therefore, unrelated to post-trade returns. In contrast, the trades of non-index funds, if informed, will be related to post-trade returns. As Alexander, Cici and Gibson (2006) observe, positive flows oblige the manager to buy something, and this reduces the likely information content of the purchase, whereas positive flows reduce the pressure to sell something, thereby increasing the likely information content of any sells that do occur. Finally, funds and sponsoring organizations with more assets under management will have access to more resources and greater ability to identify valuable information. Thus, we expect that larger funds will produce trades with better subsequent performance.

In addition, we include two variables to control for observed market-wide patterns in returns related to size (Banz (1981)) and price momentum (Jegadeesh and Titman (1993)) that we don't want to attribute to manager skill. These variables are the log of the market capitalization of the traded stock (*LogMktCap*), and the market-adjusted return for the traded stock for the month (21 trade days) prior to the trade (*XRetLag1Mo*), adjusted for the TSX300 and S&P500, as described above.

B. Results

The results from our trade performance regressions are in Table IV. We estimate regressions separately for buy and sell trades; and for both buys and sells we estimate three separate regressions for our three post-trade return intervals. The controls for the size (*LogMktCap*) and momentum (*XRetLag1Mo*) effects are significant and in the expected

direction. As expected, momentum is more pronounced the longer is the post-trade return interval, but it is interesting that the momentum effect is more pronounced in the excess returns following buys than for sells.

Turning to the trade- and stock-specific variables, the coefficient on *Trade/MktCap* is negative and significant for buy trades, but only for one-week post-trade returns, and positive and significant for sells for all three post-trade intervals. This finding that larger trades underperform smaller trades in the short term, coupled with their being more expensive (from the previous section), is a pattern suggestive of a greater demand for immediacy for larger trades: the greater (absolute) post-trade returns following larger trades reflects a rebound from the larger temporary (i.e., liquidity) price concessions required to complete those trades. The inverse relation between trade size and performance might also be evidence that informed trades are optimally broken up into smaller-sized pieces for execution. The coefficient on *ClosePastTrade* is positive and significant for buys and negative and significant for sells for one-week market-adjusted returns, indicating that individual trades that are part of a larger trade program signal greater informational value than would be suggested by their individual trade sizes. Of course it is possible that the trade, if part of a larger order, may be followed by subsequent trades in the following week, so that the higher one-week post-trade excess return we observe simply reflects liquidity effects related to the fund's continued presence in the market. To control for this, we construct a variation on *ClosePastTrade, ClosePastTrade2*, defined to be equal to one if the fund traded the stock at any time during the week prior to the trade but *not* in the subsequent week, and zero otherwise. The coefficient on *ClosePastTrade2* for buys is positive and significant, and approximately twice the value of the coefficient on *ClosePastTrade* for one-week market-adjusted returns, so the positive subsequent return is not driven by future purchases by the same

fund. On the other hand, for sells *ClosePastTrade2* is insignificant. This is consistent with the future sells causing the negative return, but the causality could be the other direction; subsequent poor returns could encourage managers to sell again.

Finally, the coefficients on *CanUS* are negative and generally significant for both buys and sells across all post-trade return horizons, indicating that Canadian stock buys underperform U.S. stock buys for our sample of Canadian funds, whereas Canadian stock sells outperformed U.S. stock sells. Although the sell results speak to the Canadian funds' comparative advantage when trading Canadian stocks, the buy results are inconsistent with this. One possible reason for this could be an important factor in returns (e.g., value effect, which was strong in our sample period) for which we have not controlled (e.g., it is possible that the Canadian stocks bought and sold in our sample were more growth-oriented than the U.S. stocks).

The results for our fund-level variables are consistent with our predictions. The coefficient on *Active* is positive and significant for buys and negative and significant for sells, showing that the trades of non-indexers outperform the trades of indexers in our sample. As expected, this differential performance decays as the post-trade interval increases. The coefficients on *logTNA* and *logTNAsponsor* are positive and significant for buys and negative and significant for sells. This finding is consistent with our prediction that funds and sponsoring organizations with more assets under management have access to more resources and greater ability to identify valuable information and, therefore, will produce trades with better subsequent performance. We find that the magnitude and significance level of this effect declines with longer post-trade horizons. Finally, the coefficient on *FlowPos* is negative and significant for both buys and sells at post-trade intervals of one and three months indicating that, consistent with

Cici, Alexander and Gibson (2006), cash inflows do indeed increase the performance of sells and decrease the performance of buys.

VI. Relation between Trade Costs and Performance

In this section we ask whether there is a relation between the cost of a trade and its subsequent performance by modifying the trade performance model estimated in section V to include an estimate of the predicted cost of the trade. We compute the predicted trade cost *ExpTradeCost* using the parameters from the model of trade costs in section IV, estimated separately for buys and for sells, in conjunction with the trade- , stock- and fund-specific characteristics associated with each trade. We estimate the model using market-adjusted returns for the one-week and one-month post-trade intervals. The results are reported in Table V, separately for buys and sells.

The first column in each panel of Table V shows the results with the extended model that includes the predicted cost of the trade. The coefficient on *ExpTradeCost* is positive and significant with the exception of sells at the shorter post-trade horizon. Thus, higher trade costs are related to higher performance, suggesting an information as well as a liquidity component in predicted trade costs. This conjecture is confirmed in the second column where we add to the model an interaction term defined as (*ExpTradeCost* * *Active*) where active is defined as above. If trades of active funds are more informed than trades of indexers so that costs include a permanent price impact related to that information, then the coefficient on the interaction term will be positive and significant for the buys and negative and significant for the sells. We find this to be the case except for the short-term performance of the sells. We also find for the buy regressions that the coefficient on the non-interacted *ExpTradeCost* is now insignificant for one-week returns and significantly negative for one month returns, confirming that the liquidity

motivated trades of the indexers in our sample are not related to positive performance. The results for the sell regressions suggest a similar interpretation.

We find that adding *ExpTradeCost* and the interaction variable to the model does not, in general, change the estimated coefficients for the other variables or their significance levels. Two exceptions are *Active*, which is now insignificant due to the presence of the interaction term which incorporates this effect, and *CanUS* which is now insignificant for the buy regressions, and is negative and significant only for the sell regressions for the one-week post-trade return.

We also experimented with several additional specifications of the model with information-related interaction terms related to trade characteristics (*CloseTradePrice*) and fund characteristics (*TNA*, *FlowPos*). The results for these interaction variables were somewhat mixed and mostly insignificant. One exception is the interaction with TNA, intended to capture the greater informational advantage of larger funds, which is positive and significant for buys and negative and significant for sells, consistent with higher costs for these firms containing a significant information component.

