CFR Working Paper NO. 15-02

Speed of Information Diffusion within Fund Families

G. Cici • S. Jaspersen • A. Kempf

centre for financial Research
Look deeper

Speed of Information Diffusion within Fund Families

Gjergji Cici, Stefan Jaspersen, and Alexander Kempf*

This Draft: July 2015

ABSTRACT

We document that the speed of information dissemination within mutual fund families positively affects the performance of member funds. This suggests that the resulting benefits of higher information precision far outweigh free-riding costs associated with fast internal dissemination. The performance effect intensifies when information travels across managers from different rather than same styles. This is consistent with fast information diffusion aggregating complementary insights that sharpen information precision, but also with fewer free-riding opportunities among managers from different styles. Managers exploit the resulting higher information precision rationally by trading more, relying less on public information, and investing differently from unaffiliated peers.

JEL *classification:* D23; D830; G23; L22

Keywords: Information diffusion; mutual fund performance; fund families; investment behavior; organizational structures

* Cici is from Mason School of Business, The College of William & Mary. E-mail: gjergji.cici@mason.wm.edu. Cici is also a Research Fellow at the Centre for Financial Research (CFR), University of Cologne. Jaspersen is from Department of Finance and Centre for Financial Research (CFR), University of Cologne. E-mail: jaspersen@wiso.uni-koeln.de. Kempf is from Department of Finance and Centre for Financial Research (CFR), University of Cologne. E-mail: kempf@wiso.uni-koeln.de. We would like to thank Tim Adam, Tom Brakke, Mark Ebers, Monika Gehde-Trapp, Peter Limbach, Pedro Matos, Daniel Metzger, Alexandra Niessen-Ruenzi, Oliver Spalt, Noah Stoffman, Florian Weigert, and Haoping Xu for helpful comments on an earlier draft of the paper.

Timely dissemination of information within organizations is important. For example, in a typical corporation, it can have a positive effect by increasing efficiency of supply chain management, shortening product development cycles, and improving decision making by senior management in response to changing market conditions. However, quick internal transmission of information could also have a negative effect. By making information readily available, it can provide free-riding incentives for some members of the organization (see, e.g., Cabrera and Cabrera (2002)).[1] For example, a division manager might spend less effort developing new production techniques if she is quickly informed of innovations introduced by managers of other divisions. However, despite fast internal dissemination of information potentially affecting organizations in diametrically opposed yet important ways, little is known in the literature of its net effect on the performance of business organizations.

In this paper, we use the mutual fund industry as a testing laboratory to examine how speed of information flows within an organization affects performance. Using the mutual fund industry is attractive for several reasons: First, the dichotomous effects associated with speed of internal information dissemination can be as, or even more, pronounced in this industry. On one hand, the presence of highly efficient financial markets, which quickly impound new information into security prices, make timely internal dissemination of information indispensable to exploiting trading opportunities. On the other hand, fund managers who are quickly informed of the investment ideas of their colleagues will find it easier to free-ride on their colleagues' efforts. Second, measuring the speed of information dissemination within a fund family is relatively easy because mutual fund managers trade in response to new information, and we are able to observe their trades. Measuring the speed of information flows

[1] Free-riding and its adverse effects in intra-firm settings have been studied in a large economics literature, starting with Olson (1965) and Alchian and Demsetz (1972) and continuing with Holmstrom (1982), Radner, Myerson, and Maskin (1986), Ma, Moore, and Turnbull (1988), Legros and Matthews (1993), Williams and Radner (1994), Strausz (1999), Hamilton, Nickerson, and Owan (2003), Winter (2004), and Bonatti and Hörner (2011).

within a corporation is much more difficult because detailed internal data is typically unavailable. Finally, the mutual fund industry setting allows for a much richer analysis. The reason is that for fund families we can assess the performance effect of the speed of internal information diffusion at the organizational unit level (i.e., fund level) because measuring mutual performance is relatively straightforward. For corporations, this kind of detailed analysis is more challenging since performance data at the organizational unit level is not uniformly available.

Our approach for measuring the speed of information transmission within a fund family is intuitively straightforward. Since information makes investors trade (see, e.g., Milgrom and Stokey (1982)), we can trace the spread of information within a fund family from the trades of affiliated mutual funds. That is, following the introduction of new information on a particular stock to a fund family, the sequence of affiliated fund trades on that same stock should tell us how fast information travels within the fund family. We use this insight to construct our *SID* (Speed of Information Diffusion) measure. *SID* is not only computationally attractive because it simply relies on changes in fund holdings but also withstands intuitive validation tests, which show that *SID* is indeed higher if the family has fewer barriers that impede information flows.[2]

Our main investigation explores whether faster information transmission within a fund family leads to superior performance for the member funds. The answer depends on which of the two opposing effects dominates: First, quick information dissemination is expected to give a manager faster access to the information generated by other managers in the family.[3] This increases the precision of the manager's own information, leading to better investment decisions and consequently better performance.[4] However, fast internal diffusion of information could

[2] We argue that information barriers are less likely when the family has fewer outsourced funds managed by external advisors, fewer managers, and more connections among its managers through joint management of funds.

[3] At the very least, a fund manager would want to transmit her information to other managers driven by self-interest. By doing so, she can validate her ideas based on feedback from colleagues or benefit from the future ideas of her colleagues (see, e.g., Stein (2008) and Pool, Stoffman, and Yonker (2013)).

[4] A manager who is researching a particular company is in effect trying to collect many of the scattered pieces of an "information" mosaic, which when placed together, help generate a more complete picture of the

also provide incentives for a portfolio manager to free-ride on the ideas of her colleagues and make no effort to expand or increase precision of her own information set, potentially having a negative impact on fund performance.

Our results from a broad sample of fund families and their actively-managed US domestic equity funds during 2004 – 2012 show that the net effect of fast information diffusion on performance is positive. Funds from families with high *SID* (relative to the median family) outperform funds from families with low *SID* by 64 basis points per year based on Carhart-alpha comparisons. Our results hold even after controlling for the amount of information that is produced in the family, the general tendency of the affiliated funds to trade with each other, and other fund and family characteristics known to affect performance. This suggests that the active efforts of some fund families to reduce information barriers and increase speed of information flows internally are justified by concrete performance benefits.[5]

We rule out several alternative explanations for the superior performance of funds from high-*SID* families: First, families that subsidize their "high value" funds (see Gaspar, Massa, and Matos (2006)) could have lower *SID* values simply because they give their best ideas, hot IPOs for example, to their high value funds first. If these families are afflicted by agency problems, the performance effect we document could simply reflect agency costs being borne by most funds in low-*SID* fund families. We rule this out by modifying our *SID* measure to include only trade sequences that start more than six months after a stock's IPO or have at least one low value fund buying the stock at the beginning of the trade sequence and still

---

company. The manager can find some of the pieces herself based on her own efforts and obtain others from her colleagues. The sooner the manager obtains the other pieces from her colleagues, the sooner she is able to assemble a precise picture of the company and trade on this information.

5 Many fund companies actively try to limit internal information barriers. For example, Third Avenue Management recently instituted changes intended to "[break] down barriers among investment teams" (Feldman (2015)). Columbia Threadneedle Investments employs incentives in their managers' compensation structure to encourage active exchange and communication of ideas (Columbia Threadneedle Investments (2015)). Consistent with attempts to reduce physical barriers, other families structure their processes so that employees from different funds are in close proximity to each other. For example, Goodman (2012), referring to Fidelity, writes that " Each fixed-income team is housed in a surprisingly small "pod" -- a semicircle of desks, Bloomberg terminals, computer monitors, and stacks of paper -- where the portfolio managers, analysts, and traders sit."

documenting an outperformance of funds in high-*SID* families. Second, we rule out that our *SID* measure captures unobserved family characteristics unrelated to information by employing a placebo test that relates *SID* to the performance of index funds. Index funds do not trade on information and their performance should be unaffected by speed of internal diffusion of information. We rule out that our results are spurious by documenting no significant effect of the speed of information diffusion on the performance of index funds. Finally, we rule out reverse causality by exploiting shocks to *SID* arising as a result of certain M&A deals among asset management firms that were more likely to have happened for exogenous reasons.[6] Employing a Difference-in-Differences approach, we find that the resulting shifts in the speed of information diffusion lead to significant changes in performance after the change. This evidence helps strengthen the causal interpretation of the relation between speed of information diffusion and fund performance.

Although fast information diffusion facilitates information transfers among all managers of a given family, we hypothesize that fast information transfers among managers following the same investment style have a weaker performance effect than fast information transfers among managers following different investment styles. The rationale is twofold: First, managers from the same style have similar skills, which means that fast information transfers among them can do little to improve their information precision. Second, fast information transfers among managers from the same style will afford them more opportunities to free-ride on each other's efforts given their shared investment universe, which allows them to invest in the same stocks. This could cause these managers to exert less effort into improving the precision of their own information. On the contrary, managers from different styles have different skills with potential complementarities that create value by increasing managers' information precision. They also

[6] Specifically, after the start of the crisis many asset management divisions of bank-holding companies were deemed non-essential businesses and were divested by their bank-holding parent companies as they tried to improve their capital base and focus on their core banking business. We are not the first to exploit this particular exogenous shock. Ferreira, Matos, and Pires (2015) use a similar approach to draw causal inferences with respect to bank-run funds being used to support the parent banks' core business.

have fewer opportunities to free-ride on each other's efforts, given the lower overlap in their investment universes. To test this hypothesis, we introduce two modified versions of *SID* that, respectively, measure speed of information dissemination across managers that follow the same styles (SID_{Within}) and among those that follow different styles (SID_{Across}). Our hypothesis finds strong support. The performance effect of the cross-style measure is significantly stronger than the performance effect of the within-style measure.[7] Moreover, we document that only the cross-style measure positively and significantly affects fund performance.

Finally, we argue that if managers from high-SID_{Across} families are able to generate more precise information, these managers should actively exploit this advantage in the following ways. First, these managers are expected to trade more in order to take advantage of their higher information precision. This is consistent with Chen, Jegadeesh, and Wermers (2000), who suggest that managers who are able to generate superior information "…trade frequently, while managers with more limited skills may be much more cautious in their trades."[8] Second, higher information precision is expected to reduce their reliance on public information. This is consistent with the view of Kazperczyk and Seru (2007) that the sensitivity of a manager's portfolio holdings to changes in public information decreases in the precision of her own information. Finally, we expect these managers' portfolios to be different from those of their unaffiliated peer funds. This is because when SID_{Across} is high, the resulting higher precision of internally-generated information applies to stocks from all the different style-defined universes followed by the various affiliated managers. This will likely provide a given manager with unique investment ideas outside or at the periphery of his own style-defined stock universe,

[7] This is consistent with Hamilton, Nickerson, and Owan (2003) whose study of team participation and composition in a garment plant shows that teams with more heterogeneous skills were more productive. However, their study and ours focus on different aspects of skill heterogeneity. They define skill heterogeneity to mean that workers have different levels of skills whereby some workers are more skilled than others with respect to the same tasks, while we define heterogeneity to mean workers having distinct skills associated with investments in distinct stock universes.

[8] Another way to think of this effect is that timely information flows across the units of a family are likely to help fund managers update their information sets more frequently and find more investment opportunities which, consequently, makes them trade more often.

causing her to invest differently from her peer funds. Our results support all three empirical predictions.

Our paper contributes to the literature that studies knowledge transfer and cooperation among organizational units in an organization (see, e.g., Tsai (2001) and Hansen (2002)). This literature suggests that recognizing and exploiting synergies between organizational units can lead to more efficient operations, better utilization of resources, and better overall performance (see, e.g., Gupta and Govindarajan (1986) and Tsai and Ghoshal (1998)). We contribute to this literature by exploiting the unique setting of the mutual fund industry in which the organizational units of a fund family can be easily identified and the effect of timely cross-unit knowledge transfer on performance can be easily measured. Our findings suggest that by reducing internal information barriers and allowing internal information to travel promptly, companies can unlock cross-unit synergies and increase overall performance.

We also add to a growing literature that studies how the organization of mutual fund companies affects fund performance. Kacperczyk and Seru (2012) study the impact that centralized decision making in fund families has on fund performance. Pollet and Wilson (2008) provide evidence that the size of a fund family has an impact on the diversification strategy of the affiliated funds. Fang, Kempf, and Trapp (2014) find that fund families allocate managers with higher skills to the less efficient market segments and Cici, Dahm, and Kempf (2014) show that fund families with more efficient trading desks help their member funds generate better performance by keeping trading costs in check. Several other papers show that fund families can affect performance of member funds in more subtle ways, for example, by promoting certain funds at the expense of the others (see, e.g., Nanda, Wang, and Zheng (2004), Gaspar, Massa, and Matos (2006), Goncalves-Pinto and Schmidt (2013), and Eisele, Nefedova, and Parise (2014)). We contribute to this literature by showing that an organizational structure that is characterized by a faster diffusion of investment ideas has a positive impact on the performance of the affiliated funds.

The remainder of the paper is organized as follows. In Section 1, we describe the data and the construction of our measure of the speed of information diffusion (*SID*). Section 2 presents the empirical results for the impact of the speed of information diffusion on the performance of the affiliated mutual funds and rules out alternative explanations as well as endogeneity concerns. In Section 3, we examine whether fast information transfers are particularly useful when they take place among managers following different styles. Section 4 shows how fund managers adjust their trading behavior in response to advantages associated with speedy information diffusion. In Section 5 we present various robustness tests for our main finding, and Section 6 concludes.

