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Information flows within financial conglomerates: Evidence from the banks–mutual funds relation

Massimo Massa *, Zahid Rehman

INSEAD, Boulevard de Constance, 77300, Fontainebleau, France

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ABSTRACT

We study how information flows within financial conglomerates by analyzing the relations between mutual funds and banks that belong to the same financial group. We investigate the effect that the lending behavior of affiliated banks has on the portfolio choice of the mutual funds that are part of the same group. We show that funds (fund families) increase their stakes in the firms that borrow from their affiliated banks in the period following the deal by far greater amounts than other unaffiliated funds (fund families). We provide evidence that this strategy is information-driven. The performance of the positions of affiliated funds in the stocks of borrowing firms exceeds that of their other positions in nonborrowing stocks located in the same industry as well as that of other stocks having similar characteristics by up to 1.6% per month. Funds increase (decrease) their stock holdings in those borrowing stocks that subsequently provide positive (negative) abnormal returns, suggesting that they exploit privileged inside information not available to other market participants. This behavior is prevalent largely in funds located in close geographic proximity to their lending banks. Furthermore, it is exhibited mostly by young, small, and poorly performing fund families. Our evidence points to information flows within conglomerates through informal channels such as personal acquaintances.

1. Introduction

In recent years, numerous scandals on Wall Street have highlighted the conflict of interests that arises due to rampant sharing of information between different divisions of financial conglomerates. While such information sharing could be considered optimal from the perspective of the conglomerate, it seriously undermines the interests of common investors. Academic research and the financial press have studied the conflict of interest between the analyst and investment banking divisions, as well as relations between underwriting and commercial banks (e.g., Aggarwal, Prabhala, and Puri, 2002; Schenone, 2004; Drucker and Puri, 2005). However, little research has analyzed how financial conglomerates use their mutual funds to exploit the information generated in-house by their lending activities. This is surprising, as lending represents the traditional activity around which banks are organized.

Do the lending divisions of the conglomerate pass on information about the borrowing firms to their affiliated asset managers? How is this information used by the affiliated asset managers and what is its effect on their performance? Is this information private in nature or can other unaffiliated asset managers replicate the trading strategies of these affiliated managers? These are some of the questions we seek to address in this paper by focusing on the affiliation of mutual funds with financial conglomerates that also contain a banking arm. In particular, we analyze how knowledge spillovers regarding borrowing

* Corresponding author. Tel.: +33 16072 4481; fax: +33 16072 4045.
E-mail address: massimo.massa@insead.edu (M. Massa).

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firms influence the investment activities of affiliated mutual funds and what effect this has on their performance.

Traditionally, mutual funds have been considered as stand-alone entities. Recently, the literature has started to consider the implications of family affiliation. However, many mutual funds belong not only to families of funds, but also to broader financial conglomerates that exercise other activities, such as banking and insurance. In the US alone, approximately 40% of the mutual funds between 1990 and 2004 belonged to such financial conglomerates. This implies that the manager of a fund (e.g., ABN Amro Equity Plus Fund) is effectively working for a broader organization (ABN Amro) whose main interests might not be aligned with those of the fund holders.

Affiliation with a financial conglomerate provides mutual funds with access to a broader set of resources, better research facilities, lower transaction costs, and distribution externalities. In the extreme case, the fund manager could even be able to use the inside information acquired from the lending activity of the affiliated bank to select stocks. Knowledge of private trading forecasts, confidential reports, and presentations to bankers' meetings could be an invaluable resource that might help these funds in identifying the right stocks to invest in. A firm taking out a loan generally agrees to provide the lender with certain information, sometimes including monthly financial updates. Investors in a public company's stocks or bonds, by contrast, receive only quarterly reports. If a firm considers whether to refinance debt or secure financing for a merger or acquisition, it could share those intentions with the lenders. Firms with problems threatening to break the terms of the loan have to disclose them to the lenders.

To illustrate how lenders can acquire privileged information regarding a firm's future prospects, we take the recent example of Movie Gallery, a big movie rental chain. "In early March, executives from Movie Gallery held a private conference call for their lenders to talk about how disastrous 2005 had been for the company. A string of Hollywood flops had kept customers away. More people were recording movies from television instead of renting them from a store. The executives said they needed more time to fix the problems, which included more than $1 billion in debt. Most of the roughly 200 lenders were not bankers, but hedge funds. And what they heard was supposed to be confidential: it was inside information, as valuable to investors as a tip about an imminent takeover" (The New York Times, 2006).

