Centralized Research in Investment Management Companies

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Abstract

I study the value of centralized research, i.e., information produced at the level of a fund management company. I identify trades that likely use centralized research using a proxy based on common trades of same-family managers. Such trades account for about 30% of fund volume and outperform benchmarks and remaining trades by as much as 47 basis points per month. Their performance is not explained by herding, short-term liquidity pressures, changes in the index composition, or funds' reaction to analyst revisions, and does not revert in the long term. In contrast, non-centralized trades fail to beat benchmarks even before expenses, e.g., their average characteristic-adjusted return is a statistically insignificant 0.03% per month. Overall, centralized research increases after-fee fund returns by about 0.30% per quarter. These results indicate that research support from a management company may be more important for performance than the quality of a fund's manager.

JEL classification: G11, G14, G23.

Success of an investment fund is usually associated with that fund's manager. Managers command high salaries, are constantly in the spotlight, and their views on the markets are sought by the media and presumably followed by other investors. Even academic research often uses a mental shortcut of equating a fund with its manager. The manager's skill is, however, only one of determinants of overall fund returns. Anecdotal evidence obtained from fund managers, or even a cursory glance at fund websites suggest another important driver of performance: centralized research, or analysis and support offered at the level of a fund management company. While the most obvious example of centralized resources are buy-side analysts, centralized research is a broader concept and also includes specialized information systems (e.g., databases) to which all managers have access, informal communication networks of same-company managers, etc. The present study analyzes such research in mutual fund management companies and compares its value to the value added by individual fund managers.

Since centralized resources, such as buy-side analyst forecasts, are not observable, I propose a proxy that indicates whether a given trade is based on centralized research. To identify such trades I study management companies that sponsor multiple funds. Centralized research, by definition, is available to all managers employed by such companies. If it includes a valuable news item, multiple funds are likely to act on it and buy or sell similar stocks. Thus, when multiple funds that belong to the same company trade the same stock in the same direction, this trade is classified as based on centralized research (in short, "centralized"). This proxy is fundamentally different from simply counting possibly unrelated funds that trade a stock in that managers from the same company have access to similar information. In contrast, managers from unrelated companies have different information sets. Even if they receive the same news, it may or may not be generated by centralized research in any of their companies.[1]

In the quarter subsequent to when centralized trades are identified, they beat benchmarks

[1]As described below, there are large differences in the performance of trades repeated by multiple same-company funds and trades repeated by multiple unrelated funds.

by as much as 0.33% per month. This effect is apparent already in trades at least two same-company funds make. However, the results are stronger when three-or-more-fund trades are considered, and the strongest when at least four funds trade the same stock.[2] The performance of centralized trades is not driven by the fact that multiple funds trade the same stock in the same quarter. In fact, trades made by multiple managers from unrelated companies, if anything, underperform the benchmarks. Consequently, the difference in performance of centralized trades and non-centralized trades repeated by multiple unrelated funds reaches 0.47% per month.

Centralized trades account for only about 30% of a typical management company's dollar volume. The remaining (non-centralized) trades do not outperform passive benchmarks even before transaction costs. For example, the 95% confidence interval for the characteristic-adjusted returns on such trades is from about -4 to 8 basis points per month.[3] Even the highest values from this interval are likely too small to cover transaction costs and other fund expenses. Since such additional trades account for most of fund volume, this helps explain why overall after-fee returns of mutual funds are, on average, negative.

The above facts lead to a natural question: How can we reconcile the skill apparent in centralized trades with the fact that overall fund returns do not outperform the benchmarks? First, and most importantly for fund investors, funds involved in centralized trades do well not only on paper (in the sense that a subset of their trades do well), but also beat the remaining funds. Funds participating in centralized trades outperform other funds by about 0.30% in the quarter following a centralized trade.

Second, one would expect that only a subset of all fund trades is designed to outperform. Other trades serve other purposes, for example, managing the flow of new money into a fund,

[2]Unfortunately, there are few stocks traded by five or more same-company funds in the same quarter.

[3]Chen, Jegadeesh, and Wermers (2000) use holdings data to show that mutual fund purchases outperform sales. I show that the abnormal performance is limited to the centralized trades, which outperform both benchmarks and other fund trades by statistically and economically significant margins.

rebalancing a fund's portfolio, or perhaps marketing a fund to a clientele. If such trades are not correlated across same-company funds, they will be classified as non-centralized trades. The remaining non-centralized trades likely reflect idiosyncratic ideas of individual fund managers. The fact the non-centralized trades as the whole do about as well as the benchmarks indicates that idiosyncratic manager ideas fail to outperform even before expenses.[4]

Finally, it may be argued that the skill of individual managers is apparent also in the centralized trades. The proxy used in this paper identifies ideas generated by centralized research only if multiple managers decide to act upon them. The proxy cannot identify information no manager acts on and actually misclassifies centralized research used by only one manager. Thus, the outstanding performance of centralized trades is a testimony not only to the potential value of centralized research, but also to the skill of managers who correctly identify most valuable items in it.

This suggests that a good manager should concentrate on centralized research and do not try to generate his or her own ideas. To the extent that managers deviate from this prescription, they seem to hurt their investors. As I discuss below, there is substantial variation in how much funds from different families use centralized research, and this variation leads to differences in overall fund returns.

I carry out additional tests to ensure that my results are robust. The abnormal performance of centralized trades is evident in both covariance- and characteristics-based measures. My findings are better explained by impounding new information into stock prices than by temporary price pressure. First, the effect is not due to trades funds repeat in subsequent quarters. Second, performance does not revert in the long run; if anything, it persists for two quarters after funds trade. Although the measure I propose is based on correlated trades, the results are not driven by fund herding (e.g., Wermers, 1999) or changes in the breadth of stock

[4]If rebalancing trades underperform, e.g., because of price impact, then idiosyncratic manager trades may generate an alpha that is just enough to offset such underperformance.

ownership (Chen, Hong, and Stein, 2002). The effect is substantially stronger in stocks that do not belong to the S&P500 index, perhaps because trades in index stocks are often made to align funds with the index and relatively fewer of them are directly driven by centralized research.[5] Lastly, centralized trades and their performance are not driven by funds' reaction to analyst revisions.

Due to data limitations, centralized research has received relatively little direct attention in the literature. Cheng, Liu, and Qian (2006) use survey evidence to show that money managers who rely more on in-house research perform better than other managers. In contrast, Groysberg, Healy, Chapman, Shanthikumar, and Gui (2007) compare buy-side and sell-side analysts and conclude that buy-side EPS forecasts are relatively less accurate and that buy-side strategies have inferior performance. While the focus of Chen, Hong, Huang, and Kubik (2004) is fund size, the results in that paper indicate that fund family size positively correlates with performance of that family's funds. Since larger families can afford better analysts, support systems, etc., family size may proxy for the quality of centralized research. Finally, there is a growing body of literature that shows that particular subsets of mutual fund trades outperform. Alexander, Cici, and Gibson (2007) find that trades made against fund flows (e.g., buys that coincide with heavy outflows; presumably, trades managers are more bullish about) beat the benchmarks, while Baks, Busse, and Green (2007) and Cremers and Petajisto (2007) document that managers who make more aggressive active bets (deviate from the benchmarks the most) do better than other managers. Finally, Cohen, Polk, and Silli (2008) focus on mutual funds' most aggressive positions and show that stocks funds overweight outperform.

This paper proceeds as follows. In the next section, I overview the data used in this study. Section 2 discusses the performance of centralized trades and contains the main results of the paper. Section 3 investigates after-fee returns of funds that participate in centralized trades.

[5]This does not mean that the effect is driven by micro-cap stocks. Centralized trades are made in stocks that are large and liquid enough to be traded by multiple mutual funds at the same time.

Section 4 concludes. The Appendix contains additional robustness checks.

1 Data and descriptive statistics

To identify management companies and the funds they control, I use the management company identifier reported in the Thomson Financial mutual fund holdings database. I infer trades funds make in a given quarter by comparing holding reports from two adjacent quarters. While this restriction eliminates funds that file semiannually, it allows me to focus on funds with less stale reports.[6] Trades computed from holdings include stocks that were introduced into or deleted from a fund portfolio since the last report, and are adjusted for stock splits.

Fund-level data comes from the CRSP Mutual Fund database. Stock-level data, such as returns, market capitalization, or book-to-market ratios are taken from the CRSP and Compustat datasets. Stock returns are adjusted for delistings by using delisting returns whenever they are available from CRSP. If delisting returns are not available, I follow Shumway (1997) and assume the terminal return of -30% for stocks that disappear for performance-related reasons. Analyst forecasts (used to test if centralized research may coincide with sell-side research) are taken from I/B/E/S. The time series of Fama-French and momentum factors are obtained from Ken French's website[7] and the characteristics-based benchmarks, developed in Daniel, Grinblatt, Titman, and Wermers (1997) and Wermers (2004), are from Russ Wermers's website.[8]

Altogether, the sample includes 104 quarters between the first quarter of 1980 and the last quarter of 2005.