1 Data and methodology

1.1 Data sources

We obtain information on fund returns, total net assets under management, fund fees, fund age, investment objectives, and other fund characteristics from the CRSP Survivor-Bias-Free U.S. Mutual Fund Database (CRSP MF). Information provided at the share-class level is aggregated at the fund level by value-weighting all share classes of a fund. We use the management company code from CRSP MF to identify the fund families to which funds belong.

We merge the CRSP MF database with the Thomson Reuters Mutual Fund Holdings Database (MF Holdings) using the MFLINK tables. With regards to funds' portfolio holdings, we focus only on holdings of common stocks (share codes 10 and 11) and obtain additional information about these stocks from the CRSP Monthly Stock Database.

Our final data source is the Morningstar Direct Mutual Fund Database (MS Direct) which provides information about fund managers. We merge MS Direct with the CRSP MF and MF Holdings data using fund cusips. We manually check for different spellings of the same manager to come up with a unique identifier for each fund manager. In case of inconsistent manager information across share classes, we check the manager information in the fund's

Statement of Additional Information (SAI) contained in forms 485APOS and 485BPOS filed with the SEC.

Our final sample consists of actively managed diversified U.S. domestic equity funds for the June 2004 to March 2012 period.[9] Our sample selection approach consists of the following steps. We first eliminate all international, sector, balanced, bond, index, and money market funds from the data set. Then we exclude all funds that hold less than 50 percent of their assets in common stocks or hold less than ten stocks, on average. The remaining funds are categorized into six style categories (Mid Cap (EDCM), Small Cap (EDCS), Micro Cap (EDCI), Growth (EDYG), Growth & Income (EDYB), and Income (EDYI)) according to their dominating objective code from the CRSP MF database.[10] Finally, we exclude all funds that belong to very small fund families, i.e., families with less than five funds, since the interaction in such small families might be different from the interaction in families of typical size.[11] Our final sample consists of 159 families with 1,708 funds managed by 3,101 distinct managers during our sample period.

1.2 Measuring information diffusion within a fund family

Our measure of the speed of information transmission within a fund family relies on a basic insight. Fast information diffusion allows information to spread out quickly in the organization, causing fund managers to trade instantly and simultaneously. Alternatively, slow information diffusion allows information to spread out gradually in the organization, causing fund managers to trade consecutively.

---

9 The starting date is determined by the fact that the required reporting frequency of funds changes from semi-annually to quarterly in May 2004.

10 We use the recently introduced CRSP Style Code, which aggregates the information from the previously used Lipper objective codes, Strategic Insight objective codes, and Wiesenberger objective codes. In the rare cases that a share class does not have CRSP Style Code information, we use the old classification according to Lipper, Strategic Insight, and Wiesenberger to identify the dominating objective.

11 As documented in the robustness section, our main result does not change when we alter this restriction to include families with at least three or ten funds.

To implement this idea, we need to identify instances when new information is introduced in the family by one or multiple managers. This is likely to happen when a single or multiple managers start buying a stock that is not already held by any fund in the family. Alexander, Cici, and Gibson (2007) show that such decisions reflect "strongly positive valuation beliefs", which we argue to be triggered by newly-generated information. We refer to the interval during which information embedded in the initial buying decisions does not change as an information interval and the point when the initial stock purchase happens as the start of the information interval. As long as the original information generated by the initiating managers does not change, those managers will keep the stock in their portfolio. In other words, as soon as at least one initiating manager removes the stock from her portfolio, we assume that the original information has been updated, and at this point the information interval has ended.

To capture information diffusion within the family following an initiating stock purchase, we measure the speed with which other funds in the family buy the stock during an information interval. More specifically, we count how many funds in the family buy stock *s* during quarter *q* when the stock was first added to the family portfolio and how many funds follow later during the information interval.[12] Thus, our measure of information diffusion for a single information interval is defined as:

$$ID_{s,q} = \frac{I-1}{I+J-1}, \tag{1}$$

where *I* is the number of funds buying in quarter *q* and *J* the number of funds that follow later during the information interval. Since information diffusion can be observed only when at

[12] As shown in the robustness section, results remain qualitatively similar when we employ both initiating buys and terminating sales to construct our *SID* measure. However, because non-information factors could potentially affect stock sales, in the rest of the paper we limit the calculation of our measure to initiating buys. For example, stock sale decisions could be affected by behavioral biases such as the rank effect or the disposition effect, which have been documented for at least a subset of U.S. fund managers (e.g., Frazzini (2006), Jin and Scherbina (2011), Cici (2012), and Hartzmark (2015)).

least two funds trade stock *s* (*I*+*J* >1), our measure of information diffusion is bounded between zero and one. Larger values indicate a higher speed of information diffusion within the family. In the extreme case when all funds buying stock *s* do so in quarter *q*, *ID* equals one. In the other extreme, when all funds follow the initiating fund in later periods, then *ID* equals zero.[13]

Our measure of the speed of information diffusion at the family level for quarter *t*, denoted by SID_t, is computed by averaging the *ID* measures corresponding to information intervals, the last purchase of which happens during the last four quarters including quarter *t*. We perform the aggregation over the last four quarters rather than the last quarter, quarter *t*, to control for possible seasonal effects in information generation as documented in Ozsoylev et al. (2014).[14]

1.3 Sample characteristics

Panel A of Table 1 reports statistics for our *SID* variable, while Panel B reports summary statistics for key variables, both at the fund and the family level. We present information for the whole sample as well as for subsamples constructed by stratifying the sample families into high (above median) and low (below median) *SID* families in each period. We test for differences in means between the subsamples using t-tests.

– Insert TABLE 1 approximately here –

Panel A of Table 1 shows that *SID* has a mean of 0.39, suggesting that when a new stock is introduced in the family, out of all funds that buy that stock, almost 40 percent buy it right at the beginning of the information interval, with the rest of funds following later. Importantly,

[13] Our results are robust when we also employ an alternative way to construct our *SID* measure based on initiating active bets for stocks already existing in the aggregate family portfolio. The results are presented in the robustness section.

[14] Results reported in the robustness section show that our results are robust when we aggregate the stock-specific information diffusion measures of (1) over 1, 2 or 8 quarters, respectively.

SID exhibits high serial correlation of 94 percent, which is not surprising since family-specific policies that shape internal information dissemination are not expected to change that often. Panel B of Table 1 shows that high-*SID* families are slightly bigger than low-*SID* families as can be seen from the assets under management and the number of funds in the family. They also have a higher number of investment objectives.

In terms of fund characteristics, we find that the typical fund in our sample has an average size of $1.7 billion, is 16 years old, and has an expense ratio of 1.2 percent. While fund age and total expense ratio are not significantly different when comparing high- and low-*SID* families, high-*SID* families have significantly smaller funds ($1.6 billion versus $1.9 billion). Funds from high-*SID* families also trade significantly more, possibly because timely information flows from other funds in the family enable them to update their information set more frequently.

1.4 Does *SID* actually measure speed of information diffusion?

To make sure that our *SID* measure indeed captures speed of information diffusion within a fund family, we perform a validation exercise. The premise of this investigation is that information should travel faster within families that have fewer information barriers, and thus empirically we should observe these families to have higher *SID.*

Along these lines, we argue that a family has fewer information barriers when: (1) the family funds are primarily run by in-house managers; (2) there are fewer fund managers in the family; and (3) the fund managers are interconnected to a greater extent. The reasons why these family characteristics are associated with fewer information barriers are as follows. Managers of outsourced funds belong to other investment management companies, which makes it less likely that they communicate and share ideas with in-house managers. Thus, in families with fewer outsourced funds, information barriers should be lower. Second, a smaller number of fund managers within a fund family makes it more likely for the affiliated managers to know each other well, communicate frequently, and reduce coordination costs (see, e.g., Becker and

Murphy (1992)). Finally, when fund managers work more closely together, they are more likely to communicate with each other, thus causing information to travel more freely within the fund family.[15] To test the hypothesis that *SID* is higher when these information barriers are weaker, we run the following pooled regression:

$$SID_{f,t} = \alpha + \beta_1 FamComm_{f,t-1} + \gamma' X_{i,t-1} + \varepsilon_{f,t} \tag{2}$$

FamComm is our main variable of interest. It captures the factors that presumably affect the communication barriers within the fund family (proportion of outsourced funds in the family, number of managers in the family, and interconnectedness of managers in the family). $X_{i,t-1}$ is a vector of control variables to control for general differences in fund families. In particular, we add the logarithm of total net assets under management of the fund family (*FamSize*), the logarithm of the number of funds in the family (*# Funds*), and the logarithm of the number of different investment objectives within the family (*# Objectives*). All independent variables are lagged by one quarter. We additionally include time fixed effects and cluster standard errors at the family level. The regression results are reported in Table 2.

– Insert TABLE 2 approximately here –

The results in Table 2 support our hypothesis that speed of information dissemination within a fund family is negatively affected by the presence of information barriers. Specifically, speed of information diffusion within a fund family is higher when the family outsources fewer funds, houses fewer managers, and has managers that are interconnected to a greater extent.

---

15 We measure interconnectedness by calculating the density of the network of managers within the family. In particular, the network density within a fund family is the actual number of connections between two managers resulting from the co-management of at least one fund divided by the number of potential connections.

This provides support for *SID* being a measure of speed of information flows within the fund family.

2 Impact of speed of information diffusion on investment performance

In this section we examine whether speed of information diffusion within families affects fund performance. We formally test this hypothesis in Section 2.1. Then, in Section 2.2, we explore alternative explanations and address reverse causality concerns to strengthen the interpretation of our results.

2.1 Does speed of information diffusion improve fund performance?

To examine the performance effect of fast internal information dissemination, we employ the Jensen (1968) 1-factor model, the Fama and French (1993) 3-factor model, and the Carhart (1997) 4-factor model, respectively, as measures of fund performance. Quarterly alphas are constructed as the difference of the realized excess fund return and the expected excess fund return in the quarter (each compounded over the three monthly observations in the quarter). We use gross-of-fee returns (obtained by adding back one twelfth of the annual total expense ratio to the net-of-fee return) to calculate alphas since gross returns better reflect the investment ability of fund managers.[16] A fund's expected return in a given month is calculated using factor loadings estimated over the previous 24 months and factor returns in that month.[17]

To get a first impression on whether faster information diffusion within a fund family results in superior performance for the member funds, we conduct a univariate comparison of the average performance of funds in high-*SID* families and funds in low-*SID* families

---

[16] For robustness, we ran the analysis also based on net-of-fee returns. As shown in the robustness section, our main result does not change when using net-of-fee returns.

[17] Monthly factors are obtained from Kenneth French's website. Monthly alphas and factor loadings are only calculated, if none of the returns in the past 24 months is missing. This way of calculating fund performance helps alleviate the incubation bias (Evans (2010)). As shown in the robustness section, our main result does not change when we estimate factor loadings over the previous 12 or 36 months.

(untabulated results). No matter how we measure performance, we find that funds in high-*SID* families outperform funds in low-*SID* families. The difference is statistically significant at the 5% level, at least, and highly relevant from an economic point of view. The performance difference is 31 bp, 47 bp, and 55 bp per year based on the Jensen (1968) 1-factor model, the Fama and French (1993) 3-factor model, and the Carhart (1997) 4-factor model, respectively.

In a more formal test, we employ a pooled regression in which we relate fund performance in quarter *t* to the speed of information measure, *SID*, of the corresponding fund family in quarter *t-1* and add control variables at the fund and family level:

$$Perf_{i,t} = \alpha + \beta\ SID_{i,t-1} + \gamma' X_{i,t-1} + \varepsilon_{i,t} \qquad (3)$$

We measure fund performance (*Perf*) as described above. $X_{i,t-1}$ is a vector of control variables at the fund and family level, which might have an impact on fund performance. At the fund level, we control for the logarithm of fund's total net assets, the logarithm of the fund's age, and the fund's annual turnover ratio. At the family level, we include the logarithm of the fund family's total net assets under management and the logarithm of the number of distinct investment objectives. In addition, we account for the level of information production at the family level, the idea being that families with relatively more information production might also have faster information dissemination. The corresponding control variable is computed as the quarterly fraction of stocks in the family portfolio that are newly introduced into the family relative to the number of stocks the family held at the previous report date. Finally, we control for the tendency of affiliated funds to trade together. Our measure of correlated trading is constructed as follows: First, for each stock that was traded by the funds of a given family in a given quarter, we calculate a stock-level herding measure as in Lakonishok, Shleifer, and Vishny (1992) but focus only on the trades of all family funds over that quarter. Second, this stock-level herding measure is aggregated at the fund level.[18] Finally, the resulting fund-specific herding measures are aggregated to come up with a herding measure at the family level. To control for any unobservable time or style specific effects, we add time and style fixed effects in the multivariate analyses. Standard errors are clustered at the fund level.

Table 3 reports the results for the regression (3) as well as for a modified version in which we replace the continuous *SID* measure with a *SID* dummy that equals one if the *SID* value of the family is above the median in quarter *t*.