Such sharing of information violates the law, and the Securities and Exchange Commission (SEC) has repeatedly tried to enforce it by sanctioning firms doing it. Regulators have tried to prevent this incestuous behavior by establishing limits to the flow of information between different parts of the same financial group; i.e., erecting Chinese walls. However, it is not clear how effective this regulation has been. This debate is now even more relevant given the repeal of the provision preventing commercial banks from directly investing in stocks (Glass Steagall Act). In fact, in the wake of the furor raised by the Movie Gallery insider trading investigation, the Loan Syndications and Trading Association (LSTA) outlined "broad guidelines for the receipt, use and distribution by and to, loan market participants of confidential information that is generally available in the loan market and that may at times include material non-public information". The concern is the potential misuse of nonpublic financial information gathered by lenders from their loan market activities that could be utilized in their securities market activities.

We directly focus on how the investment activity of the mutual funds belonging to a financial conglomerate is related to the lending activity of their affiliated banks and whether these relations help the funds to deliver superior performance. We posit that funds exploit the inside information available to the affiliated bank to construct their portfolios around the time of the occurrence of the deal. We refer to this as the information hypothesis. This is in the same vein as Irvine, Lipson, and Puckett (2004), who find that institutional investors receive tips regarding the content of forthcoming analysts' reports, and as Ritter and Zhang (2007), who show that lead underwriters allocate hot initial public offerings (IPOs) to affiliated funds. We contrast this hypothesis with the possibility that fund managers simply pay more attention to the loan deals that are clinched by their affiliated lending banks and invest more heavily in the stocks of these borrowing firms. We refer to this as the attention hypothesis.

Both hypotheses predict that asset managers who are part of a financial conglomerate rebalance their portfolios ensuing the lending of the affiliated banks. However, their effects on fund returns are different. The information hypothesis predicts the borrowing stocks, in which affiliated funds increase their holdings, to out-perform other holdings of these affiliated funds in nonborrowing stocks located in the same industry at the same time. It also predicts these borrowing stocks to out-perform other stocks with similar characteristics such as stocks matched on industry, size, and market to book ratio. The attention hypothesis does not have implications in terms of better performance. Given that more attention does not imply access to privileged information, borrowing stocks bought by fund managers should not necessarily out-perform other stocks held by these funds.

We test these hypotheses by focusing on all the actively managed US equity funds over the period from January 1993 to June 2004. We test whether affiliation to a group that contains a bank affects the stock holdings of the group's mutual funds in firms that are borrowing from the affiliated bank. We articulate our tests in three phases. First, we examine whether the funds condition their portfolio allocation on the lending deals of their affiliated bank. Second, we distinguish between the information hypothesis and the attention hypothesis by investigating whether the funds' positions in borrowing stocks perform better or worse than their other positions in nonborrowing stocks located in the same industry and whether this portfolio reallocation is driven by inside information. Third, we identify the channel through which the transfer of information occurs.

We find evidence that funds condition their investment activity on the lending decisions of their affiliated

banks. Mutual funds affiliated to lending banks, on average, increase their holdings in the stocks of borrowing firms, around the initiation of the loan deal, by 181% more than the funds that are not affiliated to these groups. The results aggregate at the family level as affiliated fund families increase their holdings in borrowing stocks by 150% more than other unaffiliated fund families. These findings are economically significant and are robust to different testing methodologies.

We then investigate whether the portfolio reallocation is driven by information transfer or just attention. We compare the stock performance of firms that are borrowing from their affiliated bank and in which affiliated funds increase their positions after the deal initiation with the performance of other nonborrowing stocks located in the same industry that are held by these funds at the same time. We find that the risk-adjusted returns from borrowing stocks in which affiliated funds increase their positions are 1.6% per month in excess of the returns from these nonborrowing stocks. This provides evidence suggesting that funds selectively increase their holdings in borrowing stocks likely to do well in the near future that supports the information hypothesis.