VII. Conclusion

Canadian regulators provided a major and singular opportunity to discover the economics of mutual-fund trading when they required funds to disclose all their trades. This paper begins the discovery by taking the natural first questions to these data, asking where the cost and performance of trades come from.

In the costs of trades we see clearly the downsides of two popular features of the mutual-fund industry: indexing and the open-end structure. Indexing presumably eliminates much wasteful trading, but it also handcuffs traders, and consistent with previous research we observe poor execution relative to active managers with potentially more flexibility in their trading

operations.. The efficiencies of the open-end structure are also well-known but so is the potential for expensive trading frictions. We see those frictions, but we also see that forced buys are handled more cheaply than forced sells, in accordance with the looser constraints buyers face. Large funds trade more cheaply, maybe because size gives some economic advantage, or maybe because funds that trade well attract investors.

In the trades' future performance we again see indexers suffering in comparison to active traders, the trades associated with net flows doing poorly, and larger funds performing better. We also see the value of anonymity to fund managers: the return after an active manager's trade goes further in his direction if it follows another trade, showing the importance of keeping one's trading pattern to oneself.

This is a young project, and we are in the midst of expanding it on all dimensions. But it is already apparent that the Canadian mutual-fund industry, over the years of this disclosure policy, is an ideal resource for key questions about mutual-fund trading.

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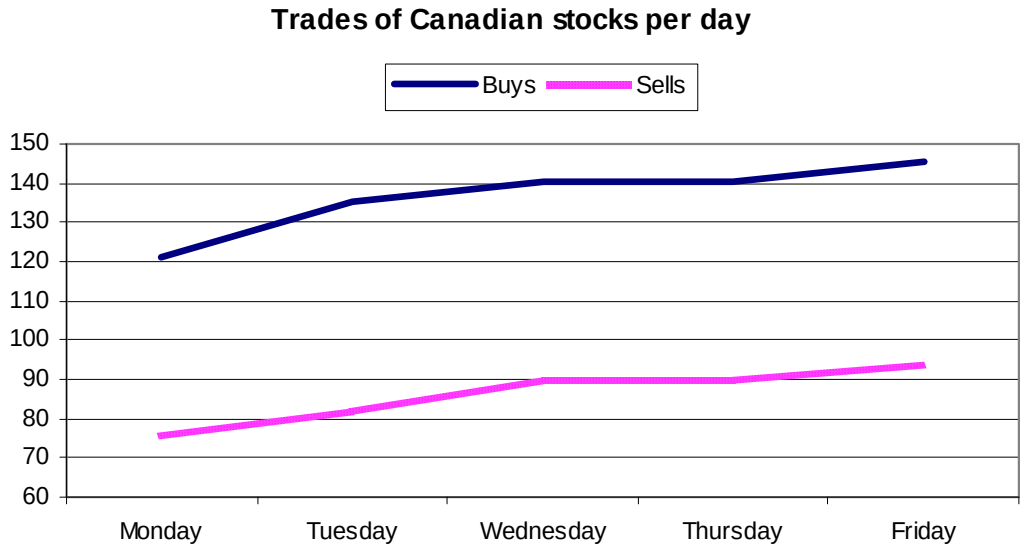

Figure 1. This plots the average number of trades in Canadian stocks per trading day in 2001 to 2003. This represents all trades of 293 Canadian mutual funds.

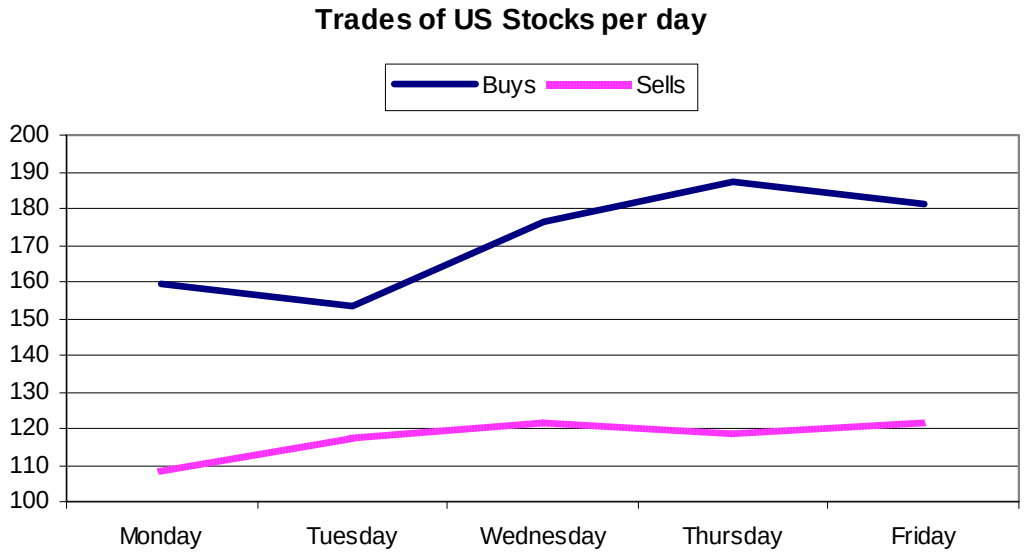

Figure 2. This plots the average number of trades in U.S. stocks per trading day in 2001 to 2003. This represents all trades of 293 Canadian mutual funds.