I only consider funds that can be mapped to the CRSP Mutual Fund database. To merge

[6]Results are similar when all funds that report quarterly or semiannually are used. The economic magnitude of abnormal performance is somewhat lower when funds with semi-annual reports are included, but the main results and their statistical significance remain unchanged.

[7]http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[8]The DGTW benchmarks are available via
http://www.smith.umd.edu/faculty/rwermers/ftpsite/Dgtw/coverpage.htm.

this database with fund holdings I use Mutual Fund Links available from WRDS. This link is available primarily for domestic equity funds; bond, money market, specialty, etc., funds are removed from the sample. This restriction allows me to focus on funds that specialize in equities. Since the goal of this paper is to study multiple portfolios of a given management company, I discard all management companies that control only one fund. Finally, I remove index funds. Index funds are identified by searching fund names for keywords such as "index," "market," "S&P," etc., and manually screening names that include such keywords. This restriction is important as companies that sponsor index funds may mechanically trade the same stock in multiple portfolios.

Table I reports the most important characteristics of the data. The summary statistics are time-series averages of cross-sectional estimates. For example, the median number of stocks per fund is obtained by taking the average over the time series of cross-sectional medians.

The sample includes, on average, 169 management companies per quarter. Even at the beginning of the sample period there are more than 50 companies, so the tests presented here are unlikely to be influenced by any single one. The average company sponsors 4.5 domestic equity funds. There are many companies that control only two equity funds (about 40% in the average quarter; more at the beginning of the sample); at the other end of the spectrum, a few large companies manage more than 10 funds (about 8% in the average quarter).

Table I includes only a fraction of the management companies in existence. To enter the sample, a management company needs to have at least two domestic equity funds. Consequently, the sample includes about 46% of all funds with data in the Thomson Financial database; the remaining 54% either belong to companies with only one equity fund (although it may have other funds, say, a money market fund) or do not have a valid management company identifier. In terms of the total net assets, the sample accounts for about 64% of total assets reflected in the Thomson Financial database. Funds included in the sample tend to be larger (their average

Total Net Assets (TNA) is about $698M, while funds that are not included average $353M), have higher average returns (3.38% compared to 3.13% per quarter), have lower expense ratios (1.2% versus 1.29%), and are less volatile. Other characteristics (e.g., turnover, front and rear loads) are similar for included and excluded funds.

For a trade to qualify as centralized, it needs to made by at least two funds managed by the same company (and all these funds need to trade the same stock in the same quarter). Table II investigates how frequently such trades occur and what volume they represent in a typical company. To construct this table, trades in at least two same-company funds are divided into three subsets: buys, sells, and all trades. The last subset includes opposite transactions that simply move stocks within the management company (one fund sells a stock, another fund buys it). The top half of Table II focuses on the number of stocks traded in multiple portfolios in a given quarter, while the bottom half employs the dollar volume generated in multiple funds. Both measures are expressed as raw numbers and as fractions relative to the number of stocks traded and total volume generated (including both multiple- and single-fund trades).

The main result in Table II is that a sizable portion of the volume that management companies generate is due to trades in multiple funds.[9] 16% of stocks purchased by the average company is bought into more than one portfolio, while the corresponding number for sales is only slightly lower. In the average company, purchases and sales in multiple funds account for 29% and 25% of total buy and total sell volume, respectively. Interestingly, there seems to be a lot of heterogeneity in how different companies operate. About 25% of companies do not trade in multiple portfolios at all.[10] In a given sample quarter they buy, on average, only 1 stock and sell, on average, 0.36 stocks in more than one fund. While the purchase size accounts for about 3% of the overall dollar volume of these companies, multi-fund sales correspond to a

[9]Below, I compare the size and other characteristics of stocks traded in one and in multiple portfolios.

[10]While Table II offers only a static snapshot of the data, in unreported tests I find that reliance on multi-fund trades is highly persistent. Controlling for size, the number of funds, and the number of styles, AR(1) coefficients of the fraction of the number of or the volume generated in centralized trades are about 0.6-0.7.

negligible 0.4% of total dollar volume. At the other end of the spectrum there are funds that trade more than 20% of stocks and generate about 50% of total volume in transactions that involve multiple funds.

In unreported analysis I find that stocks centralized trades are among the largest in the market, even accounting for the fact that mutual funds in general have a preference for large companies. For example, the median stock traded in a single fund belongs in the ninth (second largest) size decile, while the median stock traded in multiple funds is in the tenth decile (largest stocks). In terms of the other characteristics stocks traded in single and in multiple funds are very similar. For example, the median stock bought in a single fund (in multiple funds) is at 40th (39th) percentile of the book-to-market ratio and 62nd (62nd) percentile of stocks sorted on past year performance.

The preference for large stocks may be driven by two effects. First, centralized research may be purposely focused on larger companies that are more complex and require more information to analyze. Moreover, liquidity is positively correlated with size. If mutual funds have new information about a stock, the information is more valuable if that stock is liquid and if multiple funds can trade it cheaply. Second, and perhaps more importantly, the probability of trading a given stock by any mutual fund is increasing in the size of the stock (e.g., Falkenstein, 1996). Thus, large cap stocks are more likely to be traded by multiple funds even if portfolio choices of individual managers are independent. Moreover, while index funds are discarded from the sample, some of the trades classified as centralized may still be trades of closet indexers, and such trades are probably made in large-cap stocks. The proxy used in this paper may spuriously identify such trades as driven by centralized research. This drawback probably makes it more difficult to find any abnormal performance in multi-fund trades; as I show in the next section, the evidence that such trades outperform is strong in spite of that. Moreover, the results are stronger when trades in S&P500 stocks are excluded.

2 The value of centralized research

This section investigates whether management companies do better in trades they make in multiple funds. As outlined in the introduction, such trades are likely driven by centralized research. The first issue this section deals with is whether centralized trades beat the benchmarks. Second, I investigate whether they outperform idiosyncratic trades of individual managers. Finally, I study longer term returns on multiple-fund trades and alternative explanations for their abnormal performance.

2.1 Performance of centralized and non-centralized trades

The test portfolios employed in this section are constructed in the following manner. In each sample quarter, for each management company, I use two adjacent holding reports to identify stocks that were bought or sold by a given number of funds (say, at least two funds). If at least five such stocks are identified, a portfolio long in buys and short in sells is formed on the first day of the next quarter.[11] These portfolios are then held for three months and are rebalanced based on the next holding report.

Table III summarizes the performance of single- and multiple-fund trades. Columns of the table indicate how many same-company funds traded a given stock. The first column focuses on stocks traded in exactly one fund of a management company (including stocks traded in a single fund in more than one company). Given the identification strategy used in this paper, these trades either are based on information that is idiosyncratic to a particular manager or are designed for non-performance goals, e.g., rebalancing. The next three columns correspond to the centralized trades, identified by observing that at least two, three, or four same-company funds buy or sell a given stock.

[11] Below I discuss the results obtained separately for buys and for sells, as well as the impact of a delay between the end of the quarter in which funds trade and portfolio formation date.

Table III presents results for equal, value, and count-based portfolio weights. Count weights are proportional to the number of management companies that trade a stock in multiple funds. For example, in the at-least-three-funds purchase portfolio, the count-based weight is equal to the number of companies that bought a given stock in more than two of their funds, standardized so that the weights sum to 1. Count-based weights are larger for stocks that were multi-fund purchases or sales in many management companies. If multiple companies consider a piece of information valuable, it is more likely that the new information represents a truly attractive trading opportunity.

Table III, as well as the remaining tables, reports performance measured by average monthly returns and by alphas estimated with respect to the usual pricing models: CAPM, Fama and French (1993) three-factor model, and Carhart's (1997) four-factor model that adds momentum to the Fama and French factors. I also compute abnormal performance by adjusting for characteristics. For this last measure, stocks are matched on size, book-to-market, and past performance, as described in Daniel, Grinblatt, Titman, and Wermers (1997) and Wermers (2004). To ensure that the results are robust, I also experimented with adjustments for size and momentum only (since some stocks do not have book-to-market data), changing the momentum definition (e.g., considering past 6 or 12 month returns, skipping last month's returns or not), or using equally- and value-weighted adjustment portfolios. In all cases, the results are similar to those exhibited in Table III and do not change the conclusions.[12] The t-statistics, reported in parentheses, are computed using the Newey-West weighting matrix.