– Insert TABLE 3 approximately here –

The results in Table 3 support the view that fast internal information dissemination is beneficial for fund performance. This is consistent with the resulting benefits from timely information flows in the form of higher information precision outweighing the associated costs likely to appear in the form of free-riding distortions. For both, the continuous *SID* measure and the *SID* dummy, we find that higher speed of information diffusion is positively related to fund performance. The effect is also economically relevant: After controlling for fund and family characteristics, funds from families with above median *SID* outperform funds from families with below median *SID* by up to 16 basis points per quarter, corresponding to an annual outperformance of 64 basis points.

The coefficients on the control variables suggest that fund size has a negative impact on fund performance, which is consistent with the Berk and Green (2004) argument of diseconomies of scale in the mutual fund industry. Fund age has a positive impact on fund performance. The impact of family size on performance is positive (and thus consistent with

[18] Following Wei, Wermers, and Yao (2014), conditional on whether a stock is subject to buy or sell herding, we sort stocks into quintiles. Next, to come up with a fund-specific measure, we trade-weight stocks' quintile scores across all the trades undertaken by a given fund.

e.g., Chen et al. (2004) and Pollet and Wilson (2008)). The remaining controls have no notable or consistent impact on performance.

2.2 Alternative explanations and identification exercises

A possible concern is that our *SID* measure might capture other factors, which could lead to a spurious relation between speed of information diffusion and performance. We address this concern in Section 2.2.1. Second, to address potential reverse causality, we use an identification strategy in Section 2.2.2 that exploits a quasi-natural experiment.

2.2.1 Alternative explanations

One possibility is that our *SID* measure reflects a form of cross-subsidization, whereby certain (high-value) funds within the family are treated favorably at the cost of other (low-value) funds (see, e.g., Eisele, Nefedova, and Parise (2014) and Gaspar, Massa, and Matos (2006)). More specifically, low-*SID* families could be families where hot IPOs are allocated to high-value funds first and the remaining or low-value funds are allowed to buy shares later. More generally, in these families the best trading ideas could be given to the high-value funds first and to the remaining or low-value funds later.[19] If low-*SID* families are families where a great deal of cross-subsidization is going on, that could mean that these families are subject to severe agency problems that can potentially lead to underperformance for most of the family funds.

To alleviate this concern, we introduce two separate modifications to the construction of *SID*. First, we eliminate information intervals that start less than six months after the stocks' IPOs[20], as the allocation of underpriced of IPOs is shown to be one potential channel of

[19] See Cici, Gibson, and Moussawi (2010) for a discussion of this particular mechanism and related mechanisms through which fund families can engage in cross-subsidization.

[20] Data on IPOs are obtained from Jay Ritter's website (https://site.warrington.ufl.edu/ritter/ipo-data/) and Compustat.

favoritism (see, e.g., Gaspar, Massa, and Matos (2006)).[21] Second, we require that at least one low-value fund is buying the stock at the beginning of the information interval. If no low-value fund is trading in the beginning, then we do not consider this event. Similar to Gaspar, Massa, and Matos (2006), we define low-value funds either as funds with a year-to-date style-adjusted return in the bottom quartile within the family, as funds in the top age quartile, or as funds with total fees in the bottom quartile.[22] We estimate the same baseline regression as in Table 3 using each of these restrictions separately in the aggregation of the *SID* measure.

Table 4 reports the results. For sake of brevity, we only report results based on Carhart (1997) alphas, but we obtain qualitatively similar results when using Jensen (1968) or Fama-French (1993) alphas. The first two columns report results when eliminating IPOs, while the six last columns present results when defining low-value funds based on past performance, total fees, or fund age, respectively.

– Insert TABLE 4 approximately here –

The results in Table 4 show that our main result still holds if we take cross-subsidization considerations into account. Irrespective of whether we eliminate the first six months after recent IPOs or exclude information intervals without at least one low-value fund trading at the beginning of the interval, we still document an outperformance of funds in families with higher *SID*.

[21] Another potential mechanism for cross-subsidization is cross-trading. In unreported tests, we calculate the correlation of *SID* with several measures of cross-trading constructed similar to Chuprinin, Massa, and Schumacher (2015). The measures are constructed at the fund level and then averaged to obtain a family-level cross-trading proxy. We find that there is little correlation ranging from 0.8 to 3.2 percent with our *SID* measure. Furthermore, the positive sign of the correlations suggests that our measure of the speed of information diffusion does not capture cross-trading. Our measure would capture cross-trading only if low-*SID* families exhibited higher cross-trading, which is not the case.

[22] Total fees are calculated as expense ratio plus one-seventh of total loads (front- plus rear-load).

Besides cross-subsidization, another concern is that unobservable family characteristics might drive our results.[23] To rule this out, we employ a placebo test that examines the relation between *SID* and the performance of a placebo control group consisting of index funds. The rationale is that index funds make no information-related trades. Thus, speed of information dissemination within their corresponding families should have no impact on their performance.

We take this idea to the data by adding 128 index funds (offered by sample families) to our original sample of actively managed mutual funds[24] and conducting a similar analysis as before. However, we now analyze the performance effect of *SID* separately for actively-managed funds and index funds by interacting *SID* with two binary variables capturing the fund type, actively-managed fund or index fund. *Active* equals one if the fund is an actively-managed fund and zero otherwise. *Index* equals one if the fund is an index funds and zero otherwise. The results from this test are reported in Table 5.

– Insert TABLE 5 approximately here –

Table 5 results show that speed of information diffusion is significantly related to the performance of the actively-managed fund but not to the performance of index funds. This supports the view that our *SID* measure indeed captures the speed of information flows within the fund family and does not reflect unobserved family characteristic that could affect performance.

[23] One could also argue that high-*SID* families are subject to more centralized decision making in that central decision makers simply enforce faster information dissemination, causing all family funds to trade at the same time. Kacperczyk and Seru (2012) find that centralized decision making has a negative effect on fund performance. Thus, if *SID* reflects centralized decision making, it should be negatively related to fund performance. However, this is not the case as *SID* is instead positively related to fund performance, which rules out that our main effect is driven by centralized decision making.

[24] To identify index funds, we require that the fund name (at any point in time) suggests that the fund is an index fund and that the fund is labeled by CRSP as a pure index fund or ETF/ETN. We further require that the fund holds 80% of its portfolio in common stocks on average. We do not consider enhanced index funds or index-based funds, since these still have an active component.

2.2.2 Does an exogenous shock to *SID* affect fund performance?

A natural concern with our results is endogeneity. Good performance of member funds could provide more resources to further strengthen investment processes, enabling investment in structures that facilitate faster information dissemination. To address this possibility, we exploit instances when funds switched families as a result of family mergers and acquisitions that happened for exogenous reasons. Similar to Ferreira, Matos, and Pires (2015), we identify exogenous fund switches that happened after the onset of the recent financial crisis when many bank-holding companies divested some or all their asset management divisions (non-core divisions) to improve their capital ratios.[25] These divestitures likely happened for reasons other than past fund performance and are therefore likely to be exogenous. We expect the induced increase (decrease) in the speed of information diffusion for the funds that switched families to lead to an increase (decrease) in fund performance after the family switch.

We identify 53 instances in our sample when a fund affiliated with a bank-holding company is taken over by another fund family. We run both a simple difference approach as well as a Difference-in-Differences approach against a matched sample that includes funds that are not affected by these divestiture events in the respective period. Using a propensity score matching approach, we identify for each switching fund (treatment group) a control fund that has similar characteristics in the four quarters before the event quarter. To calculate the propensity score, we use the average quarterly values of all control variables of (3) and average quarterly performance based on a 4-factor alpha as regressors as well as style fixed effects. Each fund in the treatment group is matched to the fund with the closest propensity score in the same period (nearest neighbor).[26]

[25] A key difference between our paper and Ferreira, Matos, and Pires (2015) is that their fund sample includes funds that are domiciled outside of the U.S as well as domestic funds, while our paper includes only domestic funds.

[26] We allow only for control funds whose distance in propensity score from the treated fund is not larger than 0.25 times the standard deviation of propensity scores in the treatment group.

We then calculate for each switching fund the post-minus-pre-switch values for each of the performance measures and for the *SID* measure, using the four quarters before and after the event quarter. Similar calculations are performed for the control funds. For the Difference-in-Differences approach, we calculate the difference between the two resulting differences of treated fund and its control fund. Table 6 reports results. Panel A show results without benchmarking the performance and *SID* changes against those of the control fund. In Panel B, we report results based on the Difference-in-Differences approach.

– Insert TABLE 6 approximately here –

The results in Table 6 suggest a positive and significant relation between the (unadjusted and control-adjusted) performance changes and (unadjusted and control-adjusted) *SID* changes. This evidence provides further support for our main hypothesis. Most importantly, these results suggest that the documented shocks to the speed of information diffusion bring about changes in fund performance in the expected direction, strengthening the causal interpretation of the relation between speed of information diffusion and fund performance within the family.

3 Information flows across managers from different versus same styles

In this section we test the hypothesis that fast information flows among managers from the same investment style provide a weaker performance effect than fast information flows among managers from different styles. This is based on two separate arguments. First, managers from the same style have similar skills and employ similar investment analyses and techniques. Thus, no matter how fast information flows across managers from the same style, the precision of their information is unlikely to change by much. Second, when information travels quickly among managers from the same style, they have more opportunities to free-ride on each other's efforts since they potentially can invest in the same stocks from their shared universe. This would cause managers to exert less effort into increasing their information precision. On the contrary, fast information transfers across managers from different styles are likely to increase managers' information precision due to the complementarity of the managers' skills and investment universes. Furthermore, these managers have fewer opportunities to free-ride on each other's efforts because of the lower overlap in their investment universes.

To measure the speed of information diffusion within a style, we modify our *SID* measure to include only the sequence of fund trades of affiliated managers from the same style. We then average the resulting *ID* measures across all styles, to obtain a family level measure, which we refer to as SID_{Within}. To measure speed of information diffusion across styles, we aggregate the holdings of all funds from each style to come up with an aggregate portfolio for each style and modify our measure to include the sequence of trades across the aggregate portfolios of all styles. We refer to this modified measure as SID_{Across}.

We modify our pooled regression (3) by replacing the general diffusion measure, *SID*, with these new measures. Table 7 presents results.

– Insert TABLE 7 approximately here –

Table 7 results show that speed of information diffusion across styles has a positive and significant effect on fund performance, while speed of information diffusion within styles has no impact. Furthermore, as reported in the last row, the performance effect of the cross-style measure is significantly stronger than the performance effect of the within-style measure. This is consistent with fast information diffusion facilitating aggregation of complementary insights and analyses, which sharpens information precision and decision making by managers. The evidence from Table 7 is also consistent with managers from different styles having fewer opportunities to free-ride on each other's efforts in the presence of fast information diffusion among them.

4 How do managers exploit higher information precision?

Finally, we examine how managers from families with higher SID_{Across} exploit the advantage that comes from increased information precision. We focus on SID_{Across} because fast information diffusion across managers from different styles is the primary channel through which performance is affected. We test three hypotheses. First, we expect these managers to trade more in order to take advantage of their higher information precision. Second, their higher information precision is expected to reduce their reliance on public information. Finally, we would expect these managers—due to the unique advantages that come from more precise information—to hold portfolios that are different from the portfolios of their unaffiliated peer funds, i.e., funds following the same style but belonging to other fund families.

In order to conduct the corresponding tests, we need to measure the fund activities that are hypothesized to be affected. For the first hypothesis, we calculate the quarterly turnover ratio of the common stock portfolio using the MF Holdings database (*Portfolio Turnover*). We calculate this measure as the minimum of the dollar value of purchases and sales in a given quarter divided by the average of the total portfolio value at the beginning and end of the quarter.[27] We annualize it by multiplying it with four. For the second hypothesis, we follow Kacperczyk and Seru (2007) and calculate a fund's reliance on public information (*RPI*) as the R^2 from a fund-level regression of changes in the number of shares held in a given stock on lagged changes in mean analyst recommendations.[28] For the final hypothesis, we construct an average peer overlap measure for a given fund (*Peer Overlap*), computed as the value-weighted fraction of funds from the unaffiliated peer group that hold each stock currently held by the given fund. The empirical predictions from the three hypotheses are that funds from higher SID_{Across} families exhibit higher *Portfolio Turnover*, lower *RPI*, and lower *Peer Overlap*.

---

[27] We calculate portfolio turnover only if the time span between two reports, from which we infer stock trades, is one quarter. To mitigate a possible impact of outliers, we winsorize the turnover measure at the 1st and 99th percentiles.

[28] We obtain mean analyst recommendations for a given stock from the IBES database.

We estimate pooled regressions where the dependent variables are *Portfolio Turnover*, *RPI*, and *Peer Overlap* in quarter *t*, respectively. The key independent variable is SID_{Across} in quarter *t-1*. As before, we control for various characteristics, include time and style fixed effects, and cluster standard errors at the fund level. We again use the continuous version of our measure as well as a dummy variable version, where the dummy variable equals one if the SID_{Across} of a given family is above the median in the respective period. Regression results are presented in Table 8.

– Insert TABLE 8 approximately here –

Results from Table 8 support all three hypotheses. Columns 1 and 2 show that funds in high-SID_{Across} families trade more. The effect is highly significant in a statistical sense (significant at the 1%-level) and in economic terms. The turnover ratio of such funds is more than ten percentage points per year larger than the turnover of funds from families with low speed of information diffusion across styles.