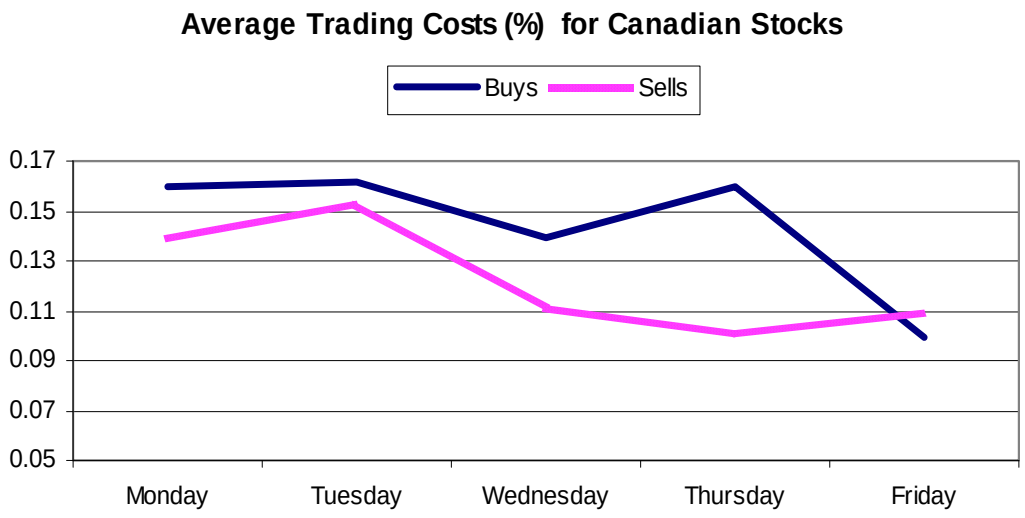

Figure 3. This plots average trading costs (in percent) of Canadian stocks between 2001-2003. This represents average costs of 105,755 trades for 293 mutual funds where trades were matched with underlying price information. Trading costs for buys are estimated as the difference of execution price from the value-weighted average price, VWAP, of all trades during the day divided by VWAP. Trading costs for sales are estimated estimated as the difference of value-weighted average price and execution divided by VWAP.

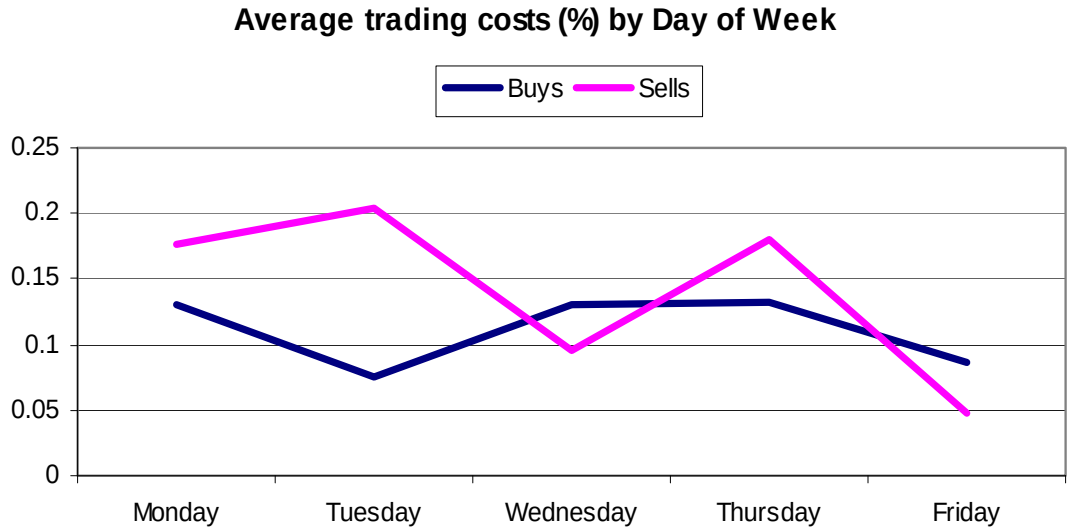

Figure 4. This plots average trading costs (in percent) of U.S. stocks between 2001-2003. This represents average costs of 124,699 trades for 293 mutual funds where trades were matched with underlying price information. Trading costs for buys are estimated as the difference of execution price from the value-weighted average price, VWAP, of all trades during the day divided by VWAP. Trading costs for sales are estimated estimated as the difference of value-weighted average price and execution divided by VWAP.

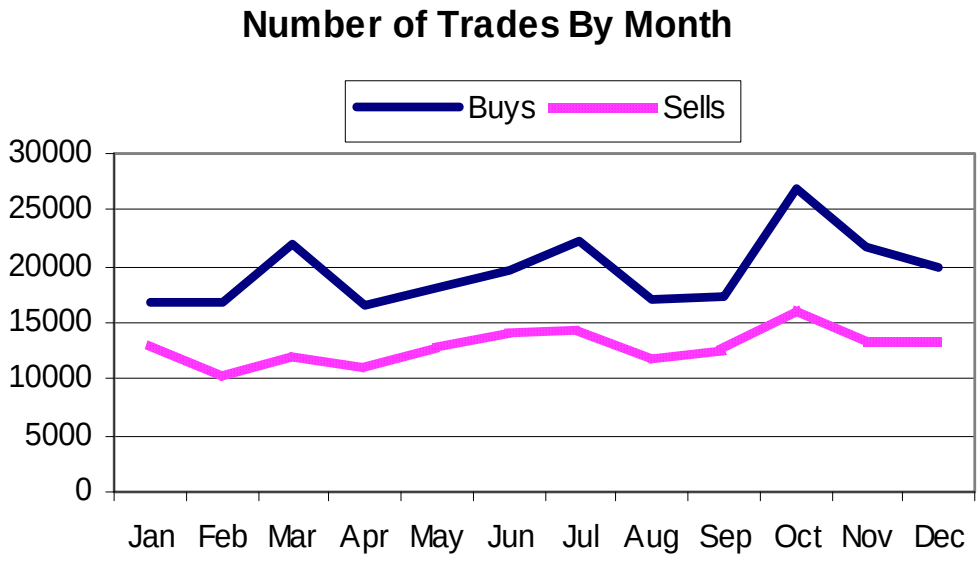

Figure 5. This plots the total number of trades in U.S. and Canadian for each month between 2001 to 2003. This represents all trades of 293 Canadian mutual funds.

Table I. Descriptive Statistics of Mutual Funds and Matched Sample

Panel A of this table reports summary statistics for sample of 210 mutual funds in Canada. All data on mutual funds was collected from Morningstar Canada. This subsample of mutual funds cover 15% of the Canadian mutual fund market. *TNA* is total net assets of the fund (aggregated across shareclasses) and *TNASponsor* is the total net assets of the sponsor of the fund. *MER* is the management expense ratio (in percent) for the fund. *Net Monthly Returns* are the monthly returns of the fund measured at the end of the month and deducting any expenses. All variables for the fund are available monthly and the averages are fund/month averages. Panel B shows how the data breaks down and the number of observations removed by matching and the removal of outliers.