Next, we perform a direct test of inside information by analyzing whether the investment strategies of bank-affiliated funds can be replicated by other investors merely by observing the announcement of the loan deal. We show that this is not the case. Not all the borrowing firms generate abnormal returns in the post-deal period. The borrowing firms in which bank affiliated mutual funds increase their holdings in the period after the deal out-perform those borrowing firms in which these funds decrease their stock holdings by up to 1.7% per month. Furthermore, stocks in which funds increase (decrease) their holdings around the deal announcement tend to out-perform (under-perform) their industry counterparts in the period immediately following the completion of the deal.

These findings suggest that knowledge about the existence of the loan by itself is not a sufficient signal about the quality of the borrowing firm and it is only the access to an affiliated bank within the same group that provides the mutual funds with the necessary access to privileged information. These results appear all the more stark when we consider the evidence of Billet, Flannery, and Garfinkel (2006) showing that firms announcing bank loan financing suffer negative abnormal stock returns during the 3-year post-announcement period. However, the sample period of Billet, Flannery, and Garfinkel (2006) is from 1980 to 1989, and it does not overlap with the sample period used in this study.

Lastly, we analyze how the information transfer between the lending and the asset management divisions of the conglomerate takes place. We find that the increase in the holding of borrowing stocks is mostly exhibited by mutual funds located in close geographical proximity to their affiliated banks. This suggests an informal exploitation of bank acquired information by affiliated fund managers perhaps through personal acquaintances. We also take a closer look at the characteristics of the fund families that exhibit such behavior. We find that information flows are more prevalent among young, small, and poorly performing fund families. Overall, while our results point in the direction of significant, but not widespread, use of insider information by individual fund managers, they do not show that the information transfer occurs as a coordinated activity at the family level.

We link to three main strands of literature. The first deals with financial intermediation. We contribute to this literature by showing instances in which functional specialization might not be effective to prevent a flow of information within the financial group. Unlike what has been argued by the financial press, however, we show that the breach of Chinese walls could be beneficial to the mutual fund investors. This implies that the problem is not to protect the mutual fund investors, but to ensure a fair and level playing field in the financial market. Our evidence points more in the direction of insider trading, i.e., situations in which some investors exploit their superior information and trade upon it. This could have negative implications for the firms borrowing from the financial conglomerates as they bear the negative impact of the resulting information asymmetry on their stock's liquidity.

The second strand of literature is related to the economics of mutual fund families. This literature has studied the constraints and benefits that family affiliation imposes upon funds identifying how family strategies condition fund performance, risk taking, and investment (Khorana and Servaes, 1999; Mamaysky and Spiegel, 2002; Nanda, Wang, and Zheng, 2003; Massa, 2003; Gaspar, Massa, and Matos, 2006; Guedj and Papastaikoudi, 2004). We contribute to this literature by broadening the analysis and considering the overall financial organization that the mutual fund family could be part of. We show that the agency problem is not limited to fund activities within the fund family but is relevant as far as the existence of other entities within the same financial group is concerned. Unlike the recent investigations into market timing and late trading, our evidence shows that fund investors could benefit from affiliation with big groups.

Finally, our work relates to the extant literature on firm boundaries (Holmstrom and Roberts, 1998; Mullainathan and Scharfstein, 2001). Our results suggest that information flows are an important determinant of firm boundaries. One of the main reasons for housing commercial banks and mutual funds under the same roof could be to facilitate the transmission of information.

The remainder of the paper is organized as follows. In Section 2, we outline our hypotheses. In Section 3, we describe the data and the construction of the main variables. In Section 4, we provide evidence of the impact of the lending activities of banks on stock holdings of affiliated funds. In Section 5, we study whether the portfolio reallocation is driven by inside information and whether funds' portfolio allocation decisions forecast returns for borrowing stocks. In Section 6, we analyze the means through which the information transfer occurs and Section 7 provides a general discussion. A brief conclusion follows in Section 8.

2. Hypotheses

We start by providing some definitions. We define as affiliated funds all those mutual funds belonging to a fund family that is part of a financial conglomerate involving a lending bank. For example, ABN Amro Funds would be classified as affiliated in case of a loan deal in which a company is borrowing from ABN Amro Bank.[1] To make the identification feasible, we impose the additional requirement that the family should hold the stock of the borrowing firm for at least one quarter (from the 13-F Institutional Investors database) in years −2 to +5 surrounding the initiation of the deal (where 0 represents the year of the deal's initiation). We define as control funds all the mutual funds that are either not affiliated to a group containing a bank or are part of a financial conglomerate affiliated to a nonlending bank. Fidelity Funds would be an example of funds that are not affiliated to any bank. Our main focus is to test whether affiliated funds behave differently in their stock picking activities from control funds and whether the stock picking activities of affiliated funds provide some information about the future performance of the borrowing stocks.