Columns 3 and 4 of Table 8 provide support for our hypothesis that managers from high-SID_{Across} families rely less on public information embedded in changes of analyst recommendations. This is consistent with these managers having more precise private information that reduces their need to rely on public information. For both the continuous measure and the high-SID_{Across} dummy, we find that the negative impact on *RPI* is statistically significant at the 1%-level. The economic effect is again notable: Funds from high-SID_{Across} families rely about 0.4 percentage points less on public information than funds from low-SID_{Across} families. This is remarkably high given that the low-SID_{Across} families have an average *RPI* of 6.5 percent.

The last two columns of Table 8 support our hypothesis that managers from high-SID_{Across} families hold portfolios that are less similar to portfolios of their unaffiliated peer group. This is consistent with higher information precision applicable to a broader universe of stocks providing a manager with unique investment ideas outside or at the periphery of her own style-define stock universe, causing her to invest differently from her unaffiliated peers. As with the previous results, this effect is statistically significant at the 1%-level and economically significant with an overlap that is about 0.7 percentage points smaller. Compared to the average overlap of low-SID_{Across} families (18.5 percent) this represents a difference of about four percent.

Taken together, results from this section suggest that fund managers endowed with higher information precision due to the faster dissemination of information within their respective families exploit this advantage in a highly rational manner. These managers trade more to take advantage of their more precise information, rely less on externally-generated information because they can instead utilize internally-generated information that is of relatively higher precision, and pursue investments that deviate from those of their peers simply because their more precise information provides them with unique insights.

5 Robustness checks

We finally investigate whether our main result from Table 3 is robust to variations in our empirical setup. Section 5.1 provides results using alternative approaches to construct our *SID* measure. In Section 5.2, we test temporal stability of our findings, and present further robustness checks in Section 5.3.

5.1 Modifications in the construction of the *SID* measure

In this section, we introduce alternative approaches for measuring speed of information diffusion. The first approach incorporates both initiating buys and terminating sales in the computation of *SID*. Results based on this approach are reported in the first two columns of Table 9. The second approach adopts an alternative way of capturing introduction of new information into the family. Information events are identified when at least one fund starts placing an active bet on a stock. We then track whether other funds in the family place active bets on the stock simultaneously or later. An active bet is defined as a position with portfolio weight either above the mean portfolio weight of all funds or above the mean weight of all funds in the same investment objective in the same quarter. Results based on this approach are reported in the last four columns of Table 9. In the interest of brevity, here and in the rest of this section, we only report results based on Carhart (1997) alphas, but results are similar when using Jensen (1968) or Fama and French (1993) alphas.

– Insert TABLE 9 approximately here –

The results in Table 9 confirm robustness with respect to how we measure speed of information diffusion. Regardless of whether we add terminating sales or focus on active bets, funds in families with higher *SID* outperform funds in families with lower *SID*.

5.2 Subperiod robustness

To assess whether our results are stable over time, we rerun our analysis separately for subperiods of equal length, that is, for Q2/2004-Q1/2008 and Q2/2008-Q1/2012.

– Insert TABLE 10 approximately here –

Results reported in Table 10 show that the documented performance effect of *SID* is stable over time. The effect is similar both in economic and statistical significance in both subperiods.

5.3 Further robustness checks

We conduct further robustness tests reported in Table 11. For brevity, we only report results for Carhart (1997) alpha again and suppress control variables. In Panel A we test robustness with respect to how performance is measured. We use net returns instead of gross returns and use 12 (36) months periods to estimate factor loadings. In Panel B, we modify the approach of aggregating the stock-specific information diffusion measures of (1) by aggregating over 1, 2 or 8 quarters, respectively. Moreover, we alter the minimum number of family funds needed for a family to be included in our sample to three or ten. Finally, we remove stocks from the lowest or highest capitalization terciles at the beginning of the information event before aggregating the stock-level measures. This addresses the concern that our result is driven by large or small capitalization stocks being overrepresented in the information events within the family portfolio.

– Insert TABLE 11 approximately here –

All robustness checks in Table 11 support the finding that higher speed of information diffusion within fund families is beneficial for fund performance. From this and the previous two sections, we can therefore conclude that our main result is robust to different estimation and measurement approaches.

6 Summary and conclusion

In this paper we study how the speed with which information travels within a mutual fund family affects the performance of its member funds. The directional impact on performance is ex-ante unclear because speedy internal dissemination of information can have a twofold effect. On one hand, it can help individual fund managers increase precision of their information by giving them fast access to information generated by all members of the organization. On the other hand, it could provide incentives for some managers to free-ride on the efforts of other affiliated managers and exert less effort.

Employing an intuitive measure to quantify the speed of information diffusion within mutual fund families that traces the sequence of mutual fund trades in response to newly-introduced information in the family, we document that mutual funds benefit from significantly better performance when information is transmitted faster within their corresponding families. Furthermore, our tests based on an exogenous shock to the information environment of mutual funds suggest a causal interpretation of the link between speed of information diffusion and fund performance.

We document that fast dissemination of information has a greater impact on fund performance when information flows across managers from different styles rather than across managers from same styles. This is consistent with fast information diffusion facilitating aggregation of complementary insights, which sharpens information precision and decision making by managers, but is also consistent with there being fewer free-riding opportunities among managers from different styles.

As expected, managers from families where information travels quickly across different styles appear to exploit the resulting advantage associated with increased information precisions in a rational manner, by trading more, relying less on public information, and investing differently from their peers.

Taken altogether, our performance results have implications for the organizational structure of mutual fund families. They suggest that mutual fund families could benefit the performance of their member funds by removing formal or informal barriers that slow down information transfers across their portfolio managers, especially among those investing in different market segments.

REFERENCES

Alchian, A., and H. Demsetz. 1972. Production, Information Costs, and Economic Organization. *The American Economic Review* 62: 777-95.

Alexander, G. J., G. Cici, and S. Gibson. 2007. Does Motivation Matter When Assessing Trade Performance? An Analysis of Mutual Funds. *Review of Financial Studies* 20: 125-50.

Becker, G. S., and K. M. Murphy. 1992. The Division of Labor, Coordination Costs, and Knowledge. *The Quarterly Journal of Economics* 107: 1137-60.

Berk, J. B., and R. C. Green. 2004. Mutual Fund Flows and Performance in Rational Markets. *Journal of Political Economy* 112: 1269-95.

Bonatti, A., and J. Hörner. 2011. Collaborating. *American Economic Review* 101: 632-63.

Cabrera, Á., and E. F. Cabrera. 2002. Knowledge-sharing Dilemmas. *Organization Studies* 23: 687-710.

Carhart, M. M. 1997. On Persistence in Mutual Fund Performance. *Journal of Finance* 52: 57-82.

Chen, H.-L., N. Jegadeesh, and R. Wermers. 2000. The Value of Active Mutual Fund Management: An Examination of the Stockholdings and Trades of Fund Managers. *Journal of Financial and Quantitative Analysis* 25: 343-68.

Chen, J., H. Hong, M. Huang, and J. D. Kubik. 2004. Does Fund Size Erode Mutual Fund Performance? The Role of Liquidity and Organization. *American Economic Review* 94: 1276-302.

Chuprinin, O., M. Massa, and D. Schumacher. 2015. Outsourcing in the International Mutual Fund Industry: An Equilibrium View. *Journal of Finance,* forthcoming.

Cici, G. 2012. The Prevalence of the Disposition Effect in Mutual Funds' Trades. *Journal of Financial and Quantitative Analysis* 47: 795-820.

Cici, G., L. K. Dahm, and A. Kempf. 2014. Trading Efficiency of Fund Families: Impact on Fund Performance and Investment Behavior. Working Paper.

Cici, G., S. Gibson, and R. Moussawi. 2010. Mutual Fund Performance when Parent Firms Simultaneously Manage Hedge Funds. *Journal of Financial Intermediation* 19: 169-97.

Columbia Threadneedle Investments. 2015. Columbia Global Equity Value Fund - Statement of Additional Information. URL: http://columbiamanagement.rightprospectus.com/Fund.aspx?cu=19766F878&dt=S.

Eisele, A., T. Nefedova, and G. Parise. 2014. Are Star Funds really Shining? Cross-trading and Performance Shifting in Mutual Fund Families. Working Paper.

Evans, R. B. 2010. Mutual Fund Incubation. *Journal of Finance* 65: 1581-611.

Fama, E. F., and K. R. French. 1993. Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics* 33: 3-56.

Fang, J., A. Kempf, and M. Trapp. 2014. Fund Manager Allocation. *Journal of Financial Economics* 111: 661-74.

Feldman, A. 2015. Can Third Avenue Get Back on Track? Barron's, URL: http://online.barrons.com/articles/can-third-avenue-get-back-on-track-1431136270.

Ferreira, M. A., P. Matos, and P. Pires. 2015. Asset Management Within Commercial Banking Groups: International Evidence. Working Paper.

Frazzini, A. 2006. The Disposition Effect and Underreaction to News. *Journal of Finance* 61: 2017-46.

Gaspar, J.-M., M. Massa, and P. Matos. 2006. Favoritism in Mutual Fund Families? Evidence on Strategic Cross-Fund Subsidization. *Journal of Finance* 61: 73-104.

Goncalves-Pinto, L., and B. Schmidt. 2013. Co-Insurance in Mutual Fund Families. Working Paper.

Goodman, B. 2012. Best Bond Funds. Barron's, URL: http://online.barrons.com/articles/SB500014240531119034318045775027001063430 44.
Gupta, A. K., and V. Govindarajan. 1986. Resource Sharing among SBUs: Strategic Antecedents and Administrative Implications. *Academy of Management Journal* 29: 695-714.
Hamilton, B., J. A. Nickerson, and H. Owan. 2003. Team Incentives and Worker Heterogeneity: An Empirical Analysis of the Impact of Teams on Productivity and Participation. *Journal of Political Economy* 111: 465-97.
Hansen, M. T. 2002. Knowledge Networks: Explaining Effective Knowledge Sharing in Multiunit Companies. *Organization Science* 13: 232-48.
Hartzmark, S. M. 2015. The Worst, the Best, Ignoring All the Rest: The Rank Effect and Trading Behavior. *Review of Financial Studies* 28: 1024-59.
Holmstrom, B. 1982. Moral Hazard in Teams. *The Bell Journal of Economics* 13: 324-40.
Jensen, M. C. 1968. The Performance of Mutual Funds in the Period 1945-1964. *Journal of Finance* 23: 389-416.
Jin, L., and A. Scherbina. 2011. Inheriting Losers. *Review of Financial Studies* 24: 786-820.
Kacperczyk, M., and A. Seru. 2007. Fund Manager Use of Public Information: New Evidence on Managerial Skills. *Journal of Finance* 62: 485-528.
———. 2012. Does Firm Organization Matter? Evidence from Centralized and Decentralized Mutual Funds. Working Paper.
Lakonishok, J., A. Shleifer, and R.W. Vishny. 1992. The Impact of Institutional Trading on Stock Prices. *Journal of Financial Economics* 32: 23-43.
Legros, P., and S. A. Matthews. 1993. Efficient and Nearly-Efficient Partnerships. *Review of Economic Studies* 68: 599-611.
Ma, C.-T., J. Moore, and S. Turnbull. 1988. Stopping Agents from "Cheating". *Journal of Economic Theory* 46: 355-72.
Milgrom, P., and N. Stokey. 1982. Information, Trade and Common Knowledge. *Journal of Economic Theory* 26: 17-27.
Nanda, V., Z. J. Wang, and L. Zheng. 2004. Family Values and the Star Phenomenon: Strategies of Mutual Fund Families. *Review of Financial Studies* 17: 667-98.
Olson, M. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.
Ozsoylev, H. N., J. Walden, M. D. Yavuz, and R. Bildik. 2014. Investor Networks in the Stock Market. *Review of Financial Studies* 27: 1323-66.
Pollet, J. M., and M. Wilson. 2008. How Does Size Affect Mutual Fund Behavior. *Journal of Finance* 63: 2941-69.
Pool, V. K., N. Stoffman, and S. E. Yonker. 2013. The People in Your Neighborhood: Social Interactions and Mutual Fund Portfolios. *Journal of Finance,* forthcoming.
Radner, R., R. Myerson, and E. Maskin. 1986. An Example of a Repeated Partnership Game with Discounting and with Uniformly Inefficient Equilibria. *Review of Economic Studies* 53: 59-69.
Stein, J. C. 2008. Conversations among Competitors. *American Economic Review* 98: 2150-62.
Strausz, R. 1999. Efficiency in Sequential Partnerships. *Journal of Economic Theory* 85: 140-56.
Tsai, W. 2001. Knowledge Transfer in Intraorganizational Networks: Effects of Network Position and Absorptive Capacity on Business Unit Innovation and Performance. *Academy of Management Journal* 44: 996-1004.
Tsai, W., and S. Ghoshal. 1998. Social Capital and Value Creation: The Role of Intrafirm Networks. *Academy of Management Journal* 41: 464-76.