Panel A: Fund Characteristics across fund/months						
	Obs	Average	Median	StDev	Min	Max
TNA ($millions)	3116	300.95	94.72	595.65	0.038	6690.71
TNA Sponsor ($billions)	3216	18.24	6.91	20.23	0.0013	75.01
MER (Annual)	2964	2.21	2.45	0.83	0	5.28
Net Monthly Returns (%)	3217	0.59	0.72	4.58	-31.52	31.72

Panel B: Break-down of Data and Matching			
	Unmatched Sample	Matched CRSP Remove Outliers	Matched CRSP/MSTAR Remove Outliers
Mutual Funds with Trades	293	293	210
Total Trades in sample	392269	230454	167100
Buys	235633	141099	100015
Sells	156636	89355	67085
Index Funds	25	25	20
Portion of Trades in Canadian Stocks (%)	43.7	45.9	46.3

Table II. Descriptive Statistics of Trading Costs

This table reports summary statistics for the trades in our sample of 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction between January 2001 and June 2004. The execution price of a trade is estimated as the net dollar value of the trade divided by the number of shares traded. Trading costs for each trade are estimated as the difference between the execution price, P, and the value-weighted average price (VWAP) for all trades throughout the day divided by VWAP. For buys and sells, trading costs, TC, are defined in percent as

$$TC_{buy} = \frac{(P - VWAP)}{VWAP} \text{ and } TC_{sell} = \frac{(VWAP - P)}{VWAP}.$$

Trade size is measured as both the dollar value of the trade divided by the market capitalization of the firm as well as the shares traded divided by the average trading volume in the preceding 20 days of the trade. The excess returns for one week ahead are the average compounded daily excess returns five trading days after the day of the trade. The log of daily excess returns are summed up across the five trading days and then divided by five. Each daily return is measured in logs and in excess of its respective market where the TSX300 index return is the market used for Canada and the S&P500 is used for the U.S. Similar average daily excess returns are calculated for 1 month (21 trading days) after the trade. The value-weighted average weights the variable by the relative size of the trade measured by the dollar value of the trade as a percent of the total dollar value traded.

Panel A: Buys of Canadian Stocks ($17.65 billion)

	Obs	Average	VWAvg	Median	StDev	Min	Max
Trading Cost (%)	46131	0.1401	0.1464	0.1431	1.06	-30.50	18.12
Number of Trades per month	46131	118	96	81	112.16	1	540
Avg Size of Trade (% Market Cap)	46131	0.0192	0.0566	0.0040	0.05	2.07E-07	0.893
Avg Size of Trade (% of Trading Volume)	46131	6.3339	12.5113	1.3535	14.25	2.78E-05	179.85
Avg Daily XS Returns 1 week ahead (%)	45993	0.0388	0.0312	0.0209	1.12	-14.03	11.11
Avg Daily XS Returns 1 month ahead (%)	45910	0.0193	0.0225	0.0216	0.55	-7.17	10.31

Panel B: Sells of Canadian Stocks ($14.616 billion)

	Obs	Average	VWAvg	Median	StDev	Min	Max
Trading Cost (%)	31235	0.1084	0.1048	0.1422	1.19	-31.97	28.57
Number of Trades per month	31235	84	87	64	71.68	1	353
Avg Size of Trade (% Market Cap)	31235	0.0250	0.0615	0.0056	0.06	9.47E-08	0.894
Avg Size of Trade (% of Trading Volume)	31235	7.3977	13.8632	1.6046	16.39	2.41E-05	177.14
Avg Daily XS Returns 1 week ahead (%)	30673	-0.0577	-0.0477	-0.0335	1.18	-18.40	19.23
Avg Daily XS Returns 1 month ahead (%)	30647	-0.0188	-0.0326	-0.0123	0.55	-5.18	7.72

Panel C: Buys of US Stocks ($11.736 billion)

	Obs	Average	VWAvg	Median	StDev	Min	Max
Trading Cost (%)	53884	0.1399	0.2333	0.1592	1.24	-39.07	39.47
Number of Trades per month	53884	182	121	98	240.24	1	1317
Avg Size of Trade (% Market Cap)	53884	0.0057	0.0234	0.0007	0.03	1.02E-08	0.889
Avg Size of Trade (% of Trading Volume)	53884	0.9035	2.9870	0.0877	4.75	4.95E-06	175.00
Avg Daily XS Returns 1 week ahead (%)	53879	0.0326	-0.0182	0.0409	1.15	-41.03	9.41
Avg Daily XS Returns 1 month ahead (%)	53837	0.0238	-0.0024	0.0437	0.57	-18.88	3.55

Panel D: Sells of US Stocks ($9.95 billion)

	Obs	Average	VWAvg	Median	StDev	Min	Max
Trading Cost (%)	35850	0.1281	0.1737	0.1383	1.32	-38.90	31.95
Number of Trades per month	35850	121	72	73	163.26	1	895
Avg Size of Trade (% Market Cap)	35850	0.0070	0.0267	0.0010	0.03	7.09E-08	0.842
Avg Size of Trade (% of Trading Volume)	35850	1.0579	3.2896	0.1148	5.15	5.40E-06	178.07
Avg Daily XS Returns 1 week ahead (%)	35829	-0.0273	0.0099	0.0034	1.21	-21.89	12.82
Avg Daily XS Returns 1 month ahead (%)	35780	-0.0018	-0.0340	0.0223	0.59	-12.50	4.65

Table III. Trading Cost Regression

Panel A

This table estimates trading costs of buys and sells for 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction between January 2001 and June 2004. The execution price of a trade is estimated as the net dollar value of the trade divided by the number of shares traded. Trading costs for each trade are estimated as the difference between the execution price, P, and the value-weighted average price (VWAP) for all trades throughout the day divided by VWAP. For buys and sells, trading costs, TC, are defined in percent as

$$TC_{buy} = \frac{(P - VWAP)}{VWAP} \text{ and } TC_{sell} = \frac{(VWAP - P)}{VWAP}.$$

CanUS is an indicator which takes the value 1 if the stock is traded in Canada and 0 if the stock is traded in the U.S. In the case of cross-traded securities, we assume the default market is Canada. *Active* takes the value 1 if a fund was actively managed and 0 if a fund was an index fund. *ClosePastTrade* takes the value 1 if a trade occurred within 5 trading days of another trade in the same stock at the same fund and 0 otherwise. *LogMktCap* is the log of a firm's market capitalization which is the closing price multiplied by the number of shares each day. *Vol/Shrout* is the average volume of shares trading in the market for the 20 days before the trade divided by the shares outstanding of the firm. *$Trade/MktCap* is the dollar value of the trade divided by the market capitalization of the firm. *LogTNA* is the log of the total net assets of the fund (aggregated across shareclasses) and *LogTNASponsor* is the log of the total net assets of the sponsor of the fund. Total net assets for both the sponsor and fund are reported for the month of the trade. *Spread* is the difference between the closing ask and bid price for the stock divided by the midpoint and is expressed as a percent. *FlowPos* takes the value 1 if the flow into the fund in the month of the trade is positive and 0 otherwise. Fund flow is the difference of total net asset, TNA, at the end of the month coinciding with the trade less the previous month's TNA adjusted for returns, $TNA_{t-1}(1+R_t)$ and divided by last month's TNA. Huber/White adjusted standard errors are reported to adjust for heteroskedasticity. The last two columns provide the difference in coefficients between sells and buys, CoefSells - CoefBuys. For the difference in coefficients on *FlowPos,* the reported difference is –CoefSells – CoefBuys. Huber/White adjusted p-values are reported for each difference test.