The main results of Table III can be summarized as follows. First, there is no evidence that single-fund trades outperform. Once momentum is accounted for, both four-factor alphas and characteristics-adjusted returns are insignificant at the 5% level. Moreover, the average

[12]Additionally, I consider conditional models based on Ferson and Schadt (1996), and models augmented with the liquidity factor of Pastor and Stambaugh (2003), short-term reversal factor, and the idiosyncratic risk factor of Ang, Hodrick, Xing, and Zhang (2006). The results, reviewed in the Appendix, are at least as strong as those presented in Table III and the subsequent tables.

characteristics-adjusted returns are economically small even if their magnitude is taken at the face value, without accounting for standard errors. At best, single-fund purchases outperform single-fund sales by about 2.3 basis points a month, or about a quarter of a percentage point per year. Transaction costs are likely to be at least as high as this amount, which means that net returns will be negative.[13] Interestingly, point estimates of all performance measures suggest that the equal-weighted portfolio of single fund trades does better than the count-weighted portfolio. For example, the three-factor alpha of the former is estimated at 8 basis points per month (t-statistic of 2.26; the only performance metric for the single-fund portfolio that is significant at the 5% level), while the corresponding estimate for the count-weighted portfolio is negative 3 basis points. Count-weighted portfolio is tilted towards stocks many separate companies trade in exactly one of their funds. The estimates indicate that the more companies trade a stock in a single fund, the weaker the subsequent performance. I come back to this point when discussing Table IV below.

Second, the trades that management companies make in multiple funds significantly outperform. The last three columns of Table III present strong evidence that such trades beat the benchmarks, both these based on covariances and these based on characteristics. Four-factor alphas are as high as 19 basis points per month, or about 2.28% per year, for the value-weighted portfolio and up to 33 basis points per month, or about 4% per year, for the equal- and count-weighted portfolios. The value-weighted portfolio outperforms its characteristics-based benchmarks by up to about 10 basis points per month or 1.2% per year (however, these numbers are only marginally significant with t-statistics of 1.62-1.8), while the equal- and count-weighted portfolios beat their characteristics benchmarks by up to 22 basis points per month, or 2.6% per year.

Third, the results are increasingly strong as one goes from stocks traded in at least two

[13]Wermers (2000) estimates the difference between mutual fund gross and net returns (the sum of expenses and transaction costs) at 1.6% per year.

same-company funds, to stocks traded in at least three, to those traded in at least four. The abnormal performance is apparent already in trades made by at least two funds. For example, the four-factor alpha of the equally-weighted portfolio is significant at about 13 basis points a month (characteristics-matching indicates outperformance of about 8 basis points a month). These numbers dramatically increase to 24 and 33 (to 16 and 22) basis points per month when trades in at least three and at least four same-company funds are considered.[14]

Increasing the required number of funds that trade a given stock may increase the precision with which centralized research is identified. Some of such trades are coincidences that arise when two individual managers focus on the same stock by chance (e.g., because they both want to move closer to a benchmark). It is less likely that a similar coincidence occurs for three or four managers at the same time. Moreover, companies that trade a stock in three or more portfolios are, by construction, larger companies that control at least three funds. To the extent that company size proxies for the quality of centralized research, the increasing performance from two- to three- and four-fund portfolios may be partly driven by differences in research quality.

2.2 Interpreting the performance of centralized trades

The abnormal performance documented in Table III suggests that fund managers have skill, at least when they trade based on centralized research. However, there could be alternative explanations for this effect. Perhaps the most natural one is based on herding. Centralized

[14]Table III does not investigate the trades made in at least five same-company funds because there are few such trades in the sample. In 13% (17%) of sample quarters there are no families that buy (sell) any stock in at least five of their funds. Moreover, most stocks traded in five or more funds are S&P500 stocks, frequently after the index composition changes, which suggests that these trades may be designed to get closer to a benchmark and may not represent active bets. On average, 63% (66%) of five-fund buys (sells) are made in index stocks, while the corresponding numbers are below 50% for trades made in fewer than five funds. When Table III and the tables presented below are reproduced for five-fund trades, all performance results are insignificant. The strongest results are obtained when the equivalent of Table III is reproduced excluding trades in S&P500 stocks. The count-weighted portfolio of trades in at least five funds then generates a four-factor alpha (characteristic-adjusted return) of 36 basis points (29 bps) per month. However, their estimates are insignificant with the t-statistics of 1.47 and 1.02, possibly because the time series of returns is much shorter.

trades are identified by counting the trades same-company funds make. It is possible that the proxy is just picking up the trades that all mutual funds (not necessarily within the same management company) make. Such herding may have price implications if mutual funds' trades are informative to other market participants (e.g., Wermers, 1999) or perhaps because the breadth of ownership changes when many funds trade a stock (Chen, Hong, and Kubik, 2003).

To disentangle the impact of centralized trades from effects related to herding or changes in the breadth of ownership, I control for the overall number of funds trading a stock in Table IV. This table contrasts trades made by multiple same-company funds with trades made by the same number of unrelated funds and thus allows for a direct comparison of centralized and other trades (i.e., single-fund trades from different companies), while controlling for the overall number of funds trading. Table IV presents the difference of two spread portfolios: long in buys minus sells made in multiple same-company funds and short in buys minus sells made in multiple funds that belong to different management companies. In the first (second, third) column, I compare trades made by two or more (three or more, four or more) same-company funds to trades made by at least two (three, four) unrelated funds. However, while a trade repeated by, say, four funds at the same time is rather exceptional for a given management company, trades repeated by at least four unrelated funds are much more common. Thus, the fourth column in Table IV compares the performance of trades of four or more same-company funds to trades repeated by unrelated funds from at least 10% of management companies. This way, the number of stocks per portfolio is similar: In the average quarter, there are 287 stocks traded by at least four same-company funds and 235 stocks traded by at least 10% of unrelated funds.

Centralized trades outperform stocks traded by individual managers. This time, the magnitude of abnormal returns is even higher than in Table III, which suggests that the more unrelated funds trade a stock, the poorer this stock's subsequent performance. The results are

particularly strong for characteristic-adjusted returns. Even in the value-weighted portfolio, stocks traded in multiple funds outperform their single-fund counterparts by as much as 25 basis points per month. The most striking results are for the count-weighted portfolio, the performance of which is as high as 47 basis points per month (or up to about 5.6% per year).

The results discussed so far are related to, but distinct from those presented in Chen, Jegadeesh, and Wermers (2000). Chen et al. study trades of actively managed funds and conclude that stocks the mutual fund industry buys outperform those the industry sells. However, as reported in Table III, there is little evidence that trades of single funds deliver any abnormal performance. Even if point estimates of the spread portfolio alphas are taken at face value, without accounting for standard errors, they are about three times smaller than alphas estimated for stocks traded in multiple funds. Similarly, characteristics matching indicates no evidence that single-fund trades beat their benchmarks; the estimates are insignificant both statistically and economically. Thus, it is difficult to conclude unconditionally that active fund managers beat the benchmarks. They indeed outperform, but only in trades that multiple same-company funds make. When managers go beyond centralized research and trade on other information as well, there is no evidence that they are successful. As Table IV indicates, the performance of these additional trades is up to almost 0.5% per month lower than the performance of centralized trades.

Tables III and IV define centralized trades as trades made by at least two, three, and four funds. In the next two tables, the focus is on the portfolio of stocks at least three same-company funds trade. This portfolio, just as two- and four-fund ones, strongly outperforms. In terms of the economic magnitude of the estimates, it is in between the other two. This also holds for the results discussed below: They are stronger than those obtained for the two-fund portfolio, but weaker than those obtained for trades four or more same-company funds make.

Table V provides a series of robustness checks and presents several variations to the portfolio

strategy implemented in Tables III and IV. First, it decomposes the performance of the spread portfolio into its two legs, purchases and sales. Centralized purchases produce four-factor alphas between 12 and 20 basis points per month, depending on the weighting scheme (in all cases, at least marginally significant; the lowest t-statistic, 1.92, is for the value-weighted portfolio). Characteristics matching indicates abnormal returns of equally- and count-weighted portfolios of about 14 basis points per month; the value-weighted average is insignificant 3 basis points. Centralized sales seem to underperform the benchmarks. However, even though all estimates are negative, most of them are insignificant. The only statistically robust evidence is for the three-factor model: when sales are equal- or count-weighted, they underperform by more than 20 basis points per month. This effect is mainly due to momentum: four-factor alphas are insignificant negative 4-5 basis points. It is possible that multi-fund sales are made by management companies eliminating poorly performing stocks from their portfolios, which may reflect the tendency of mutual funds to prefer winners to losers, documented, e.g., in Grinblatt, Titman, and Wermers (1995).