Wei, K. D., R. Wermers, and T. Yao. 2014. Uncommon Value: The Characteristics and Investment Performance of Contrarian Funds. *Management Science,* forthcoming.
Williams, S. R., and R. Radner. 1994. Efficiency in Partnership When the Joint Output is Uncertain. In: J. Ledyard (ed.). *The Economics of Informational Decentralization: Complexity, Efficiency, and Stability*: 79-99. Boston, MA, Kluwer.
Winter, E. 2004. Incentives and Discrimination. *American Economic Review* 94: 764-73.

Table 1 – Summary statistics

This table reports summary statistics. All observations are measured on a quarterly basis. In Panel A we report summary statistics for the *SID* measure, while in Panel B we present summary statistics for key variables at the family and fund level for the total sample (All) as well as for high- and low-*SID* families. *Family size* is the total net assets under management of the fund family in millions of dollars. *Number of funds* represents the number of funds within a fund family and *Number of objectives* is the number of distinct investment objectives (CRSP Style Codes) followed by all family funds. *Fund size* is the total net assets under management in millions of dollars and *fund age* is shown in years. *Turnover ratio* is fund turnover, defined as the minimum of security purchases and sales divided by the average total net assets under management during the calendar year. *Expense ratio* represents funds' fees charged for total services. The last column of the table reports the difference in fund family and fund characteristics between high- and low-*SID* families. ***, **, * denote statistical significance for the difference in means between both groups at the 1%, 5%, and 10% significance level, respectively.

Panel A: Speed of information diffusion within sample fund families

	Mean	Std.	0.25	0.5	0.75	Serial correlation
SID	0.39	0.18	0.26	0.37	0.51	0.94

Panel B: Sample characteristics

	All	High *SID*	Low *SID*	Difference
Family characteristics:				
Family size	18,498	18,889	18,113	776
Number of funds	11.42	12.64	10.21	2.43 ***
Number of objectives	4.00	4.06	3.94	0.12 ***
Fund characteristics:				
Fund size	1,711	1,585	1,861	-276 ***
Fund age	16.12	16.22	15.99	0.23
Turnover ratio (%)	86.82	95.36	76.66	18.70 ***
Expense ratio (%)	1.20	1.20	1.20	0.00

Table 2 – Speed of information diffusion and information barriers

This table presents results from pooled OLS regressions that analyze the impact of different family characteristics on a fund family's speed of information diffusion. The dependent variable is the speed of information diffusion (SID) measure for the fund family in a given quarter. Our main independent variables are outsourcing ratio, number of managers, and interconnectedness. *Outsourcing ratio* is the fraction of funds in the family that are outsourced to subadvisors. *Number of managers* represents the logarithm of the number of distinct managers within the family. *Interconnectedness* is the density of the manager network, calculated as the number of actual connections between two managers divided by the number of potential connections within the family. A connection between two managers exists if they manage at least one fund together. Additional independent controls include the family size, the number of funds in the family, and the number of investment objectives. *Family size* is the logarithm of total net assets under management of the fund family in millions of dollars. *Number of funds* represents the logarithm of the number of funds in the fund family. N*umber of objectives* is the logarithm of the number of distinct investment objectives (CRSP Style Codes) followed by all the family funds. All independent variables are lagged by one quarter. Regressions are run with time fixed effects. p-values reported in parentheses are based on standard errors clustered by fund family. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Dependent variable:	*SID*	*SID*	*SID*	*SID*
Outsourcing ratio	-0.1078 ***			-0.0730 **
	(0.0019)			(0.0492)
Number of managers		-0.0565 ***		-0.0422 **
		(0.0019)		(0.0230)
Interconnectedness			0.1369 **	0.0972 *
			(0.0150)	(0.0883)
Family size	-0.0177 *	-0.0100	-0.0103	-0.0112
	(0.0676)	(0.2552)	(0.2917)	(0.2177)
Number of funds	0.1005 ***	0.1340 ***	0.0942 ***	0.1305 ***
	(0.0002)	(0.0000)	(0.0011)	(0.0000)
Number of objectives	-0.0607	-0.0377	-0.0161	-0.0179
	(0.2942)	(0.4873)	(0.7845)	(0.7575)
Time fixed effects	Yes	Yes	Yes	Yes
Number of Observations	3,129	3,113	3,075	3,075
Adj. R-Squared	0.0662	0.0631	0.0459	0.0935

Table 3 – Speed of information diffusion and mutual fund performance

This table presents results from pooled OLS regressions of mutual fund performance on lagged speed of information diffusion using three different performance measures: Jensen (1968) 1-factor alpha, Fama-French (1993) 3-factor alpha, and Carhart (1997) 4-factor alpha. Results are reported based on gross-of-fee returns. The main independent variable is the speed of information diffusion (*SID*) measured at the family level. We run separate regressions for the continuous variable as well as the S*ID* dummy that equals one if the fund family's S*ID* is above the median in a given quarter. Additional independent controls include fund size, fund age, turnover ratio, family size, the fraction of new stocks in the family portfolio, and a measure of correlated trading within the fund family. *Fund size* represents the logarithm of the fund's total net assets under management (measured in millions of dollars). *Fund age* is the logarithm of the fund's age (measured in years). *Turnover ratio* is the fund's yearly turnover ratio, defined as the minimum of security purchases and sales divided by the average total net assets under management during the calendar year. *Family size* is the logarithm of the fund family's assets under management (measured in millions of dollars). *Information production* is the number of distinct stocks that are newly purchased in the family relative to the number of stocks in the family at the previous report date. *Correlated trading* represents the average contrarian index of the funds within a family following the calculation in Wei, Wermers, and Yao (2014), but based only on the trades within the fund family. All independent variables are valid as of the end of the quarter preceding the fund performance calculation. Regressions are run with quarter and style fixed effects. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Fund performance					
Dependent variable:	Jensen alpha		Fama-French alpha		Carhart alpha	
SID	0.0807		0.2278 **		0.3271 ***	
	(0.4710)		(0.0324)		(0.0016)	
High *SID*		0.0840 **		0.1504 ***		0.1643 ***
		(0.0165)		(0.0000)		(0.0000)
Fund size	-0.0535 ***	-0.0533 ***	-0.0418 ***	-0.0418 ***	-0.0414 ***	-0.0417 ***
	(0.0001)	(0.0001)	(0.0007)	(0.0007)	(0.0008)	(0.0007)
Fund age	0.1857 ***	0.1858 ***	0.1496 ***	0.1498 ***	0.1751 ***	0.1751 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Turnover ratio	0.0344	0.0282	-0.0150	-0.0222	0.0022	-0.0021
	(0.2284)	(0.3227)	(0.5867)	(0.4177)	(0.9336)	(0.9350)
Family size	0.0395 ***	0.0367 ***	0.0334 **	0.0302 **	0.0293 **	0.0278 **
	(0.0041)	(0.0071)	(0.0161)	(0.0271)	(0.0326)	(0.0399)
Number of objectives	-0.0200	-0.0337	-0.0899	-0.1098	-0.0576	-0.0748
	(0.8125)	(0.6881)	(0.2747)	(0.1808)	(0.4683)	(0.3442)
Information production	0.1006	0.0924	-0.0366	-0.0421	-0.0882	-0.0858
	(0.2472)	(0.2862)	(0.6809)	(0.6338)	(0.3077)	(0.3205)
Correlated trading	-0.1251 ***	-0.1171 ***	-0.0806	-0.0711	-0.0750	-0.0693
	(0.0020)	(0.0037)	(0.1186)	(0.1651)	(0.1069)	(0.1355)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	32,657	32,657	32,657	32,657	32,657	32,657
Adj. R-Squared	0.1379	0.1380	0.1089	0.1093	0.0916	0.0920

Table 4 – Speed of information diffusion and mutual fund performance after eliminating cross-subsidization considerations

This table presents results from pooled OLS regressions of mutual fund performance on lagged speed of information diffusion. Fund performance is measured using the Carhart (1997) 4-factor alpha. Results are reported based on gross-of-fee returns. In the first two columns, the main independent variable is the speed of information diffusion (*SID*), modified to eliminate all information intervals that start in less than six months after the stocks' initial public offerings (IPOs). In the last six columns, *SID* is modified to include only information intervals where at least one low-value fund is buying the stock at the beginning of the interval. A low-value fund is defined as a fund in the bottom quartile of style-adjusted year-to-date fund returns in its family (columns 3 and 4), as a fund in the bottom quartile of total fund fees (expense ratio + 1/7 of total loads) in its family (columns 5 and 6), and as a fund in the top age quartile in its family (columns 7 and 8). We run separate regressions for the continuous variable as well as the S*ID* dummy that equals one if the fund family's S*ID* is above the median in a given quarter. Additional independent controls are as in Table 3. All independent variables are valid as of the end of the quarter preceding the fund performance calculation. The multivariate regressions are run with quarter and style fixed effects. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

			Low-value fund definition based on:					
	6 Months after IPOs		Past performance		Total fees		Fund age	
Dependent variable:	Carhart alpha		Carhart alpha		Carhart alpha		Carhart alpha	
SID	0.3080 ***		0.2850 ***		0.2058 ***		0.2691 ***	
	(0.0029)		(0.0004)		(0.0051)		(0.0006)	
High *SID*		0.1693 ***		0.1275 ***		0.0858 ***		0.1085 ***
		(0.0000)		(0.0000)		(0.0064)		(0.0008)
Fund size	-0.0414 ***	-0.0416 ***	-0.0414 ***	-0.0423 ***	-0.0431 ***	-0.0434 ***	-0.0421 ***	-0.0428 ***
	(0.0008)	(0.0007)	(0.0008)	(0.0006)	(0.0005)	(0.0005)	(0.0007)	(0.0005)
Fund age	0.1751 ***	0.1749 ***	0.1748 ***	0.1757 ***	0.1732 ***	0.1738 ***	0.1739 ***	0.1757 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Turnover ratio	0.0027	-0.0032	0.0071	0.0057	0.0116	0.0130	0.0098	0.0114
	(0.9178)	(0.9029)	(0.7886)	(0.8276)	(0.6625)	(0.6249)	(0.7130)	(0.6695)
Family size	0.0305 **	0.0281 **	0.0322 **	0.0328 **	0.0290 **	0.0298 **	0.0356 ***	0.0353 **
	(0.0259)	(0.0368)	(0.0159)	(0.0137)	(0.0348)	(0.0288)	(0.0096)	(0.0107)
Number of objectives	-0.0579	-0.0762	-0.0383	-0.0430	-0.0538	-0.0519	-0.0786	-0.0707
	(0.4660)	(0.3355)	(0.6241)	(0.5819)	(0.4725)	(0.4875)	(0.3254)	(0.3785)
Information production	-0.0889	-0.0876	-0.0727	-0.0731	-0.0081	-0.0022	-0.0773	-0.0674
	(0.3048)	(0.3105)	(0.3990)	(0.3973)	(0.9221)	(0.9784)	(0.3822)	(0.4442)
Correlated trading	-0.0765 *	-0.0695	-0.0817 *	-0.0894 **	-0.1008 **	-0.1034 **	-0.0892 *	-0.0939 **
	(0.1000)	(0.1331)	(0.0617)	(0.0395)	(0.0211)	(0.0175)	(0.0594)	(0.0476)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	32,654	32,654	32,438	32,438	32,102	32,102	31,767	31,767
Adj. R-Squared	0.0916	0.0921	0.0918	0.0920	0.0915	0.0915	0.0922	0.0921

Table 5 – Speed of information diffusion and the performance of active and index funds

This table presents results from pooled OLS regressions of mutual fund performance on lagged speed of information diffusion using three different performance measures: Jensen (1968) 1-factor alpha, Fama-French (1993) 3-factor alpha, and Carhart (1997) 4-factor alpha. Results are reported based on gross-of-fee returns. The main independent variable is the speed of information diffusion (S*ID*) measure for the fund family. We run separate regressions for the continuous variable as well as the *SID* dummy that equals one if the fund family's *SID* is above the median in a given quarter. We analyze the slope of the *SID* measures using two binary variables Active and Index. Active equals one if a fund is defined as actively-managed and zero otherwise. In contrast, Index equals one if the fund is an index fund and zero otherwise. Additional independent controls are as in Table 3. All independent variables are valid as of the end of the quarter preceding the fund performance calculation. Regressions are run with quarter and style fixed effects. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Table 5 – Speed of information diffusion and the performance of active and index funds (continued)