	Buys		Sells		Coefficient Difference	
	Coef	t-stat	Coef	t-stat	Sells - Buys	p-value
CanUS	-0.0492	-4.79	-0.045594	-3.52	0.0036	0.829
Active	-0.1543	-8.87	-0.031585	-1.70	0.1227	0.000
ClosePastTrade	-0.0403	-5.24	-0.049371	-4.93	-0.0091	0.473
LogMktCap	-0.0241	-8.94	-0.008327	-1.96	0.0157	0.002
Vol/Shrout	-1.4230	-2.18	-0.983876	-1.30	0.4391	0.660
Trade/MktCap	112.6958	7.68	65.051824	4.05	-47.6440	0.029
LogTNA	-0.0164	-7.53	-0.020941	-6.37	-0.0046	0.248
LogTNASponsor	0.0057	1.97	0.007501	1.82	0.0018	0.726
Spread	0.0020	0.25	0.0172623	0.90	0.0152	0.465
FlowPos	-0.0076	-0.89	-0.04215	-3.81	0.0497	0.000
Intercept	0.8915	12.18	0.425452	3.72	-0.4661	0.000
Obs	94549		63522			
R-squared	0.0054		0.0031			

Panel B: Herfindahl Results

This panel estimates trading costs of buys and sells for 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction between January 2001 and June 2004. The execution price of a trade is estimated as the net dollar value of the trade divided by the number of shares traded. Trading costs for each trade are estimated as the difference between the execution price, P, and the value-weighted average price (VWAP) for all trades throughout the day divided by VWAP. For buys and sells, trading costs, TC, are defined in percent as

$$TC_{buy} = \frac{(P - VWAP)}{VWAP} \text{ and } TC_{sell} = \frac{(VWAP - P)}{VWAP}.$$

Active takes the value 1 if a fund was actively managed and 0 if a fund was an index fund. *ClosePastTrade* takes the value 1 if a trade occurred within 5 trading days of another trade in the same stock at the same fund and 0 otherwise. *LogMktCap* is the log of a firm's market capitalization which is the closing price multiplied by the number of shares each day. *Vol/Shrout* is the average volume of shares trading in the market for the 20 days before the trade divided by the shares outstanding of the firm. *$Trade/MktCap* is the dollar value of the trade divided by the market capitalization of the firm. *LogTNA* is the log of the total net assets of the fund (aggregated across shareclasses) and *LogTNASponsor* is the log of the total net assets of the sponsor of the fund. Total net assets for both the sponsor and fund are reported for the month of the trade. *Spread* is the difference between the closing ask and bid price for the stock divided by the midpoint and is expressed as a percent. *FlowPos* takes the value 1 if the flow into the fund in the month of the trade is positive and 0 otherwise. Fund flow is the difference of total net asset, TNA, at the end of the month coinciding with the trade less the previous month's TNA adjusted for returns, $TNA_{t-1}(1+R_t)$ and divided by last month's TNA. Huber/White adjusted standard errors are reported to adjust for heteroskedasticity. *Herfindahl* is the Herfindahl index of concentration across brokers of trading in the stock. Only Canadian trades are represented in this panel.

	Buys		***Sells***	
	Coef	**t-stat**	**Coef**	**t-stat**
Active	-0.194	-10.89	-0.0858	-4.23
ClosePastTrade	0.0026	0.23	-0.0284	-2.02
LogMktCap	-0.03	-6.26	-0.028	-3.37
Vol/Shrout	-4.376	-2.74	-5.942	-3.33
Trade/MktCap	82.946	5.72	89.94	4.81
LogTNA	-0.028	-6.74	-0.0307	-5.26
LogTNASponsor	0.0052	1.20	0.0121	2.10
Spread	1.2703	0.99	-2.851	-0.98
FlowPos	-0.024	-1.97	-0.0117	-0.71
Herfindahl	-0.198	-3.15	-0.2274	-2.44
Index	1.1142	9.18	0.9229	4.62
Obs	44032		29899	
R-squared	0.0114		0.0065	

Table IV. Information in Trades Regression

This table estimates future excess daily returns of buy and sell trades for 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction from January 2001 and June 2004. The excess returns for one week ahead are the average compounded daily excess returns (in percent) five trading days after the day of the trade. The log of daily excess returns are summed up across the five trading days and then divided by five. Each daily return is measured in logs and in excess of its respective market where the TSX300 index return is the market used for Canada and the S&P500 is used for the U.S. Similar average daily excess returns are calculated for 1 month (21 trading days) and 3 months (63 trading days) after the trade. *CanUS* is an indicator taking the value 1 if the stock is traded in Canada and 0 if the stock is traded in the U.S. In the case of cross-traded securities, we assume the default market is Canada. *Active* takes the value 1 if a fund was actively managed and 0 if a fund was an index fund. *ClosePastTrade* takes the value 1 if a trade occurred within 5 trading days of another trade in the same stock at the same fund and 0 otherwise. *ClosePastTrade2* takes the value 1 if a trade occurred within 5 trading days of another trade in the same stock at the same fund and there are no trades in the same stock for the same fund for 5 trading days after the trade. *LogMktCap* is the log of a firm's market capitalization which is the closing price multiplied by the number of shares each day. *Trade/MktCap* is the dollar value of the trade divided by the market capitalization of the firm. *LogTNA* is the log of the total net assets of the fund (aggregated across shareclasses) and *LogTNASponsor* is the log of the total net assets of the sponsor of the fund. Total net assets for both the sponsor and fund are reported for the month of the trade. *Spread* is the difference between the closing ask and bid price for the stock divided by the midpoint. *FlowPos* takes the value 1 if the flow into the fund in the month of the trade is positive and 0 otherwise. Fund flow is the difference of total net asset, TNA, at the end of the month coinciding with the trade less the previous month's TNA adjusted for returns, $TNA_{t-1}(1+R_t)$ and divided by last month's TNA. *XSReturn Lagged 1 Month* is the lagged compounded excess return in percent for the stock in the 21 trading preceding the trade (excluding the return on the trade day). T-statistics are reported in italics below each coefficient and use Huber/White adjusted standard errors adjust for heteroskedasticity. Panel A reports future returns for buy trades and Panel B reports future returns for sell trades.