Thus, fund managers are better at identifying good purchases than at selecting stocks to be sold. This may be because mutual funds have more flexibility in choosing which stocks to buy. They typically cannot sell short, so the only securities they can sell are those they already hold in their portfolios. In contrast, when they purchase, they have access to a much wider universe of stocks.

The next two columns of Table V refine the definition of centralized trades. Fund managers are often evaluated relative to indexes and may trade index stocks simply to align their funds with the benchmark. Such orchestrated behavior is particularly likely when the composition of the index changes. The third column in Table V investigates the performance of the buy minus sell portfolio after excluding stocks added to or deleted from the S&P500 index in the quarter in which fund trade or in the preceding quarter (as funds may spread their buying or selling

over a longer period of time). The performance results are very similar to those from Table III. Thus, abnormal returns of centralized research are not explained by the S&P500 inclusion effect documented in Harris and Gurel (1986) and Shleifer (1986). The fourth column of Table V imposes a harsher constraint and eliminates all stocks that were included in the index at any time during the quarter in which funds trade, as well as stocks excluded from the index in the preceding quarter. This time, there is a substantial effect on performance. For example, count-weighted portfolio's four-factor alphas (characteristics-adjusted returns) increase from 24 (16) basis points in Table III to 30 (27) basis points per month. The value-weighted portfolio also produces much higher abnormal returns than before (about 0.25% per month).

The increased magnitude of the effect could be due to two reasons. First, some of the trades in index stocks may be made to rebalance the fund portfolio closer to the benchmark rather than to actively bet on a stock. Such behavior is, in fact, more likely when managers have few good ideas, as in such a case they may prefer to tilt their portfolios closer to a benchmark. When trades in index stocks are discarded, the proxy for centralized research is improved and leads to more pronounced outperformance. The second interpretation is that it is easier to find attractive trading opportunities in non-index stocks that are perhaps not as scrutinized by analysts and other investors.

The fifth column of Table V presents the results when portfolios are formed without recent IPO stocks (stocks with IPOs in the quarter in which funds trade or in the preceding quarter). It is possible that some of the multi-fund trades occur when a management company allocates IPO stocks across its funds. However, when such trades are excluded the estimates are almost the same as in Table III. Thus, the abnormal performance is not driven by management companies getting access to attractive IPOs.

All evidence presented so far is based on trades inferred from funds' holding reports. A usual concern is that such reports could be window-dressed. For example, at the end of the quarter

funds may rebalance their portfolios towards stocks with good recent performance. If funds manipulate their holdings, they likely have the biggest incentive to do so in the last quarter of the year. The sixth column of Table V presents a partial check whether the results could be influenced by such behavior. The estimates in this column are obtained after excluding trades reported in the fourth quarter. Most of the estimates are slightly higher than those in Table III. However, the differences are small, so it is unlikely that window dressing has much influence on the proxy for centralized research.

Finally, it is possible that abnormal returns on multiple fund trades are caused by price pressure. Companies that trade a stock in multiple funds may consider the trade to be successful enough to repeat it in multiple quarters. In such a case, the performance of the trades made in the initial quarter may be artificially increased by liquidity pressure caused by subsequent trades. This situation may arise, for example, when funds scale up their portfolios to accommodate inflows (Lou, 2008). To test whether this affects the results discussed here, the last column of Table V reports the performance of one-time centralized trades, that is, trades in multiple funds that are not repeated in the subsequent quarter. The performance of the equal-weighted portfolio is decreased by about 5 basis points per month compared to the numbers from in Table III. However, both the estimates and the pattern of statistical significance of value- and count-weighted portfolio are almost the same as those reported previously. Thus, the performance of centralized research does not seem to be driven by sustained price pressure.

Another test of whether the outperformance is due to liquidity effects is to analyze performance over longer horizons. Figure 1 shows that the initial price changes do not revert in the long run. The graph presents three- (left column) and four-factor (right column) alphas of the spread portfolio of buys minus sells of three or more funds.[15] Figure 1 presents the performance of this portfolio in each of the six quarters following the quarter when funds trade. Thus, the

[15]When average characteristic-adjusted returns are graphed instead, the resulting pattern is very similar to that of four-factor alphas.

first point in the graphs, corresponding to the first quarter, is the same as the numbers presented in Tables III. The second point corresponds to a portfolio formed one quarter after fund trades are observed, etc.

Figure 1 illustrates that the abnormal returns of the first quarter do not revert within the next year and a half. There is no evidence of negative performance of multi-fund trades; if anything, performance persists for another quarter. Three-factor alphas for the equally- and count-weighted portfolios are significantly positive and economically large (of the order of 20 basis points a month) also in the second quarter after funds trade. When momentum is controlled for, four-factor alphas are still positive at about 10 basis points a month, but no longer significant. Starting in the third quarter, performance flattens out. Point estimates of alphas do become negative about 1-1.5 years after funds trade, but they are small (of the order of 3-5 basis points per month) and statistically insignificant.

The patterns shown in Figure 1 suggest that centralized research adds value. Managers who trade on such research correctly anticipate future price changes that do not revert in the long term. An interesting, but also challenging question is how managers are able to do that. Table VI investigates if they outperform by using publicly available information or whether their trades are motivated by information not yet discovered, or perhaps underestimated, by other market participants. To proxy for public information released in the given quarter I use revisions of EPS forecasts made by sell-side analysts. I use changes in consensus forecasts computed between the end of the quarter in which funds trade and the end of the previous quarter.[16] To make changes in revisions comparable between different stocks, I standardize them by the average of absolute values of consensus forecasts at the end of the two quarters. I use absolute values to ensure that the sign of the change is correct when the forecasts are negative.

[16]I use EPS revisions rather than investment recommendations as the latter are only available for the second half of my sample. Moreover, as Malmendier and Shanthikumar (2008) argue, EPS forecasts are usually directed to institutions, while recommendations are typically used by individual investors.

Centralized trades are then divided into two subsets: trades made "against analysts" and those made "with analysts." Funds trade with analysts when they buy a stock that had good news in a given quarter (measured as an EPS revision in the top 25% of all revisions) or sell a stock that had bad news (EPS revisions in the bottom 25%).[17] Trades against analysts are the complement of that set and include trades in stocks that did not experience a large revision or purchases (sales) of stocks with bad (good) revisions.

The benefits of the centralized research are only apparent in trades that are made against analysts. Trades in stocks that did not experience substantial revisions and trades made against such revisions exhibit abnormal performance, at least in equally- and count-weighted portfolios. Depending on the correction, these portfolios outperform by 15 to 25 basis points a month, or 1.8 to 3% per year. For the value weighted portfolio, the outperformance is significant in the four-factor alphas, but not in characteristic-adjusted returns.

In contrast, once momentum is controlled for, there is no evidence that trades made in the direction of analyst revisions outperform. There is no clear pattern in the signs of different performance measures; in any case, both four-factor alphas and characteristic-adjusted returns are insignificant. Interestingly, the average raw returns and three-factor alphas are substantially higher than those of the against analysts trades, which suggests that momentum plays a role in stocks that both experienced analyst revisions and were traded by multiple funds. Finally, average returns and alphas from Table VI do not sum up to those from Tables III and V. This is because Table VI only includes stocks that had valid analyst forecasts at the beginning and at the end of the quarter in which funds trade, whereas the previous tables did not impose this restriction. The abnormal performance is lower in Table VI than in previous tables, which suggests that centralized research is particularly valuable when it focuses on companies that do not have analyst coverage. This may be because information asymmetries and the potential advantage of skilled investors are higher in such stocks.

[17] I experimented with other cutoffs, for instance 30% or 50%, and the results are similar.

3 Centralized research and after-fee fund returns

The previous section established that trades based on centralized research outperform benchmarks. At the same time, non-centralized trades do not beat the benchmarks even before expenses. This is an important issue. On the one hand, companies produce research that seems to allow outperformance of the order of 4% per year over passive benchmarks. On the other hand, funds engage in more trades than centralized research warrants. These additional trades destroy value after transaction costs and fees are deducted. Given that these additional trades constitute as much as 70% of fund volume, it is possible that fund investors might not see the advantage of centralized research. The present section tests whether this is true by relating centralized trades to overall after-fee, net of expenses returns of mutual funds: First, by looking at performance of portfolios of mutual funds and, second, by regressing fund returns on a centralized research variable and fund- and management company-specific controls.