	Fund performance					
Dependent variable:	Jensen alpha		Fama-French alpha		Carhart alpha	
*SID**Active	0.0900		0.2400 **		0.3411 ***	
	(0.4200)		(0.0231)		(0.0009)	
*SID**Index	0.0081		-0.0789		-0.0078	
	(0.9734)		(0.6285)		(0.9602)	
High *SID**Active		0.0861 **		0.1516 ***		0.1668 ***
		(0.0137)		(0.0000)		(0.0000)
High *SID**Index		0.0206		0.0469		0.0665
		(0.8349)		(0.4312)		(0.2487)
Index	-0.0952	-0.0101	-0.0938	0.1598 ***	-0.1366	0.1350 **
	(0.6009)	(0.8808)	(0.4518)	(0.0019)	(0.2537)	(0.0111)
Fund size	-0.0541 ***	-0.0538 ***	-0.0397 ***	-0.0393 ***	-0.0396 ***	-0.0395 ***
	(0.0000)	(0.0000)	(0.0006)	(0.0007)	(0.0006)	(0.0006)
Fund age	0.1840 ***	0.1839 ***	0.1453 ***	0.1448 ***	0.1712 ***	0.1706 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Turnover ratio	0.0235	0.0182	-0.0019	-0.0076	0.0109	0.0075
	(0.3312)	(0.4488)	(0.9335)	(0.7295)	(0.6123)	(0.7240)
Family size	0.0385 ***	0.0358 ***	0.0285 **	0.0257 **	0.0244 *	0.0231 *
	(0.0034)	(0.0057)	(0.0284)	(0.0456)	(0.0585)	(0.0696)
Number of objectives	-0.0182	-0.0313	-0.1140	-0.1325 *	-0.0761	-0.0927
	(0.8193)	(0.6943)	(0.1384)	(0.0843)	(0.3054)	(0.2113)
Information production	0.0951	0.0874	-0.0404	-0.0457	-0.0868	-0.0843
	(0.2584)	(0.2978)	(0.6392)	(0.5944)	(0.2994)	(0.3132)
Correlated trading	-0.1129 ***	-0.1056 ***	-0.0456	-0.0371	-0.0335	-0.0286
	(0.0037)	(0.0064)	(0.3290)	(0.4236)	(0.4319)	(0.5018)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	35,122	35,122	35,122	35,122	35,122	35,122
Adj. R-Squared	0.1316	0.1317	0.1041	0.1045	0.0871	0.0876

Table 6 – Performance effect around changes in family affiliation

This table relates changes in performance with changes in *SID* around family-switching events. We focus on events after the onset of the financial crisis (2007 or later), when a fund is taken over by another family due to divestitures by bank-holding companies. We compute the post-minus-pre-switch performance as well as the post-minus-pre-switch *SID* using four quarters of data before and after the event quarter. In Panel A, we report results using unadjusted changes in *SID* and performance while in Panel B, we report results using peer-adjusted changes in performance and *SID*. The dependent variable is the (unadjusted or peer-adjusted) post-minus-pre-switch performance. Fund performance is measured using the Jensen (1968) 1-factor alpha, Fama-French (1993) 3-factor alpha, and Carhart (1997) 4-factor alpha. Results are based on gross-of-fee returns. The key independent variable is the (unadjusted or peer-adjusted) post-minus-pre-switch *SID*. For the peer-adjustment, we additionally compute a post- minus-pre-switch performance and post-minus-pre-switch *SID* for a matched control fund that is not affected by the event. For both fund performance and *SID*, we subtract the difference of the control fund from the difference for the fund in the treatment group. The control fund for each fund in the treatment group fulfills a propensity score matching on a vector of average quarterly values of 4-factor alpha, fund size, fund turnover, family size, the number of investment objectives within the family, information production and correlated trading, as well as fund age and style, all measured before the family-switching quarter. We match exactly on the time-period. Additional independent controls include fund age as well as post-minus-pre-switch values for fund size, turnover ratio, family size, number of investment objectives, information production, and correlated trading. The variables are defined as in Table 3. All control variables are measured for the funds in the treatment group using quarterly values in the 4 quarters before and after the family-switching quarter, respectively. The multivariate regressions are run with style fixed effects. p-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Panel A: Without peer-adjustment

	Changes in fund performance (unadjusted)					
Dependent variable:	Δ Jensen		Δ Fama-French		Δ Carhart	
Δ *SID*	6.0578 ***	5.1248 *	4.7245 ***	6.7121 ***	1.8315 **	3.3364 **
	(0.0031)	(0.0901)	(0.0065)	(0.0055)	(0.0458)	(0.0191)
Δ Fund size		0.4024		0.4596		0.1718
		(0.4417)		(0.2591)		(0.4777)
Fund age		0.1408		0.3315		0.1157
		(0.7991)		(0.4410)		(0.6516)
Δ Turnover ratio		1.1580		0.3302		0.0807
		(0.2064)		(0.6391)		(0.8476)
Δ Family size		-0.6120		-0.9487 ***		-0.2641
		(0.1154)		(0.0026)		(0.1414)
Δ Number of objectives		-0.4486		0.4943		-0.3747
		(0.8161)		(0.7411)		(0.6750)
Δ Information production		3.7805		-3.7177		-4.0805
		(0.5988)		(0.5049)		(0.2235)
Δ Correlated trading		0.1971		1.0157		0.5073
		(0.8681)		(0.2731)		(0.3582)
Style fixed effects	No	Yes	No	Yes	No	Yes
Number of Observations	53	53	53	53	53	53
Adj.R-Squared	0.1425	0.1768	0.1193	0.3032	0.0578	0.0787

Table 6 – Performance effect around changes in family affiliation (continued)

Panel B: With peer-adjustment (nearest neighbor)

	Changes in fund performance (peer-adjusted)					
Dependent variable:	Diff.-in-Diff. Jensen		Diff.-in-Diff. Fama-French		Diff.-in-Diff. Carhart	
Diff.-in-Diff. SID	5.5603 **	2.3910	5.0061 ***	4.1370 **	2.6747 *	4.0433 ***
	(0.0112)	(0.3332)	(0.0047)	(0.0230)	(0.0522)	(0.0035)
Δ Fund size		0.3111		0.5603		0.1189
		(0.6329)		(0.2333)		(0.7322)
Fund age		0.2051		0.3049		0.2301
		(0.7590)		(0.5249)		(0.5198)
Δ Turnover ratio		1.7399		0.7280		0.0713
		(0.1258)		(0.3664)		(0.9051)
Δ Family size		-0.4652		-1.0029 ***		-0.6152 **
		(0.3117)		(0.0037)		(0.0152)
Δ Number of objectives		-2.4898		1.5168		2.3147 *
		(0.2919)		(0.3690)		(0.0703)
Δ Information production		6.0897		1.7411		-7.7726 *
		(0.4548)		(0.7647)		(0.0788)
Δ Correlated trading		-2.0190		-0.0735		1.0818
		(0.1158)		(0.9352)		(0.1145)
Style fixed effects	No	Yes	No	Yes	No	Yes
Number of Observations	53	53	53	53	53	53
Adj.R-Squared	0.1023	0.2691	0.1297	0.4338	0.0537	0.4588

Table 7 – Speed of information diffusion within and across investment styles

This table presents results from pooled OLS regressions of mutual fund performance on lagged speed of information diffusion using three different performance measures: Jensen (1968) 1-factor alpha, Fama-French (1993) 3-factor alpha, and Carhart (1997) 4-factor alpha. Results are based on gross-of-fee returns. Our main independent variables are SID_{Across} and SID_{Within}. SID_{Across} is based on buy decisions made by funds across different investment objectives. SID_{Within} is based on buy decisions by funds within the same investment objective in the fund family. We run separate regressions for the continuous variable as well as the high-*SID* dummy that equals one if the fund family's *SID* is above the median in a given quarter. Additional independent controls are as in Table 3. All independent variables are valid as of the end of the quarter preceding the fund performance calculation. Regressions are run with quarter and style fixed effects. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Table 7 – Speed of information diffusion within and across objectives (continued)

	Fund performance					
Dependent variable:	Jensen alpha		Fama-French alpha		Carhart alpha	
SID_{Across}	0.2044 *		0.2669 **		0.3569 ***	
	(0.0857)		(0.0168)		(0.0008)	
SID_{Within}	-0.0463		0.0360		0.0350	
	(0.6087)		(0.6855)		(0.6734)	
High SID_{Across}		0.1283 ***		0.1371 ***		0.1283 ***
		(0.0003)		(0.0000)		(0.0001)
High SID_{Within}		0.0054		0.0190		0.0376
		(0.8806)		(0.5906)		(0.2702)
Fund size	-0.0538 ***	-0.0541 ***	-0.0430 ***	-0.0437 ***	-0.0435 ***	-0.0436 ***
	(0.0001)	(0.0001)	(0.0005)	(0.0004)	(0.0004)	(0.0004)
Fund age	0.1885 ***	0.1885 ***	0.1509 ***	0.1505 ***	0.1781 ***	0.1776 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Turnover ratio	0.0363	0.0275	-0.0171	-0.0223	0.0014	-0.0014
	(0.2067)	(0.3396)	(0.5386)	(0.4223)	(0.9580)	(0.9581)
Family size	0.0391 ***	0.0342 **	0.0341 **	0.0309 **	0.0324 **	0.0295 **
	(0.0051)	(0.0141)	(0.0166)	(0.0294)	(0.0202)	(0.0341)
Number of objectives	-0.0347	-0.0406	-0.1004	-0.1027	-0.0738	-0.0687
	(0.6844)	(0.6315)	(0.2265)	(0.2200)	(0.3575)	(0.3963)
Information production	0.0943	0.0793	0.0083	0.0014	-0.0343	-0.0389
	(0.2893)	(0.3707)	(0.9259)	(0.9871)	(0.6883)	(0.6488)
Correlated trading	-0.1168 ***	-0.1063 **	-0.0659	-0.0613	-0.0641	-0.0648
	(0.0055)	(0.0110)	(0.2069)	(0.2371)	(0.1768)	(0.1693)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
H0: SID_{Within} >= SID_{Across}	-0.2507 *		-0.2309 *		-0.3219 **	
H0: High SID_{Within} >= High SID_{Across}		-0.1229 **		-0.1181 **		-0.0907 **
Number of Observations	32,281	32,281	32,281	32,281	32,281	32,281
Adj. R-Squared	0.1388	0.1390	0.1090	0.1094	0.0916	0.0917

Table 8 – Speed of information diffusion and fund behavior

This table presents results from pooled OLS regressions that analyze the impact of lagged speed of information diffusion on a fund's behavior. *Quarterly turnover* is the minimum of the dollar value of purchases and sales in a given quarter divided by the average of the total portfolio value at the beginning and end of the quarter, defined as in Carhart (1997). *Reliance on public information* is the R^2 of the regression of changes in a fund's portfolio holdings on lagged changes in mean analyst recommendations, as described in Kacperczyk and Seru (2007). Average peer overlap is the value-weighted fraction of peer funds holding the same stock. SID_{Across} is described in Table 6. Additional independent controls are as in Table 3. All independent variables are valid at the beginning of the period, for which we calculate turnover, reliance on public information, and the average peer overlap. Regressions are run with time (year or quarter, respectively) and style fixed effects. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	Fund behavior					
Dependent variable:	Quarterly turnover (annualized)		Reliance on public information		Average peer overlap	
SID_{Across}	0.3510 ***		-0.0133 ***		-0.0259 ***	
	(0.0000)		(0.0051)		(0.0004)	
High SID_{Across}		0.1021 ***		-0.0037 ***		-0.0066 ***
		(0.0000)		(0.0070)		(0.0010)
Fund size	-0.0486 ***	-0.0492 ***	-0.0015 **	-0.0014 **	0.0026 ***	0.0027 ***
	(0.0000)	(0.0000)	(0.0317)	(0.0344)	(0.0087)	(0.0075)
Fund age	0.0613 ***	0.0615 ***	0.0001	0.0001	0.0026	0.0026
	(0.0000)	(0.0000)	(0.9428)	(0.9436)	(0.3117)	(0.3146)
Family size	0.0047	0.0046	-0.0064 ***	-0.0064 ***	-0.0020 *	-0.0021 *
	(0.4613)	(0.4678)	(0.0000)	(0.0000)	(0.0600)	(0.0559)
Number of objectives	0.0527	0.0621 *	0.0081 **	0.0076 *	0.0069	0.0060
	(0.1090)	(0.0630)	(0.0465)	(0.0603)	(0.3044)	(0.3768)
Information production	0.0519 ***	0.0518 ***	0.0002	0.0002	0.0071 ***	0.0071 ***
	(0.0061)	(0.0070)	(0.9489)	(0.9505)	(0.0079)	(0.0088)
Correlated trading	0.0289 **	0.0218 *	-0.0010	-0.0007	0.0003	0.0009
	(0.0140)	(0.0690)	(0.6822)	(0.7765)	(0.9279)	(0.7705)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	28,351	28,351	30,098	30,098	30,281	30,281
Adj. R-Squared	0.0851	0.0815	0.0599	0.0596	0.5962	0.5954

Table 9 – Modifications in the construction of *SID*

This table presents results from pooled OLS regressions of mutual fund performance on lagged speed of information diffusion. Fund performance is measured using the Carhart (1997) 4-factor alpha. Results are reported based on gross-of-fee returns. In the first two columns, the main independent variable is the speed of information diffusion (*SID*), modified to pool all information events of initiating purchases and terminating sales. In the last four columns, *SID* is based on active bets placed within the family. An active bet is defined as a stock position with a portfolio weight that is larger than the mean portfolio weight of all funds in the same quarter (columns 3 and 4) or larger than the mean portfolio weight of all funds in the same investment style (columns 5 and 6). We run separate regressions for the continuous variable as well as the S*ID* dummy that equals one if the fund family's S*ID* is above the median in a given quarter. Additional independent controls are as in Table 3. All independent variables are valid as of the end of the quarter preceding the fund performance calculation. The multivariate regressions are run with quarter and style fixed effects. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