Panel A: Future Returns of Buy Trades

	Average Daily Excess Returns Looking Forward					
	1 week		**1 month**		**3 month**	
CanUS	-0.010	-0.011	-0.018	-0.019	-0.025	-0.026
	-1.197	*-1.244*	*-4.335*	*-4.380*	*-10.493*	*-10.609*
Active	0.129	0.134	0.065	0.066	0.032	0.031
	9.130	*9.532*	*8.944*	*9.026*	*7.424*	*7.298*
ClosePastTrade	0.019		0.002		-0.003	
	2.485		*0.506*		*-1.370*	
ClosePastTrade2		0.040		0.008		0.004
		3.964		*1.620*		*1.422*
Log Mkt Cap	-0.023	-0.024	-0.015	-0.015	-0.014	-0.013
	-9.289	*-9.686*	*-12.784*	*-12.925*	*-19.368*	*-19.303*
Trade/MktCap	-27.308	-28.989	-1.613	-1.768	-3.844	-3.545
	-2.301	*-2.447*	*-0.291*	*-0.319*	*-1.188*	*-1.096*
LogTNA	0.009	0.010	0.002	0.002	-0.003	-0.003
	4.204	*4.577*	*2.240*	*2.344*	*-4.915*	*-5.011*
LogTNASponsor	0.009	0.009	0.005	0.005	0.002	0.002
	3.474	*3.517*	*3.990*	*3.998*	*3.125*	*3.090*
FlowPos	0.006	0.005	-0.012	-0.012	-0.019	-0.019
	0.745	*0.611*	*-2.917*	*-2.956*	*-8.370*	*-8.329*
XSReturn Lagged 1Month	0.013	0.014	0.183	0.183	0.121	0.121
	0.274	*0.305*	*6.549*	*6.558*	*8.925*	*8.901*
Intercept	0.297	0.311	0.253	0.254	0.295	0.292
	4.602	*4.841*	*8.050*	*8.127*	*16.701*	*16.613*
Obs	94016	94016	93916	93916	93672	93672
R-squared	0.0026	0.0027	0.0056	0.0056	0.0101	0.0101

Table IV (Cont.) Information in Trades Regression

This table estimates future excess daily returns of buy and sell trades for 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction from January 2001 and June 2004. The excess returns for one week ahead are the average compounded daily excess returns (in percent) five trading days after the day of the trade. The log of daily excess returns are summed up across the five trading days and then divided by five. Each daily return is measured in logs and in excess of its respective market where the TSX300 index return is the market used for Canada and the S&P500 is used for the U.S. Similar average daily excess returns are calculated for 1 month (21 trading days) and 3 months (63 trading days) after the trade. *CanUS* is an indicator taking the value 1 if the stock is traded in Canada and 0 if the stock is traded in the U.S. In the case of cross-traded securities, we assume the default market is Canada. *Active* takes the value 1 if a fund was actively managed and 0 if a fund was an index fund. *ClosePastTrade* takes the value 1 if a trade occurred within 7 days of another trade in the same stock at the same fund and 0 otherwise. *ClosePastTrade2* takes the value 1 if a trade occurred within 7 days of another trade in the same stock at the same fund and there are no trades in the same stock for the same fund for 7 days after the trade. *LogMktCap* is the log of a firm's market capitalization which is the closing price multiplied by the number of shares each day. *Trade/MktCap* is the dollar value of the trade divided by the market capitalization of the firm. *LogTNA* is the log of the total net assets of the fund (aggregated across shareclasses) and *LogTNASponsor* is the log of the total net assets of the sponsor of the fund. Total net assets for both the sponsor and fund are reported for the month of the trade. *Spread* is the difference between the closing ask and bid price for the stock divided by the midpoint. *FlowPos* takes the value 1 if the flow into the fund in the month of the trade is positive and 0 otherwise. Fund flow is the difference of total net asset, TNA, at the end of the month coinciding with the trade less the previous month's TNA adjusted for returns, $TNA_{t-1}(1+R_t)$ and divided by last month's TNA. *XSReturn Lagged 1 Month* is the lagged compounded excess return (in percent) for the stock in the 21 trading preceding the trade (excluding the return on the trade day). T-statistics are reported in italics below each coefficient and are use Huber/White adjusted standard errors adjust for heteroskedasticity. Panel A reports future returns for buy trades and Panel B reports future returns for sell trades.

Panel B: Future Returns of Sell Trades

	Average Daily Excess Returns Looking Forward					
	1 week		1 month		3 month	
CanUS	-0.045	-0.045	-0.029	-0.029	-0.028	-0.028
	-3.728	*-3.781*	*-5.162*	*-5.188*	*-8.691*	*-8.672*
Active	-0.071	-0.086	-0.037	-0.041	0.004	0.005
	-4.107	*-4.993*	*-4.883*	*-5.355*	*0.893*	*1.147*
ClosePastTrade	-0.046		-0.008		0.004	
	-4.763		*-1.670*		*1.354*	
ClosePastTrade2		-0.015		0.011		0.003
		-1.158		*1.716*		*0.693*
Log Mkt Cap	0.007	0.009	-0.006	-0.005	-0.012	-0.013
	1.882	*2.407*	*-3.219*	*-3.103*	*-12.558*	*-12.851*
Trade/MktCap	68.098	72.534	31.368	32.070	8.073	7.723
	3.857	*4.105*	*4.048*	*4.140*	*2.018*	*1.936*
LogTNA	-0.008	-0.010	-0.009	-0.009	-0.001	-0.001
	-2.642	*-3.156*	*-6.024*	*-6.241*	*-1.783*	*-1.650*
LogTNASponsor	-0.007	-0.008	-0.003	-0.003	0.000	0.000
	-2.012	*-2.096*	*-1.869*	*-1.854*	*-0.156*	*-0.124*
FlowPos	0.006	0.002	-0.018	-0.019	-0.026	-0.026
	0.563	*0.194*	*-3.674*	*-3.847*	*-9.204*	*-9.131*
XSReturn Lagged 1Month	-0.095	-0.087	0.045	0.045	0.039	0.038
	-1.345	*-1.239*	*1.232*	*1.247*	*2.279*	*2.242*
Intercept	0.004	-0.037	0.243	0.236	0.307	0.310
	0.037	*-0.379*	*5.405*	*5.277*	*12.137*	*12.340*
Obs	62705	62705	62646	62646	62414	62414
R-squared	0.0018	0.0015	0.0028	0.0028	0.0070	0.0070