Table VII presents quarterly returns on portfolios of mutual funds, sorted by whether they participated in a centralized trade: a trade repeated by at least two (Panel A) or at least three (Panel B) mutual funds from the same management company. Fund returns, taken from the CRSP Mutual Fund database, are net of expenses. Additionally, to better approximate returns realized by fund investors, I account for front- and rear-end load fees whenever possible. Following Sirri and Tufano (1998), I amortize these fees over a seven year holding period. Unfortunately, for a number of fund/year observations, front- and rear-end loads are missing in the CRSP database. For these funds, I assume that the load fees are equal to zero.[18] Table VII compares the performance of (equal-weighted and TNA-weighted) portfolio of funds that participated in a centralized trade and the portfolio of funds that did not. Portfolios are formed on the first day of the quarter following the quarter in which centralized research is identified,

[18]The results are very similar when load fees are not subtracted from returns. For example, the average equally-weighted (TNA-weighted) return on the spread portfolio in the first row of Panel A of Table VII is 0.117% (0.134%) when loads are subtracted and 0.12% (0.14%) when they are not. The pattern in statistical significance is also similar.

so that the holding period corresponds to the holding period considered in Tables III through VI.

There is strong evidence that participating in buys based on centralized research improves fund returns. When centralized trades are defined as trades of at least two same-company funds, their benefit is about 13 basis points per quarter in after-fee fund returns. This difference is roughly the same when returns are corrected using the CAPM, Fama-French, and Carhart models. The effect is weaker for TNA-weighted portfolios, for example, the Carhart alpha of 11.6 basis points is insignificant with a t-statistic of 1.77. When the definition of centralized research is changed to trades at least three funds make (Panel B), the outperformance goes up to 20-30 basis points per quarter. This time it is, if anything, stronger for the TNA-weighted portfolio, the alphas of which are between 24 and 37 basis points per quarter, significant at the 1% level. The bottom parts of Panels A and B presents the performance of funds that participated in multi-fund sales. Although stocks sold by a fund do not affect future performance of that fund, participation in good trades, whether buys or sells, might signal the skill of the manager. However, the results indicate that there is little difference in quarterly returns of funds that have a sell based on centralized research and those that have not.

In line with other research, long-only portfolios of funds underperform benchmarks by up to about 0.35% per quarter. Interestingly, the negative performance is generally less pronounced for funds which participate in centralized trades. In fact, when these funds are equally weighted, their alphas are statistically indistinguishable from zero. The alphas of the TNA-weighted portfolio are strongly negative, but, at least for centralized purchases, they tend to be much smaller than those for the remaining funds. For example, the TNA-weighted four-factor alphas of funds with centralized trade are -0.28% (-0.13%) for two-fund (three-fund) centralized trades, while the alphas of the remaining funds are -0.40% (-0.40%).

Table VIII provides an additional test of fund performance by regressing quarterly (first

four columns) and annual (last four columns) after-fee fund returns on dummy variables that indicate that a fund participated in a centralized trade in the previous quarter and a set of controls. Fund-level controls include fund size, expense ratio, turnover, and past performance, while the company-level controls include size, the number of funds, and the number of styles of the management company. Regressions are run on the cross-section of funds in each sample quarter and the estimates reported in the table, as well as their t-statistics, are based on the time series of cross-sectional estimates. Although the regressions are run every quarter, some dependent variables, e.g., expense ratios, are reported only once per year and thus are the same in four different regressions. Moreover, when the dependent variable is the annual return, its realizations are correlated across four consecutive cross-sectional regressions. Standard errors are corrected for potential problems this may cause by using the Newey-West weighting matrix.

The first four columns of Table VIII indicate that participating in a centralized purchase increases a fund's next quarter return by about 12 basis points. After the controls are included, this estimate decreases to about 9 basis points per quarter, but it is still statistically significant. Participating in centralized sales also correlates with higher future returns, but, in line with the findings from Table VII, these estimates are not significant. The last four columns deal with annual fund returns. The univariate specification indicates that funds that made a centralized purchase earn 0.45% more than other funds. When fund- and company-level characteristics are included, the estimates drops to 0.2-0.27% per year, but are still significant at the 5% level. Interestingly, in the annual return regressions, making a centralized sale yields estimates of similar magnitudes as purchasing, but these estimates are insignificant when any controls are added (in an unreported regression, when only centralized purchases and sales are included, the sale variable drops to 0.424% with a t-statistic of 1.56).

Other results from Table VIII are generally in line with previous studies. There is a robust negative relationship between a fund's size and its returns, as documented in Chen, Hong,

Huang, and Kubik (2004). Turnover correlates positively with performance, in line with Grinblatt and Titman (1989) and Wermers (2000), but this relationship is not statistically significant. Somewhat surprisingly, while the coefficient on the expense ratio has a negative estimate, it is only significant at the 10% level. Finally, the negative coefficient of the number of styles is in line with Massa (2003) and Siggelkow (2003), who show that diversity in styles has a negative impact on performance. In line with the idea put forward in the present paper, this may mean that specialization is important for centralized research to work well. Families that spread their resources over a large number of investment styles may not produce research of the same quality as families that specialize.

Clearly, the amount of the outperformance documented in Tables VII and VIII is much smaller than that estimated for centralized trades in the previous tables. This is partly because now all costs and expenses are accounted for, but also because the previous tables specifically looked at the trades that were ex ante identified as more promising. Fund-level returns reflect the performance of not only these centralized trades, but of all other trades as well. As discussed above, such additional trades likely destroy value after expenses are deducted. All in all, there is evidence that funds which use centralized research have greater returns than funds which do not. Moreover, reliance on and the quality of centralized research are not subsumed by the most obvious fund- and management-company characteristics.

4 Conclusions

This paper studies the relative value of centralized research (information produced at the level of a fund family, e.g., by buy-side analysts) and information produced at the individual fund level. Trades that are likely based on centralized research – centralized trades – beat the benchmarks by up to 0.33% per month and outperform other fund trades by even higher margins. Abnormal returns do not revert in the next six quarters, which suggests that the

result is not driven by transitory liquidity effects. The value of centralized research is higher when it involves companies that did not experience large revisions in analyst EPS forecasts. It is thus possible that it reflects new information that is not yet available to sell-side analysts.

Evidence that mutual fund trades outperform is limited to trades based on centralized research. There is no evidence that the remaining (non-centralized) trades, accounting for about 70% of fund volume, perform any better than passive benchmarks even before expenses. Once transaction costs and other fund expenses are accounted for, such trades likely turn out to waste investors' money. Although the non-centralized trades are likely idiosyncratic trades of individual managers, their poor performance may not necessarily mean that managers are misguided or overconfident in their ability. It may be rational for them to engage in trades that are not designed to beat the benchmarks. Managers need to manage flows to their funds, may want to keep up with their peers and benchmarks, or perhaps window dress their portfolios to attract and retain investors using information other than fund returns (see, e.g., Sosyura, 2007).

All in all, the results of this study suggest that the quality of the management company and its research department are important determinants of fund performance. While managerial skill undoubtedly plays a role, managerial talent may be better applied to choosing particular stock picks from those suggested by centralized research rather than to generating and pursuing independent ideas.

5 Appendix

The Appendix provides additional robustness analysis of the performance of centralized trades. As in Tables V and VI, I focus on stocks at least three same-company funds bought and sold. Table AI presents results for the spread portfolio, long in buys and short in sells, as well as for the buy and the sell portfolios separately. To control for potential time variation in betas, I estimate conditional versions of the CAPM and the 4-factor model from Carhart (1997). Conditioning variables are these proposed in Ferson and Schadt (1996): one-month Treasury bill yield, the dividend yield of the NYSE-AMEX market index (obtained from CRSP), term premium (the difference between yields of long- and short-term Treasury bonds, obtained from Federal Reserve Bank of St. Louis), credit spread (the difference between yields of Moody's BAA- and AAA-rated corporate bonds, obtained from Federal Reserve Bank of St. Louis), and the January dummy. Another model adds the liquidity factor from Pastor and Stambaugh (2003) (obtained from WRDS) to the four Carhart (1997) factors. Finally, to account for other well-known patterns in the data, I add the short-term reversal factor (obtained from Ken French's website) and the idiosyncratic volatility factor (computed as proposed in Ang, Hodrick, Xing, and Zhang, 2006) to the market, size, value, and momentum factors.

Table AI presents the outperformance (alphas) measured with respect to the above models. In each case, the spread portfolio beats the benchmarks by statistically and economically meaningful numbers. Moreover, the magnitude of the estimated abnormal performance is very similar to that presented in Table III. The performance of trades based on centralized research is unlikely to be due to time variation in betas or liquidity risk, short-term reversal, or exposure to stocks with high idiosyncratic volatility.