	SID based on buys and sells		*SID* based on active bets relative to mean portfolio weight of all funds		*SID* based on active bets relative to mean portfolio weight of all funds in same style	
Dependent variable:	Carhart alpha		Carhart alpha		Carhart alpha	
SID	0.2850 **		0.2527 **		0.2301 **	
	(0.0154)		(0.0120)		(0.0297)	
High *SID*		0.1255 ***		0.1205 ***		0.1309 ***
		(0.0001)		(0.0002)		(0.0001)
Fund size	-0.0427 ***	-0.0427 ***	-0.0426 ***	-0.0427 ***	-0.0421 ***	-0.0421 ***
	(0.0006)	(0.0005)	(0.0006)	(0.0005)	(0.0007)	(0.0006)
Fund age	0.1774 ***	0.1783 ***	0.1775 ***	0.1779 ***	0.1765 ***	0.1769 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Turnover ratio	0.0073	0.0032	0.0046	0.0025	0.0057	0.0013
	(0.7822)	(0.9016)	(0.8612)	(0.9244)	(0.8301)	(0.9625)
Family size	0.0340 **	0.0297 **	0.0295 **	0.0290 **	0.0298 **	0.0266 *
	(0.0118)	(0.0288)	(0.0317)	(0.0315)	(0.0305)	(0.0506)
Number of objectives	-0.0445	-0.0526	-0.0408	-0.0528	-0.0431	-0.0558
	(0.5711)	(0.5026)	(0.6028)	(0.5026)	(0.5849)	(0.4810)
Information production	-0.0751	-0.0828	-0.0842	-0.0764	-0.0815	-0.0828
	(0.3843)	(0.3376)	(0.3285)	(0.3751)	(0.3438)	(0.3357)
Correlated trading	-0.0784 *	-0.0764 *	-0.0788 *	-0.0791 *	-0.0808 *	-0.0765 *
	(0.0935)	(0.0991)	(0.0896)	(0.0862)	(0.0810)	(0.0980)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	32,681	32,681	32,679	32,679	32,663	32,663
Adj. R-Squared	0.0914	0.0917	0.0914	0.0916	0.0914	0.0917

Table 10 – Speed of information diffusion and mutual fund performance – Subperiod analysis

This table replicates Table 3, separately for two subperiods. The first two columns present results for the first half of the sample period (Q2/2004-Q1/2008) while the last two columns report the results for the second half (Q2/2008-Q1/2012) p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively

	Q2/2004-Q1/2008		Q2/2008-Q1/2012	
Dependent variable:	Carhart alpha		Carhart alpha	
SID	0.2998 **		0.3237 **	
	(0.0157)		(0.0436)	
High *SID*		0.1299 ***		0.1899 ***
		(0.0010)		(0.0001)
Fund size	-0.0560 ***	-0.0562 ***	-0.0278	-0.0282
	(0.0004)	(0.0004)	(0.1053)	(0.1003)
Fund age	0.1189 ***	0.1186 ***	0.2347 ***	0.2348 ***
	(0.0008)	(0.0009)	(0.0000)	(0.0000)
Turnover ratio	0.0425	0.0422	-0.0339	-0.0427
	(0.2624)	(0.2613)	(0.3484)	(0.2368)
Family size	0.0594 ***	0.0588 ***	0.0055	0.0027
	(0.0004)	(0.0004)	(0.7803)	(0.8862)
Number of objectives	-0.2370 **	-0.2476 ***	0.1014	0.0760
	(0.0129)	(0.0095)	(0.3707)	(0.4992)
Information production	0.0190	0.0224	-0.1868	-0.1859
	(0.8517)	(0.8254)	(0.1681)	(0.1674)
Correlated trading	-0.1158 **	-0.1146 **	-0.0477	-0.0390
	(0.0249)	(0.0282)	(0.4536)	(0.5372)
Time fixed effects	Yes	Yes	Yes	Yes
Style fixed effects	Yes	Yes	Yes	Yes
Number of Observations	15,856	15,856	16,801	16,801
Adj. R-Squared	0.0752	0.0755	0.0980	0.0985

Table 11 – Further robustness checks

This table presents robustness checks for the baseline regression of Table 3. For brevity, we only report coefficients of interest and suppress control variables. Fund performance is measured using the Carhart (1997) 4-factor alpha. If not indicated otherwise, results are reported based on gross-of-fee returns. The main independent variables are the speed of information diffusion (*SID*) or the *SID* dummy, defined as in Table 3. In Panel A, we vary the performance measurement. In particular, we use net instead of gross-of-fee returns. We also use 12 (36) months as estimation window for the factor loadings. In Panel B, we report different approaches to aggregate the stock-level information diffusion measure to the family-level *SID* measure. We aggregate the stock-specific measures over 1, 2 or 8 quarters. We set the minimum number of funds within the family to be equal to three or 10. Finally, we eliminate stocks from the largest (smallest) market capitalization from the aggregation. p-values reported in parentheses are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 1%, 5%, and 10% significance level, respectively.

Panel A: Performance measurement

	SID	High *SID*	
Dependent variable:	Carhart alpha		Number of observations
Use net returns	0.3339 ***	0.1606 ***	32,657
	(0.0012)	(0.0000)	
12 months for factor loading estimation	0.2232 *	0.1273 ***	33,447
	(0.0693)	(0.0012)	
36 months for factor loading estimation	0.3181 ***	0.1447 ***	31,347
	(0.0019)	(0.0000)	

Panel B: Alternative aggregation approach

	SID	High *SID*	
Dependent variable:	Carhart alpha		Number of observations
Aggregate over 1 quarter	0.2696 ***	0.1144 ***	32,416
	(0.0035)	(0.0004)	
Aggregate over 2 quarters	0.2700 ***	0.1258 ***	32,638
	(0.0054)	(0.0001)	
Aggregate over 8 quarters	0.3215 ***	0.1273 ***	32,662
	(0.0031)	(0.0001)	
Minimum 3 funds in family	0.2034 **	0.1389 ***	38,089
	(0.0184)	(0.0000)	
Minimum 10 funds in family	0.3500 ***	0.1530 ***	22,480
	(0.0056)	(0.0001)	
Eliminate largest stock tercile	0.1673 ***	0.0781 **	30,180
	(0.0078)	(0.0175)	
Eliminate smallest stock tercile	0.3583 ***	0.1421 ***	32,657
	(0.0005)	(0.0000)	

cfr working paper series

CFR Working Papers are available for download from **www.cfr-cologne.de.**

Hardcopies can be ordered from: Centre for Financial Research (CFR), Albertus Magnus Platz, 50923 Koeln, Germany.

2015

No.	Author(s)	Title
15-04	A. Kempf, D. Mayston, M. Gehde-Trapp, P. K. Yadav	Resiliency: A Dynamic View of Liquidity
15-03	V. Agarwal, Y. E. Arisoy, N. Y. Naik	Volatility of Aggregate volatility and Hedge Funds Returns
15-02	G. Cici, S. Jaspersen, A. Kempf	Speed of Information Diffusion within Fund Families
15-01	M. Baltzer, S. Jank, E. Smajlbegovic	Who trades on momentum?

2014

No.	Author(s)	Title
14-14	G. Cici, L. K. Dahm, A. Kempf	Trading Efficiency of Fund Families: Impact on Fund Performance and Investment Behavior
14-13	V. Agarwal, Y. Lu, S. Ray	Under one roof: A study of simultaneously managed hedge funds and funds of hedge funds
14-12	P. Limbach, F. Sonnenburg	CEO Fitness and Firm Value
14-11	G. Cici, M. Gehde-Trapp, M. Göricke, A. Kempf	What They Did in their Previous Life: The Investment Value of Mutual Fund Managers' Experience outside the Financial Sector
14-10	O. Korn, P. Krischak, E. Theissen	Illiquidity Transmission from Spot to Futures Markets
14-09	E. Theissen, L. S. Zehnder	Estimation of Trading Costs: Trade Indicator Models Revisited
14-08	C. Fink, E. Theissen	Dividend Taxation and DAX Futures Prices
14-07	F. Brinkmann, O. Korn	Risk-adjusted Option-implied Moments
14-06	J. Grammig, J. Sönksen	Consumption-Based Asset Pricing with Rare Disaster Risk

14-05	J. Grammig, E. Schaub	Give me strong moments and time – Combining GMM and SMM to estimate long-run risk asset pricing
14-04	C. Sorhage	Outsourcing of Mutual Funds' Non-core Competencies
14-03	D. Hess, P. Immenkötter	How Much Is Too Much? Debt Capacity And Financial Flexibility
14-02	C. Andres, M. Doumet, E. Fernau, E. Theissen	The Lintner model revisited: Dividends versus total payouts
14-01	N.F. Carline, S. C. Linn, P. K. Yadav	Corporate Governance and the Nature of Takeover Resistance

2013

No.	Author(s)	Title
13-11	R. Baule, O. Korn, S. Saßning	Which Beta is Best? On the Information Content of Option-implied Betas
13-10	V. Agarwal, L. Ma	Managerial Multitasking in the Mutual Fund Industry
13-09	M. J. Kamstra, L.A. Kramer, M.D. Levi, R. Wermers	Seasonal Asset Allocation: Evidence from Mutual Fund Flows
13-08	F. Brinkmann, A. Kempf, O. Korn	Forward-Looking Measures of Higher-Order Dependencies with an Application to Portfolio Selection
13-07	G. Cici, S. Gibson, Y. Gunduz, J.J. Merrick, Jr.	Market Transparency and the Marking Precision of Bond Mutual Fund Managers
13-06	S. Bethke, A. Kempf, M. Trapp	Investor Sentiment, Flight-to-Quality, and Corporate Bond Comovement
13-05	P. Schuster, M. Trapp, M. Uhrig-Homburg	A Heterogeneous Agents Equilibrium Model for the Term Structure of Bond Market Liquidity
13-04	V. Agarwal, K. Mullally, Y. Tang, B. Yang	Mandatory Portfolio Disclosure, Stock Liquidity, and Mutual Fund Performance
13-03	V. Agarwal, V. Nanda, S.Ray	Institutional Investment and Intermediation in the Hedge Fund Industry
13-02	C. Andres, A. Betzer, M. Doumet, E. Theissen	Open Market Share Repurchases in Germany: A Conditional Event Study Approach
13-01	J. Gaul, E. Theissen	A Partially Linear Approach to Modelling the Dynamics of Spot and Futures Price

2012

No.	Author(s)	Title
12-12	Y. Gündüz, J. Nasev, M. Trapp	The Price Impact of CDS Trading
12-11	Y. Wu, R. Wermers, J. Zechner	Governance and Shareholder Value in Delegated Portfolio Management: The Case of Closed-End Funds

12-10	M. Trapp, C. Wewel	Transatlantic Systemic Risk
12-09	G. Cici, A. Kempf, C. Sorhage	Do Financial Advisors Provide Tangible Benefits for Investors? Evidence from Tax-Motivated Mutual Fund Flows
12-08	S. Jank	Changes in the composition of publicly traded firms: Implications for the dividend-price ratio and return predictability
12-07	G. Cici, C. Rosenfeld	The Investment Abilities of Mutual Fund Buy-Side Analysts
12-06	A. Kempf, A. Pütz, F. Sonnenburg	Fund Manager Duality: Impact on Performance and Investment Behavior
12-05	R. Wermers	Runs on Money Market Mutual Funds
12-04	R. Wermers	A matter of style: The causes and consequences of style drift in institutional portfolios
12-02	C. Andres, E. Fernau, E. Theissen	Should I Stay or Should I Go? Former CEOs as Monitors
12-01	L. Andreu, A. Pütz	Are Two Business Degrees Better Than One? Evidence from Mutual Fund Managers' Education

2011

No.	Author(s)	Title
11-16	V. Agarwal, J.-P. Gómez, R. Priestley	Management Compensation and Market Timing under Portfolio Constraints
11-15	T. Dimpfl, S. Jank	Can Internet Search Queries Help to Predict Stock Market Volatility?
11-14	P. Gomber, U. Schweickert, E. Theissen	Liquidity Dynamics in an Electronic Open Limit Order Book: An Event Study Approach
11-13	D. Hess, S. Orbe	Irrationality or Efficiency of Macroeconomic Survey Forecasts? Implications from the Anchoring Bias Test
11-12	D. Hess, P. Immenkötter	Optimal Leverage, its Benefits, and the Business Cycle
11-11	N. Heinrichs, D. Hess, C. Homburg, M. Lorenz, S. Sievers	Extended Dividend, Cash Flow and Residual Income Valuation Models – Accounting for Deviations from Ideal Conditions
11-10	A. Kempf, O. Korn, S. Saßning	Portfolio Optimization using Forward - Looking Information
11-09	V. Agarwal, S. Ray	Determinants and Implications of Fee Changes in the Hedge Fund Industry
11-08	G. Cici, L.-F. Palacios	On the Use of Options by Mutual Funds: Do They Know What They Are Doing?
11-07	V. Agarwal, G. D. Gay, L. Ling	Performance inconsistency in mutual funds: An investigation of window-dressing behavior
11-06	N. Hautsch, D. Hess, D. Veredas	The Impact of Macroeconomic News on Quote Adjustments, Noise, and Informational Volatility
11-05	G. Cici	The Prevalence of the Disposition Effect in Mutual Funds' Trades

11-04	S. Jank	Mutual Fund Flows, Expected Returns and the Real Economy
11-03	G.Fellner, E.Theissen	Short Sale Constraints, Divergence of Opinion and Asset Value: Evidence from the Laboratory
11-02	S.Jank	Are There Disadvantaged Clienteles in Mutual Funds?
11-01	V. Agarwal, C. Meneghetti	The Role of Hedge Funds as Primary Lenders