Table V. Trading Costs and Information for Buy Trades

This table estimates future excess daily returns of buy trades for 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction from January 2001 and June 2004. The excess returns for one week and one month ahead are reported as an average daily percent and calculated as in Table III. *ExpTradingCost* is the predicted value from the regression in Table II. *ExpTradingCost*INFO* is an interaction term between expected trading cost and the various measures of information in trades. *CanUS* is an indicator taking the value 1 if the stock is traded in Canada and 0 if the stock is traded in the U.S. In the case of cross-traded securities, we assume the default market is Canada. *Active* takes the value 1 if a fund was actively managed and 0 if a fund was an index fund. *ClosePast* takes the value 1 if a trade occurred within 7 days of another trade in the same stock at the same fund and 0 otherwise. *ClosePast2* takes the value 1 if a trade occurred within 7 days of another trade in the same stock at the same fund and there are no trades in the same stock for the same fund for 7 days after the trade. *LogMktCap* is the log of a firm's market capitalization which is the closing price multiplied by the number of shares each day. *Trade/MktCap* is the dollar value of the trade divided by the market capitalization of the firm reported in percent. *LogTNA* is the log of the total net assets of the fund (aggregated across shareclasses) and *LogTNASponsor* is the log of the total net assets of the sponsor of the fund. Total net assets for both the sponsor and fund are reported for the month of the trade and in millions. *FlowPos* takes the value 1 if the flow into the fund in the month of the trade is positive and 0 otherwise. Fund flow is the difference of total net asset, TNA, at the end of the month coinciding with the trade less the previous month's TNA adjusted for returns, $TNA_{t-1}(1+R_t)$ and divided by last month's TNA. *XSReturn Lagged 1 Month* is the lagged compounded excess return for the stock in the 21 trading preceding the trade (excluding the return on the trade day) and reported in percent. T-statistics are reported in italics below each coefficient and are use Huber/White adjusted standard errors adjust for heteroskedasticity.

	Average Daily Excess Returns 1 Week Forward						**Average Daily Excess Returns 1 Month Forward**					
		INFO Interaction terms						**INFO Interaction terms**				
		Active	**ClosePast**	**ClosePast2**	**TNA**	**FlowPos**		**Active**	**ClosePast**	**ClosePast2**	**TNA**	**FlowPos**
ExpTradingCost	0.795	-0.322	0.761	0.779	0.781	0.830	0.200	-0.303	0.156	0.195	0.174	0.193
	4.582	*-1.161*	*4.314*	*4.481*	*4.391*	*4.722*	*1.925*	*-2.021*	*1.461*	*1.865*	*1.653*	*1.792*
ExpTradingCost * INFO		1.224	0.072	0.116	0.000	-0.068		0.551	0.093	0.042	0.000	0.015
		4.922	*0.688*	*1.300*	*0.739*	*-0.701*		*4.204*	*1.740*	*0.961*	*1.998*	*0.290*
CanUS	0.018	0.019	0.018	0.018	0.018	0.018	-0.011	-0.011	-0.011	-0.011	-0.012	-0.011
	1.615	*1.662*	*1.620*	*1.581*	*1.593*	*1.594*	*-1.882*	*-1.829*	*-1.866*	*-1.904*	*-1.933*	*-1.876*
Active	0.249	-0.051	0.247	0.250	0.249	0.249	0.095	-0.040	0.093	0.096	0.095	0.095
	8.381	*-0.829*	*8.338*	*8.414*	*8.387*	*8.371*	*5.514*	*-1.240*	*5.370*	*5.545*	*5.453*	*5.520*
ClosePast	0.052	0.050	0.042	0.046	0.051	0.052	0.010	0.009	-0.002	0.008	0.009	0.010
	4.978	*4.768*	*2.641*	*4.206*	*4.895*	*4.957*	*1.793*	*1.627*	*-0.276*	*1.374*	*1.636*	*1.799*
LogTNA	0.021	0.023	0.021	0.022	0.021	0.022	0.005	0.006	0.005	0.006	0.004	0.005
	6.247	*6.544*	*6.248*	*6.299*	*5.543*	*6.327*	*2.845*	*3.087*	*2.875*	*2.889*	*1.980*	*2.816*
LogTNASponsor	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	1.746	*1.521*	*1.731*	*1.740*	*1.775*	*1.736*	*3.033*	*2.822*	*2.998*	*3.030*	*3.160*	*3.039*
XSRetlag1mo	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.002	0.002	0.002
	0.195	*0.174*	*0.185*	*0.203*	*0.197*	*0.197*	*6.534*	*6.521*	*6.510*	*6.539*	*6.541*	*6.532*
LogMktCap	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011
	-1.052	*-0.997*	*-1.036*	*-1.086*	*-1.084*	*-1.074*	*-3.993*	*-3.915*	*-3.960*	*-4.015*	*-4.097*	*-3.986*
FlowPos	0.009	0.008	0.009	0.009	0.010	0.019	-0.011	-0.011	-0.011	-0.011	-0.010	-0.013
	1.161	*0.986*	*1.150*	*1.137*	*1.204*	*1.297*	*-2.674*	*-2.832*	*-2.701*	*-2.691*	*-2.513*	*-1.640*
Trade/MktCap	-1.114	-1.232	-1.104	-1.117	-1.120	-1.117	-0.228	-0.281	-0.215	-0.229	-0.238	-0.228
	-5.063	*-5.506*	*-5.030*	*-5.071*	*-5.096*	*-5.079*	*-1.840*	*-2.211*	*-1.736*	*-1.849*	*-1.890*	*-1.835*
Intercept	-0.371	-0.087	-0.365	-0.366	-0.362	-0.373	0.084	0.212	0.092	0.086	0.099	0.085
	-2.266	*-0.514*	*-2.234*	*-2.239*	*-2.192*	*-2.283*	*0.887*	*2.210*	*0.965*	*0.903*	*1.039*	*0.892*
Obs	94016	94016	94016	94016	94016	94016	93916	93916	93916	93916	93916	93916
R-squared	0.0030	0.0033	0.0030	0.0030	0.0030	0.0030	0.0057	0.0059	0.0057	0.0057	0.0057	0.0057