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Table I: Summary statistics of management companies and funds these companies control. The sample spans the first quarter of 1980 through the fourth quarter of 2005 and includes all domestic equity funds. The bottom panel only includes funds managed by companies that control at least two domestic equity funds. Management companies are identified using the Thomson Financial fund holdings database. Only funds that can be identified in both the Thomson Financial and CRSP mutual fund databases are included; TNA of management companies is computed using these funds only. All estimates presented below are time-series averages of quarterly cross-sectional estimates (e.g., "median" corresponds to the time series average of medians computed in all sample quarters).

	Average	25th perc	Median	75th perc
Number of management companies	169.192	81	135	255
Number of funds per company	4.566	2.000	2.909	4.962
Number of styles per company	2.486	1.990	2.000	3.010
Company Total Net Assets (TNA) ($M)	3337.477	144.930	543.470	2083.677
All funds in the CRSP database				
Number of funds	948.798	318.000	800.000	1552.000
Fund TNA ($M)	345.105	16.217	59.459	208.865
Quarterly returns (%)	3.160	0.045	3.036	6.134
Expense ratio (%)	1.269	0.765	1.198	1.626
Front load (%)	2.434	0.166	1.349	4.968
Rear load (%)	0.525	0.121	0.352	0.750
Turnover (%)	93.952	33.590	64.932	112.904
Funds managed by companies with at least two mutual funds				
Number of funds	861.654	313.00	636.500	1360.500
Fund TNA ($M)	698.222	46.997	160.235	521.523
Quarterly returns (%)	3.383	0.498	3.258	6.104
Expense ratio (%)	1.205	0.868	1.121	1.463
Front load (%)	2.960	0.191	2.923	5.445
Rear load (%)	0.520	0.114	0.309	0.789
Turnover (%)	90.377	32.450	64.807	112.402

Table II: Common investment decisions of funds within the same management company. The first panel summarizes the number of stocks bought, sold, or traded (bought or sold) in at least two funds sponsored by the same management company, both in levels and as the fraction of all stocks bought, sold, or traded. The second panel presents dollar volume generated by management companies when they trade in multiple funds, in millions of dollars and as a fraction of total volume generated in a given quarter. All numbers are time-series averages of quarterly cross-sectional estimates (e.g., "median" corresponds to the time series average of medians computed in all sample quarters).

	Number of stocks traded in multiple portfolios			
	Average	Median	25th perc	75th perc
Number of stocks bought	28.249	7.106	0.990	26.394
Number of stocks sold	20.975	4.341	0.356	19.442
Number of stocks traded	54.345	16.284	3.106	55.269
	Fraction of stocks traded in multiple portfolios			
	Average	Median	25th perc	75th perc
% of number bought	0.161	0.103	0.018	0.235
% of number sold	0.139	0.081	0.007	0.206
% of number traded	0.189	0.139	0.038	0.283

	Dollar volume generated in multiple portfolios			
	Average	Median	25th perc	75th perc
Buy volume ($M)	325.894	16.157	0.940	118.965
Sell volume ($M)	127.348	2.981	0.015	35.652
All volume ($M)	503.873	28.184	2.651	191.457
	Fraction of volume generated in multiple portfolios			
	Average	Median	25th perc	75th perc
% of buy volume	0.289	0.224	0.032	0.482
% of sell volume	0.250	0.148	0.004	0.456
% of all volume	0.336	0.291	0.071	0.549

Table III. Performance of trades made by multiple funds within the same management company. In each sample quarter, spread portfolios are created from stocks a pre-specified number of same-company funds bought (long leg of the portfolio) or sold (short leg) in the previous quarter. Portfolios are equally-weighted (top panel), value-weighted (middle panel), and count-weighted (bottom panel), where count-based weights are proportional to the number of management companies that trade a given stock in multiple portfolios. Portfolios are held for three months following the quarter in which funds trade. Monthly average returns, alphas, and average characteristic-adjusted returns are reported in percentages. T-statistics are computed using the Newey-West weighting scheme and are reported in parentheses. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

	Stocks bought minus stocks sold in			
	exactly 1	≥ 2	≥ 3	≥ 4
	funds from the same management company			
	Equally-weighted portfolios			
Average . ret.	0.064	0.206	0.328	0.411
Standard deviation	0.677	0.831	1.329	1.784
CAPM α	0.061	0.202***	0.333***	0.408***
	(1.512)	(4.532)	(4.001)	(3.692)
FF α	0.081**	0.226***	0.358***	0.430***
	(2.264)	(4.940)	(4.422)	(3.683)
Carhart α	0.074*	0.127***	0.239***	0.327***
	(1.664)	(2.951)	(3.228)	(3.087)
Char. adjusted ret.	0.023	0.078**	0.158**	0.221**
	(0.721)	(2.199)	(2.159)	(2.161)
	Value-weighted portfolios			
Average return	-0.048	0.057	0.177	0.175
Standard deviation	0.997	0.427	1.321	1.694
CAPM α	-0.062	0.057**	0.202**	0.218**
	(-1.063)	(2.349)	(2.467)	(2.410)
FF α	-0.100*	0.059**	0.186**	0.189*
	(-1.715)	(2.320)	(2.351)	(1.884)
Carhart α	0.018	0.042*	0.157**	0.194**
	(0.330)	(1.704)	(2.078)	(2.158)
Char. adjusted ret.	0.014	0.026*	0.095	0.130*
	(0.379)	(1.662)	(1.617)	(1.799)
	Count-weighted portfolios			
Average return	-0.029	0.218	0.341	0.421
Standard deviation	0.836	0.966	1.353	1.845
CAPM α	-0.035	0.221***	0.354***	0.422***
	(-0.834)	(4.238)	(4.296)	(3.708)
FF α	-0.034	0.244***	0.375***	0.430***
	(-0.759)	(4.343)	(4.493)	(3.558)
Carhart α	0.057	0.116**	0.237***	0.310***
	(0.999)	(2.308)	(3.149)	(2.795)
Char. adjusted ret.	0.002	0.067*	0.163**	0.219**
	(0.060)	(1.782)	(2.225)	(2.103)

Table IV. Comparing performance of trades made by multiple same-company funds and trades made by unrelated funds. This table presents the performance of stocks traded in multiple same-company funds minus the performance of stocks traded in single funds by multiple management companies. In each sample quarter, two spread portfolios are created: one composed of stocks a pre-specified number of same-company funds bought (long leg of the portfolio) or sold (short leg) in the previous quarter, and one composed of stocks a pre-specified number of unrelated funds bought (long leg) or sold (short leg); a stock is included in the second portfolio only if it was not traded in multiple funds that belong to the same company. This table exhibits the differences in the performance of the two portfolios. The fourth column compares the performance of trades repeated in 4 or more same-company funds to that of trades made in single funds by at least 10% of management companies. Portfolios are equally-weighted (top panel), value-weighted (middle panel), and count-weighted (bottom panel), where count-based weights are proportional to the number of management companies that trade a given stock. Portfolios are held for three months following the quarter in which funds trade. Monthly average returns, alphas, and average characteristic-adjusted returns are reported in percentages. T-statistics are computed using the Newey-West weighting scheme and are reported in parentheses. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

	Multi-fund minus single-fund trades in			≥ 4 same-comp.
	≥ 2 funds	≥ 3 funds	≥ 4 funds	funds vs 10% of unrelated funds
		Equal-weighted portfolios		
Average return	0.146	0.293	0.399	0.425
Standard deviation	1.153	1.597	2.001	1.835
CAPM α	0.142**	0.294***	0.391***	0.414***
	(2.314)	(2.769)	(2.820)	(3.723)
FF α	0.152**	0.311***	0.415***	0.460***
	(2.544)	(3.255)	(2.911)	(4.014)
Carhart α	0.056	0.184**	0.289**	0.476***
	(0.972)	(2.127)	(2.238)	(4.385)
Char. adjusted ret.	0.146**	0.293***	0.399***	0.285***
	(2.468)	(3.154)	(3.072)	(2.741)
		Value-weighted portfolios		
Average return	0.127	0.248	0.250	0.196
Standard deviation	1.308	1.874	2.128	1.664
CAPM α	0.141**	0.286***	0.307***	0.232***
	(1.985)	(2.579)	(2.652)	(2.602)
FF α	0.178**	0.309***	0.325**	0.216**
	(2.319)	(2.729)	(2.493)	(2.299)
Carhart α	0.041	0.156	0.197*	0.236***
	(0.554)	(1.494)	(1.682)	(2.681)
Char. adjusted ret.	0.127*	0.248**	0.250**	0.146**
	(1.727)	(2.316)	(2.124)	(2.097)
		Count-weighted portfolios		
Average return	0.248	0.378	0.473	0.445
Standard deviation	1.619	1.855	2.276	1.794
CAPM α	0.258***	0.396***	0.479***	0.438***
	(3.169)	(3.581)	(3.242)	(4.077)
FF α	0.281***	0.419***	0.495***	0.477***
	(2.972)	(3.654)	(3.142)	(4.305)
Carhart α	0.060	0.186*	0.270*	0.467***
	(0.667)	(1.767)	(1.832)	(4.432)
Char. adjusted ret.	0.248***	0.378***	0.473***	0.281***
	(2.978)	(3.656)	(3.335)	(2.761)