2010

No.	Author(s)	Title
10-20	G. Cici, S. Gibson, J.J. Merrick Jr.	Missing the Marks? Dispersion in Corporate Bond Valuations Across Mutual Funds
10-19	J. Hengelbrock, E. Theissen, C. Westheide	Market Response to Investor Sentiment
10-18	G. Cici, S. Gibson	The Performance of Corporate-Bond Mutual Funds: Evidence Based on Security-Level Holdings
10-17	D. Hess, D. Kreutzmann, O. Pucker	Projected Earnings Accuracy and the Profitability of Stock Recommendations
10-16	S. Jank, M. Wedow	Sturm und Drang in Money Market Funds: When Money Market Funds Cease to Be Narrow
10-15	G. Cici, A. Kempf, A. Puetz	The Valuation of Hedge Funds' Equity Positions
10-14	J. Grammig, S. Jank	Creative Destruction and Asset Prices
10-13	S. Jank, M. Wedow	Purchase and Redemption Decisions of Mutual Fund Investors and the Role of Fund Families
10-12	S. Artmann, P. Finter, A. Kempf, S. Koch, E. Theissen	The Cross-Section of German Stock Returns: New Data and New Evidence
10-11	M. Chesney, A. Kempf	The Value of Tradeability
10-10	S. Frey, P. Herbst	The Influence of Buy-side Analysts on Mutual Fund Trading
10-09	V. Agarwal, W. Jiang, Y. Tang, B. Yang	Uncovering Hedge Fund Skill from the Portfolio Holdings They Hide
10-08	V. Agarwal, V. Fos, W. Jiang	Inferring Reporting Biases in Hedge Fund Databases from Hedge Fund Equity Holdings
10-07	V. Agarwal, G. Bakshi, J. Huij	Do Higher-Moment Equity Risks Explain Hedge Fund Returns?
10-06	J. Grammig, F. J. Peter	Tell-Tale Tails: A data driven approach to estimate unique market information shares
10-05	K. Drachter, A. Kempf	Höhe, Struktur und Determinanten der Managervergütung- Eine Analyse der Fondsbranche in Deutschland
10-04	J. Fang, A. Kempf, M. Trapp	Fund Manager Allocation
10-03	P. Finter, A. Niessen-Ruenzi, S. Ruenzi	The Impact of Investor Sentiment on the German Stock Market
10-02	D. Hunter, E. Kandel, S. Kandel, R. Wermers	Mutual Fund Performance Evaluation with Active Peer Benchmarks

10-01	S. Artmann, P. Finter, A. Kempf	Determinants of Expected Stock Returns: Large Sample Evidence from the German Market

2009

No.	Author(s)	Title
09-17	E. Theissen	Price Discovery in Spot and Futures Markets: A Reconsideration
09-16	M. Trapp	Trading the Bond-CDS Basis – The Role of Credit Risk and Liquidity
09-15	A. Betzer, J. Gider, D.Metzger, E. Theissen	Strategic Trading and Trade Reporting by Corporate Insiders
09-14	A. Kempf, O. Korn, M. Uhrig-Homburg	The Term Structure of Illiquidity Premia
09-13	W. Bühler, M. Trapp	Time-Varying Credit Risk and Liquidity Premia in Bond and CDS Markets
09-12	W. Bühler, M. Trapp	Explaining the Bond-CDS Basis – The Role of Credit Risk and Liquidity
09-11	S. J. Taylor, P. K. Yadav, Y. Zhang	Cross-sectional analysis of risk-neutral skewness
09-10	A. Kempf, C. Merkle, A. Niessen-Ruenzi	Low Risk and High Return – Affective Attitudes and Stock Market Expectations
09-09	V. Fotak, V. Raman, P. K. Yadav	Naked Short Selling: The Emperor`s New Clothes?
09-08	F. Bardong, S.M. Bartram, P.K. Yadav	Informed Trading, Information Asymmetry and Pricing of Information Risk: Empirical Evidence from the NYSE
09-07	S. J. Taylor , P. K. Yadav, Y. Zhang	The information content of implied volatilities and model-free volatility expectations: Evidence from options written on individual stocks
09-06	S. Frey, P. Sandas	The Impact of Iceberg Orders in Limit Order Books
09-05	H. Beltran-Lopez, P. Giot, J. Grammig	Commonalities in the Order Book
09-04	J. Fang, S. Ruenzi	Rapid Trading bei deutschen Aktienfonds: Evidenz aus einer großen deutschen Fondsgesellschaft
09-03	A. Banegas, B. Gillen, A. Timmermann, R. Wermers	The Cross-Section of Conditional Mutual Fund Performance in European Stock Markets
09-02	J. Grammig, A. Schrimpf, M. Schuppli	Long-Horizon Consumption Risk and the Cross-Section of Returns: New Tests and International Evidence
09-01	O. Korn, P. Koziol	The Term Structure of Currency Hedge Ratios

2008

No.	Author(s)	Title
08-12	U. Bonenkamp, C. Homburg, A. Kempf	Fundamental Information in Technical Trading Strategies
08-11	O. Korn	Risk Management with Default-risky Forwards

08-10	J. Grammig, F.J. Peter	International Price Discovery in the Presence of Market Microstructure Effects
08-09	C. M. Kuhnen, A. Niessen	Public Opinion and Executive Compensation
08-08	A. Pütz, S. Ruenzi	Overconfidence among Professional Investors: Evidence from Mutual Fund Managers
08-07	P. Osthoff	What matters to SRI investors?
08-06	A. Betzer, E. Theissen	Sooner Or Later: Delays in Trade Reporting by Corporate Insiders
08-05	P. Linge, E. Theissen	Determinanten der Aktionärspräsenz auf Hauptversammlungen deutscher Aktiengesellschaften
08-04	N. Hautsch, D. Hess, C. Müller	Price Adjustment to News with Uncertain Precision
08-03	D. Hess, H. Huang, A. Niessen	How Do Commodity Futures Respond to Macroeconomic News?
08-02	R. Chakrabarti, W. Megginson, P. Yadav	Corporate Governance in India
08-01	C. Andres, E. Theissen	Setting a Fox to Keep the Geese - Does the Comply-or-Explain Principle Work?

2007

No.	Author(s)	Title
07-16	M. Bär, A. Niessen, S. Ruenzi	The Impact of Work Group Diversity on Performance: Large Sample Evidence from the Mutual Fund Industry
07-15	A. Niessen, S. Ruenzi	Political Connectedness and Firm Performance: Evidence From Germany
07-14	O. Korn	Hedging Price Risk when Payment Dates are Uncertain
07-13	A. Kempf, P. Osthoff	SRI Funds: Nomen est Omen
07-12	J. Grammig, E. Theissen, O. Wuensche	Time and Price Impact of a Trade: A Structural Approach
07-11	V. Agarwal, J. R. Kale	On the Relative Performance of Multi-Strategy and Funds of Hedge Funds
07-10	M. Kasch-Haroutounian, E. Theissen	Competition Between Exchanges: Euronext versus Xetra
07-09	V. Agarwal, N. D. Daniel, N. Y. Naik	Do hedge funds manage their reported returns?
07-08	N. C. Brown, K. D. Wei, R. Wermers	Analyst Recommendations, Mutual Fund Herding, and Overreaction in Stock Prices
07-07	A. Betzer, E. Theissen	Insider Trading and Corporate Governance: The Case of Germany
07-06	V. Agarwal, L. Wang	Transaction Costs and Value Premium
07-05	J. Grammig, A. Schrimpf	Asset Pricing with a Reference Level of Consumption: New Evidence from the Cross-Section of Stock Returns
07-04	V. Agarwal, N.M. Boyson, N.Y. Naik	Hedge Funds for retail investors? An examination of hedged mutual funds
07-03	D. Hess, A. Niessen	The Early News Catches the Attention: On the Relative Price Impact of Similar Economic Indicators

07-02	A. Kempf, S. Ruenzi, T. Thiele	Employment Risk, Compensation Incentives and Managerial Risk Taking - Evidence from the Mutual Fund Industry -
07-01	M. Hagemeister, A. Kempf	CAPM und erwartete Renditen: Eine Untersuchung auf Basis der Erwartung von Marktteilnehmern

2006

No.	Author(s)	Title
06-13	S. Čeljo-Hörhager, A. Niessen	How do Self-fulfilling Prophecies affect Financial Ratings? - An experimental study
06-12	R. Wermers, Y. Wu, J. Zechner	Portfolio Performance, Discount Dynamics, and the Turnover of Closed-End Fund Managers
06-11	U. v. Lilienfeld-Toal, S. Ruenzi	Why Managers Hold Shares of Their Firm: An Empirical Analysis
06-10	A. Kempf, P. Osthoff	The Effect of Socially Responsible Investing on Portfolio Performance
06-09	R. Wermers, T. Yao, J. Zhao	Extracting Stock Selection Information from Mutual Fund holdings: An Efficient Aggregation Approach
06-08	M. Hoffmann, B. Kempa	The Poole Analysis in the New Open Economy Macroeconomic Framework
06-07	K. Drachter, A. Kempf, M. Wagner	Decision Processes in German Mutual Fund Companies: Evidence from a Telephone Survey
06-06	J.P. Krahnen, F.A. Schmid, E. Theissen	Investment Performance and Market Share: A Study of the German Mutual Fund Industry
06-05	S. Ber, S. Ruenzi	On the Usability of Synthetic Measures of Mutual Fund Net-Flows
06-04	A. Kempf, D. Mayston	Liquidity Commonality Beyond Best Prices
06-03	O. Korn, C. Koziol	Bond Portfolio Optimization: A Risk-Return Approach
06-02	O. Scaillet, L. Barras, R. Wermers	False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas
06-01	A. Niessen, S. Ruenzi	Sex Matters: Gender Differences in a Professional Setting

2005

No.	Author(s)	Title
05-16	E. Theissen	An Analysis of Private Investors´ Stock Market Return Forecasts
05-15	T. Foucault, S. Moinas, E. Theissen	Does Anonymity Matter in Electronic Limit Order Markets
05-14	R. Kosowski, A. Timmermann, R. Wermers, H. White	Can Mutual Fund „Stars“ Really Pick Stocks? New Evidence from a Bootstrap Analysis
05-13	D. Avramov, R. Wermers	Investing in Mutual Funds when Returns are Predictable
05-12	K. Griese, A. Kempf	Liquiditätsdynamik am deutschen Aktienmarkt

05-11	S. Ber, A. Kempf, S. Ruenzi	Determinanten der Mittelzuflüsse bei deutschen Aktienfonds
05-10	M. Bär, A. Kempf, S. Ruenzi	Is a Team Different From the Sum of Its Parts? Evidence from Mutual Fund Managers
05-09	M. Hoffmann	Saving, Investment and the Net Foreign Asset Position
05-08	S. Ruenzi	Mutual Fund Growth in Standard and Specialist Market Segments
05-07	A. Kempf, S. Ruenzi	Status Quo Bias and the Number of Alternatives - An Empirical Illustration from the Mutual Fund Industry
05-06	J. Grammig, E. Theissen	Is Best Really Better? Internalization of Orders in an Open Limit Order Book
05-05	H. Beltran-Lopez, J. Grammig, A.J. Menkveld	Limit order books and trade informativeness
05-04	M. Hoffmann	Compensating Wages under different Exchange rate Regimes
05-03	M. Hoffmann	Fixed versus Flexible Exchange Rates: Evidence from Developing Countries
05-02	A. Kempf, C. Memmel	Estimating the Global Minimum Variance Portfolio
05-01	S. Frey, J. Grammig	Liquidity supply and adverse selection in a pure limit order book market

2004

No.	Author(s)	Title
04-10	N. Hautsch, D. Hess	Bayesian Learning in Financial Markets – Testing for the Relevance of Information Precision in Price Discovery
04-09	A. Kempf, K. Kreuzberg	Portfolio Disclosure, Portfolio Selection and Mutual Fund Performance Evaluation
04-08	N.F. Carline, S.C. Linn, P.K. Yadav	Operating performance changes associated with corporate mergers and the role of corporate governance
04-07	J.J. Merrick, Jr., N.Y. Naik, P.K. Yadav	Strategic Trading Behaviour and Price Distortion in a Manipulated Market: Anatomy of a Squeeze
04-06	N.Y. Naik, P.K. Yadav	Trading Costs of Public Investors with Obligatory and Voluntary Market-Making: Evidence from Market Reforms
04-05	A. Kempf, S. Ruenzi	Family Matters: Rankings Within Fund Families and Fund Inflows
04-04	V. Agarwal, N.D. Daniel, N.Y. Naik	Role of Managerial Incentives and Discretion in Hedge Fund Performance
04-03	V. Agarwal, W.H. Fung, J.C. Loon, N.Y. Naik	Risk and Return in Convertible Arbitrage: Evidence from the Convertible Bond Market
04-02	A. Kempf, S. Ruenzi	Tournaments in Mutual Fund Families
04-01	I. Chowdhury, M. Hoffmann, A. Schabert	Inflation Dynamics and the Cost Channel of Monetary Transmission

centre for financial research
cfr/university of cologne
albertus-magnus-platz
D-50923 cologne
fon +49(0)221-470-6995
fax +49(0)221-470-3992
kempf@cfr-cologne.de
www.cfr-cologne.de