Table VI. Trading Costs and Information for Sell Trades

This table estimates future excess daily returns of sell trades for 210 mutual funds in Canada based on their interim and annual statements of portfolio transaction from January 2001 and June 2004. The excess returns for one week and one month ahead are reported as an average daily percent and calculated as in Table III. *ExpTradingCost* is the predicted value from the regression in Table II. *ExpTradingCost*INFO* is an interaction term between expected trading cost and the various measures of information in trades. *CanUS* is an indicator taking the value 1 if the stock is traded in Canada and 0 if the stock is traded in the U.S. In the case of cross-traded securities, we assume the default market is Canada. *Active* takes the value 1 if a fund was actively managed and 0 if a fund was an index fund. *ClosePast* takes the value 1 if a trade occurred within 7 days of another trade in the same stock at the same fund and 0 otherwise. *ClosePast2* takes the value 1 if a trade occurred within 7 days of another trade in the same stock at the same fund and there are no trades in the same stock for the same fund for 7 days after the trade. *LogMktCap* is the log of a firm's market capitalization which is the closing price multiplied by the number of shares each day. *Trade/MktCap* is the dollar value of the trade divided by the market capitalization of the firm reported in percent. *LogTNA* is the log of the total net assets of the fund (aggregated across shareclasses) and *LogTNASponsor* is the log of the total net assets of the sponsor of the fund. Total net assets for both the sponsor and fund are reported for the month of the trade and in millions. *FlowPos* takes the value 1 if the flow into the fund in the month of the trade is positive and 0 otherwise. Fund flow is the difference of total net asset, TNA, at the end of the month coinciding with the trade less the previous month's TNA adjusted for returns, $TNA_{t-1}(1+R_t)$ and divided by last month's TNA. *XSReturn Lagged 1 Month* is the lagged compounded excess return for the stock in the 21 trading preceding the trade (excluding the return on the trade day) and reported in percent. T-statistics are reported in italics below each coefficient and are use Huber/White adjusted standard errors adjust for heteroskedasticity.

	Average Daily Excess Returns 1 Week Forward						**Average Daily Excess Returns 1 Month Forward**					
		INFO Interaction terms						**INFO Interaction terms**				
		Active	**ClosePast**	**ClosePast2**	**TNA**	**FlowPos**		**Active**	**ClosePast**	**ClosePast2**	**TNA**	**FlowPos**
ExpTradingCost	0.421	0.780	0.408	0.415	0.405	0.332	0.392	0.762	0.334	0.392	0.471	0.414
	1.795	*1.670*	*1.531*	*1.750*	*1.721*	*1.342*	*3.219*	*3.772*	*2.532*	*3.179*	*3.811*	*3.246*
ExpTradingCost * INFO		-0.397	0.025	0.035	0.000	0.226		-0.408	0.108	0.005	0.000	-0.054
		-1.004	*0.119*	*0.236*	*0.680*	*1.114*		*-2.374*	*1.075*	*0.071*	*-7.306*	*-0.555*
CanUS	-0.030	-0.029	-0.030	-0.030	-0.029	-0.031	-0.015	-0.015	-0.015	-0.015	-0.017	-0.015
	-1.986	*-1.976*	*-1.986*	*-1.988*	*-1.963*	*-2.059*	*-2.022*	*-2.004*	*-2.028*	*-2.021*	*-2.237*	*-1.975*
Active	-0.056	0.000	-0.057	-0.056	-0.056	-0.059	-0.024	0.034	-0.025	-0.024	-0.027	-0.023
	-3.054	*-0.002*	*-3.057*	*-3.053*	*-3.020*	*-3.168*	*-2.794*	*1.433*	*-2.937*	*-2.794*	*-3.170*	*-2.713*
ClosePast	-0.025	-0.024	-0.027	-0.026	-0.024	-0.025	0.012	0.012	-0.001	0.012	0.012	0.012
	-1.622	*-1.607*	*-0.966*	*-1.580*	*-1.616*	*-1.630*	*1.617*	*1.648*	*-0.045*	*1.486*	*1.547*	*1.624*
LogTNA	0.000	0.000	0.000	0.000	-0.002	0.000	-0.001	-0.001	-0.001	-0.001	0.007	-0.001
	0.007	*-0.028*	*0.009*	*0.010*	*-0.258*	*-0.073*	*-0.402*	*-0.474*	*-0.378*	*-0.401*	*2.226*	*-0.361*
LogTNASponsor	-0.010	-0.010	-0.010	-0.010	-0.009	-0.010	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005
	-2.465	*-2.468*	*-2.469*	*-2.462*	*-2.434*	*-2.524*	*-3.014*	*-3.021*	*-3.046*	*-3.012*	*-3.323*	*-2.972*
XSRetlag1mo	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	0.000	0.000	0.000	0.000	0.000
	-1.280	*-1.269*	*-1.279*	*-1.283*	*-1.266*	*-1.286*	*1.326*	*1.351*	*1.330*	*1.324*	*1.205*	*1.329*
LogMktCap	0.011	0.011	0.011	0.011	0.011	0.011	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	2.599	*2.619*	*2.608*	*2.575*	*2.611*	*2.554*	*-0.993*	*-0.961*	*-0.959*	*-0.993*	*-1.107*	*-0.973*
FlowPos	0.023	0.023	0.023	0.024	0.024	-0.001	-0.002	-0.002	-0.002	-0.002	-0.006	0.004
	1.643	*1.618*	*1.644*	*1.646*	*1.686*	*-0.047*	*-0.269*	*-0.344*	*-0.261*	*-0.269*	*-0.781*	*0.318*
Trade/MktCap	0.417	0.439	0.419	0.417	0.404	0.420	0.067	0.090	0.076	0.067	0.132	0.067
	1.863	*1.990*	*1.888*	*1.861*	*1.767*	*1.880*	*0.624*	*0.838*	*0.712*	*0.623*	*1.211*	*0.617*
Intercept	-0.188	-0.241	-0.186	-0.186	-0.184	-0.166	0.064	0.010	0.072	0.065	0.041	0.059
	-1.335	*-1.600*	*-1.305*	*-1.314*	*-1.302*	*-1.153*	*0.906*	*0.139*	*1.019*	*0.906*	*0.578*	*0.821*
Obs	62705	62705	62705	62705	62705	62705	62646	62646	62646	62646	62646	62646
R-squared	0.0019	0.0020	0.0019	0.0019	0.0019	0.0020	0.0032	0.0033	0.0032	0.0032	0.0040	0.0032