Table V. Performance of stocks at least three same-company funds bought or sold – robustness checks. In each quarter, stocks at least three same-company funds bought or sold in the previous quarter are identified. The first two columns show performance of stocks bought and sold. The remaining columns show the performance of buy-sell spread portfolio. Portfolio in the third (fourth) column excludes stocks added or deleted from S&P500 (stock in S&P500) in the quarter in which funds trade or in the preceding quarter, portfolio in the fifth column excludes stocks with IPOs in the quarter in which funds trade or in the previous quarter, portfolio in the sixth column is formed based on the holdings reports from the first three quarters of the year (excluding the last quarterly report in each year), and the portfolio in the last column excludes centralized trades that are repeated in multiple quarters (trades in multiple funds in two or more consecutive quarters). Portfolios are equally-, value-, and count-weighted, where count-based weights are proportional to the number of management companies that trade a given stock in at least three funds. Portfolios are held for three months following the quarter in which funds trade. Monthly average returns, alphas, and average characteristic-adjusted returns are reported in percentages. T-statistics are computed using the Newey-West weighting scheme and are reported in parentheses. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

	buys only	sells only	exclude S&P500 additions deletions	exclude S&P500 stocks	exclude IPOs	exclude fourth quarter reports	exclude repeated centralized trades
				Equal-weighted portfolios			
Average return	1.402	1.074	0.320	0.446	0.283	0.373	0.288
Standard deviation	5.429	5.508	1.341	2.238	1.333	1.224	1.473
CAPM α	0.194*	-0.139	0.325***	0.438***	0.292***	0.365***	0.283***
	(1.922)	(-1.335)	(3.893)	(3.254)	(3.405)	(3.959)	(3.092)
FF α	0.131*	-0.228**	0.351***	0.458***	0.322***	0.399***	0.325***
	(1.671)	(-2.363)	(4.331)	(3.409)	(3.710)	(4.250)	(3.720)
Carhart α	0.200***	-0.040	0.231***	0.283**	0.236***	0.269***	0.196**
	(2.628)	(-0.457)	(3.102)	(2.255)	(2.934)	(3.082)	(2.428)
Char. adjusted	0.145**	-0.013	0.153**	0.265**	0.158**	0.204**	0.142*
	(2.302)	(-0.168)	(2.112)	(2.051)	(2.166)	(2.488)	(1.762)
				Value-weighted portfolios			
Average return	1.183	1.006	0.171	0.282	0.159	0.154	0.206
Standard deviation	4.471	4.621	1.306	2.409	1.343	1.113	1.489
CAPM α	0.098	-0.104	0.196**	0.291**	0.183**	0.175**	0.224***
	(1.339)	(-1.611)	(2.422)	(2.303)	(2.199)	(2.537)	(2.575)
FF α	0.142**	-0.044	0.181**	0.247*	0.164**	0.160**	0.240***
	(2.149)	(-0.735)	(2.313)	(1.844)	(2.030)	(2.213)	(2.750)
Carhart α	0.126*	-0.032	0.151**	0.243**	0.145*	0.125*	0.188**
	(1.932)	(-0.574)	(2.017)	(1.998)	(1.867)	(1.780)	(2.313)
Char. adjusted	0.026	-0.069	0.087	0.252**	0.095	0.102**	0.110*
	(0.667)	(-1.498)	(1.552)	(2.003)	(1.615)	(2.211)	(1.709)
				Count-weighted portfolios			
Average return	1.347	1.006	0.328	0.472	0.275	0.393	0.344
Standard deviation	5.355	5.515	1.368	2.267	1.322	1.251	1.538
CAPM α	0.141*	-0.213**	0.341***	0.469***	0.293***	0.395***	0.343***
	(1.658)	(-2.277)	(4.116)	(3.454)	(3.570)	(4.343)	(3.674)
FF α	0.127*	-0.248***	0.364***	0.500***	0.311***	0.420***	0.371***
	(1.721)	(-2.622)	(4.381)	(3.627)	(3.671)	(4.418)	(4.100)
Carhart α	0.186***	-0.052	0.228***	0.299**	0.205**	0.260***	0.217***
	(2.624)	(-0.612)	(3.026)	(2.390)	(2.614)	(2.896)	(2.606)
Char. adjusted	0.137**	-0.026	0.153**	0.266**	0.163**	0.226***	0.164**
	(2.190)	(-0.329)	(2.115)	(2.017)	(2.231)	(2.782)	(2.025)

Table VI. Performance of stocks three or more same-company funds trade in line with or against analyst revisions. In each quarter, stocks traded by at least three same-company funds are divided into two subsets: stocks traded "With analysts" (those that had an EPS forecast revision in the top 25% and that were bought or those that had revisions in the bottom 25% and were sold) and stocks traded "Against analysts" (the remaining ones). Within each subset, a spread portfolio is created that goes long in stocks funds bought and short in stocks funds sold. Portfolios are equally-weighted (top panel), value-weighted (middle panel), and count-weighted (bottom panel), where count-based weights are proportional to the number of management companies that trade a given stock in at least three portfolios. Portfolios are held for three months following the quarter in which funds trade. Monthly average returns, alphas, and average characteristic-adjusted returns are reported in percentages. T-statistics are computed using the Newey-West weighting scheme and are reported in parentheses. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

	Stocks $\geq$ 3 funds traded	
	Against analysts	With analysts
	Equal-weighted portfolios	
Average return	0.266	0.412
Standard deviation	1.485	4.137
CAPM α	0.278***	0.381*
	(2.781)	(1.686)
FF α	0.245***	0.592**
	(2.624)	(2.529)
Carhart α	0.249***	0.051
	(2.686)	(0.241)
Char. adjusted ret.	0.154**	-0.046
	(2.136)	(-0.229)
	Value-weighted portfolios	
Average return	0.149	0.227
Standard deviation	1.684	4.425
CAPM α	0.201**	0.159
	(2.010)	(0.615)
FF α	0.127	0.401
	(1.323)	(1.476)
Carhart α	0.194**	-0.141
	(2.196)	(-0.582)
Char. adjusted ret.	0.062	0.005
	(0.970)	(0.027)
	Count-weighted portfolios	
Average return	0.281	0.358
Standard deviation	1.467	4.445
CAPM α	0.306***	0.327
	(3.123)	(1.289)
FF α	0.259***	0.559**
	(2.849)	(2.198)
Carhart α	0.250***	-0.042
	(2.832)	(-0.187)
Char. adjusted ret.	0.153**	-0.057
	(2.148)	(-0.271)

Table VII: Impact of multi-fund trades on overall fund returns. Each quarter, mutual funds are divided into those that participated/ not participated in a purchase/ sale that was repeated by at least two (Panel A) and at least three (Panel B) funds from the same management company. In each subset fund portfolios are formed on the first day of the subsequent quarter. These portfolios are held for 3 months and then rebalanced based on the next batch of holdings reports. Fund returns are net of fees. Front and rear-end loads are amortized over a 7-year holding period (as in Sirri and Tufano, 1998) and subtracted from fund returns. The table illustrates the performance of equal- and TNA-weighted fund portfolios. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

Panel A: centralized trades are trades at least two same-company funds make

Comparing funds that participated/ not participated in a multi-fund buy

	Equal-weighted portfolios			TNA-weighted portfolios		
	Central buy	No central buy	diff	Central buy	No central buy	diff
Average return	3.381	3.263	0.117	3.226	3.093	0.134
Standard deviation	8.208	8.374	0.504	7.796	8.014	0.836
CAPM α	-0.065	-0.221	0.156***	-0.126	-0.314***	0.188**
	(-0.432)	(-1.343)	(2.811)	(-1.124)	(-2.733)	(2.237)
FF α	-0.036	-0.170	0.134**	-0.236**	-0.280***	0.044
	(-0.304)	(-1.426)	(2.314)	(-2.533)	(-2.960)	(0.704)
Carhart α	-0.160	-0.298**	0.138**	-0.281***	-0.397***	0.116*
	(-1.586)	(-2.522)	(2.281)	(-3.168)	(-3.900)	(1.766)
# funds	708.510	1183.029		708.510	1183.029	

Comparing funds that participated/ not participated in a multi-fund sell

	Equal-weighted portfolios			TNA-weighted portfolios		
	Central sell	No central sell	diff	Central sell	No central sell	diff
Average return	3.359	3.289	0.071	3.184	3.141	0.042
St. dev.	8.236	8.380	0.627	7.802	8.074	1.043
CAPM α	-0.092	-0.195	0.103	-0.170	-0.278**	0.108
	(-0.581)	(-1.153)	(1.456)	(-1.511)	(-2.172)	(1.096)
FF α	-0.063	-0.147	0.085	-0.267***	-0.209*	-0.058
	(-0.490)	(-1.246)	(1.356)	(-2.702)	(-1.943)	(-0.635)
Carhart α	-0.184	-0.296***	0.113*	-0.324***	-0.353***	0.029
	(-1.608)	(-2.605)	(1.855)	(-3.444)	(-3.193)	(0.316)
# funds	944.404	947.135		944.404	947.135	

Table VII, continued

Panel B: centralized trades are trades at least three same-company funds make

Comparing funds that participated/ not participated in a multi-fund buy

	Equal-weighted portfolios			TNA-weighted portfolios		
	Central buy	No central buy	diff	Central buy	No central buy	diff
Average return	3.479	3.290	0.189	3.392	3.084	0.309
St. dev.	8.182	8.346	0.736	7.783	7.965	1.110
CAPM α	0.044	-0.188	0.232**	0.054	-0.312***	0.367***
	(0.286)	(-1.145)	(2.544)	(0.424)	(-2.741)	(3.300)
FF α	0.063	-0.145	0.208***	-0.065	-0.306***	0.240***
	(0.436)	(-1.283)	(2.668)	(-0.566)	(-3.365)	(2.692)
Carhart α	-0.066	-0.270**	0.203**	-0.129	-0.402***	0.273***
	(-0.557)	(-2.396)	(2.451)	(-1.226)	(-4.095)	(2.764)
# funds	447.894	1443.644		447.894	1443.644	

Comparing funds that participated/ not participated in a multi-fund sell

	Equal-weighted portfolios			TNA-weighted portfolios		
	Central sell	No central sell	diff	Central sell	No central sell	diff
Average return	3.401	3.324	0.076	3.302	3.137	0.164
St. dev.	8.309	8.331	0.885	7.928	7.968	1.374
CAPM α	-0.063	-0.149	0.085	-0.068	-0.257**	0.189
	(-0.386)	(-0.882)	(0.787)	(-0.487)	(-2.040)	(1.406)
FF α	-0.030	-0.110	0.080	-0.166	-0.244**	0.078
	(-0.211)	(-0.947)	(0.891)	(-1.272)	(-2.467)	(0.651)
Carhart α	-0.160	-0.248**	0.087	-0.247**	-0.349***	0.102
	(-1.245)	(-2.227)	(0.990)	(-2.075)	(-3.353)	(0.837)
# funds	574.452	1317.086		574.452	1317.086	

Table VIII. Centralized trades and after-fee fund performance. This table presents regressions of individual fund quarterly (first four columns) and annual (last four columns) returns on dummy variables that indicate whether a fund took part in a multi-fund buy (sell) in the previous quarter. Additional controls include fund characteristics (TNA, expense ratios, turnover, past performance) and management company characteristics (TNA, number of funds, number of styles). Regressions are estimated in each sample quarter using all domestic equity funds controlled by companies that sponsor at least two such funds. Estimates and Newey-West standard errors are based on the time series of cross-sectional estimates. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

	Dependent variable: next quarter returns				Dependent variable: next year returns			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Made centralized purchase	0.117**		0.094**	0.086**	0.450***		0.269**	0.202**
indicator	(2.245)		(2.124)	(2.114)	(2.613)		(2.109)	(2.241)
Made centralized sale		0.071		0.024		0.528*		0.278
indicator		(1.046)		(0.346)		(1.899)		(1.363)
log(TNA)			-0.161***	-0.159***			-0.665***	-0.670***
			(-2.803)	(-2.752)			(-2.938)	(-2.931)
Expense ratio (in %)			-0.250*	-0.252*			-0.816	-0.805
			(-1.797)	(-1.828)			(-1.519)	(-1.489)
Turnover ratio			0.174	0.171			0.803	0.782
			(1.121)	(1.102)			(1.427)	(1.386)
Past returns (36m)			0.009*	0.009*			0.028	0.028
			(1.943)	(1.925)			(1.604)	(1.597)
Mgmnt. comp. log(TNA)			0.083*	0.084*			0.301	0.302
			(1.790)	(1.808)			(1.330)	(1.332)
Mgmnt comp. log(# funds)			0.092	0.098			0.517	0.496
			(1.065)	(1.197)			(1.616)	(1.562)
Mgmnt. comp. # styles			-0.125	-0.127			-0.307	-0.345
			(-1.086)	(-1.055)			(-0.841)	(-0.922)
constant	3.263***	3.289***	3.039***	3.028***	12.915***	12.912***	12.406***	12.447***
	(5.218)	(5.319)	(6.605)	(6.607)	(5.644)	(5.765)	(7.142)	(7.195)
R^2	0.003	0.004	0.170	0.172	0.003	0.005	0.184	0.187
avg # obs/quarter	1785.769	1785.769	1428.580	1428.580	1730.644	1730.644	1398.710	1398.710
# quarters	104	104	100	100	104	104	100	100

Table AI. Alternative measures of performance of centralized trades. Columns correspond to portfolios of stocks bought, sold, and a spread portfolio long in stocks bought and short in stocks sold by at least three same-company funds. Portfolios are held for three months following the quarter in which funds trade. Portfolios are equally-weighted (top panel), value-weighted (middle panel), and count-weighted (bottom panel), where count-based weights are proportional to the number of management companies that trade a given stock in multiple portfolios. In each panel, performance measures are alphas (expressed in percentage points) from the conditional CAPM and the conditional version of Carhart (1997), in which betas depend on the variables proposed in Ferson and Schadt (1996), a five-factor model that adds the Pastor and Stambaugh (2003) liquidity factor to the four factors from Carhart (1997), and a six-factor model that adds a short-term reversal factor and the idiosyncratic-risk factor (IVOL) of Ang et al (2006) to the four factors from Carhart (1997). T-statistics are computed using the Newey-West weighting scheme and are reported in parentheses. ***, **, and * denote that an estimate is significant at the 1%, 5%, and 10% level, respectively.

	Buys	Sells	Buys-Sells
	Equal-weighted portfolios		
Conditional CAPM α	0.148	-0.153	0.301***
	(1.470)	(-1.368)	(3.621)
Conditional Carhart α	0.115*	-0.077	0.192***
	(1.664)	(-0.936)	(2.580)
Carhart + liquidity α	0.197***	-0.042	0.239***
	(2.658)	(-0.490)	(3.228)
Carhart + reversal + IVOL α	0.179**	-0.072	0.251***
	(2.324)	(-0.904)	(3.671)
	Value-weighted portfolios		
Conditional CAPM α	0.091	-0.093	0.185**
	(1.271)	(-1.378)	(2.347)
Conditional Carhart α	0.100*	-0.039	0.139**
	(1.778)	(-0.740)	(2.170)
Carhart + liquidity α	0.124*	-0.032	0.156**
	(1.909)	(-0.582)	(2.091)
Carhart + reversal + IVOL α	0.173**	-0.022	0.195**
	(2.670)	(-0.395)	(2.562)
	Count-weighted portfolios		
Conditional CAPM	0.108	-0.210**	0.317***
	(1.289)	(-2.085)	(3.735)
Conditional Carhart α	0.096	-0.084	0.180**
	(1.444)	(-1.052)	(2.377)
Carhart + liquidity α	0.183***	-0.054	0.237***
	(2.632)	(-0.634)	(3.148)
Carhart + reversal + IVOL α	0.180***	-0.077	0.257***
	(2.589)	(-0.979)	(3.690)

Figure 1. Long-term performance of stocks at least three same-company funds trade. At the end of the quarter in which management companies report their holdings, stocks bought or sold by at least three same-company funds are identified. Equal-, value-, and count-weighted portfolios long in stocks bought and short in stocks sold are formed in the quarter after the report is released (2, 3, ..., 5 quarters after the report) and are held for three months. Figure 1 presents three- and four-factor monthly alphas of these portfolios, as a function of the delay between the quarter in which funds trade and portfolio formation. Dash-dotted lines represent 95% confidence bounds; standard errors are computed using the Newey-West weighting scheme. A dotted line denoting zero alpha is superimposed on the graphs.