If some relation exists between the investment activities of mutual funds and the lending activities of their affiliated banks, we expect that the changes in holdings of these funds in the stocks of firms borrowing from their affiliated banks would differ systematically from the way control funds change their holdings in these stocks around the time of the deal initiation. The increase in holdings should take place around the time in which the lending deal is being finalized. That is, affiliated funds should have higher stock holdings in the stocks of borrowing firms after the deal initiation date than before it. Moreover, the magnitude of the increase in fund holdings should be more significant in comparison with the increase (if any) exhibited by their respective control funds. This allows us to posit our first hypothesis.

H1. Affiliated funds increase their holdings in the stocks of firms borrowing from their affiliated bank more significantly than their control funds.

The alternative hypothesis is the absence of any relation between the lending and the investment activities of affiliated funds in the stocks of the borrowing firms.

Next, we directly investigate whether the portfolio rebalancing is driven by information or attention. If the increase in holdings in the stocks of borrowing firms is being driven by inside information, then the performance of the stocks in which affiliated funds increase their holdings should be superior to that of other nonborrowing stocks located in the same industry being held by these funds at the same time. It should, moreover, be superior to the performance of other similar stocks (in which similarity is defined in terms of industry, size, and market-to-book ratio) not involved in loan deals as well as those borrowing stocks in which these funds decrease their holdings. In other words, the over-performance generated from the portfolio positions in the stocks of borrowing firms can be justified only in terms of inside information available to the lending arm of the conglomerate. This allows us to posit the following hypothesis.

H2. The borrowing stocks in which the affiliated funds increase their positions after the announcement of the loan deal out-perform other similar stocks as well as the borrowing stocks in which these funds reduce their positions.

This hypothesis is tested against the more generic alternative that fund managers increase their holdings in the borrowing stocks just because they pay more attention to the loan deals that are clinched by the banks to which they are affiliated. Given that more attention on its own does not imply access to inside information, these stocks need not out-perform either the other holdings of affiliated funds in nonborrowing stocks located in the same industry or their similar industry counterparts.

3. Data and construction of main variables

The data are obtained from three sources: Center For Research in Security Prices (CRSP) Mutual Funds Database, for data on mutual fund characteristics; Spectrum Mutual Funds, for data on fund holdings; and the Loan Pricing Corporation (LPC) Dealscan database, for data on lending relations between banks and firms. Dealscan is a comprehensive international data set that contains detailed information relating to the start and expiration dates of loan deals along with the names of the lending banks, loan amounts, terms and conditions of the loans, and their associated costs. Apart from the constraint that the borrowing firm be located in the North American region and that the deal should be confirmed, we use the entire universe of deals reported in Dealscan as long as the ticker symbol for the borrowing corporation is available and the lead bank(s) for the deal can be identified. We merge Dealscan and the other data sets.

We collapse multiple classes of the same fund by taking the TNA (total net assets) weighted average of the individual class characteristics. The TNA of the fund itself is the sum of the TNAs of the individual classes that belong to the fund. Our final data set contains information on the starting date of each loan transaction (known as the deal active date in Dealscan), identities of the borrowing firms and their lead lending banks, and the holdings and characteristics of affiliated funds.

We focus on deals that could signal substantial new information to the mutual funds. We therefore consider only the deals between the borrowing firms and the lead banks involved in the syndicate. The idea is that the lead bank, by virtue of its role in the syndicate, is liable to have more proprietary information about the borrowing firm than the other banks. Furthermore, we impose the criterion that, for a deal to be eligible for consideration

[1] To make the identification feasible, we impose the additional requirement that the family should hold the stock of the borrowing firm for at least one quarter (from the 13-F Institutional Investors database) in years −2 to +5 surrounding the initiation of the deal (where 0 represents the year of the deal's initiation).

in our sample, no other deal between a bank belonging to the same fund family (taken from 13-F Institutional Investors) and the same firm should have taken place in the previous 5 years. We exclude repeat borrowers to identify deals that are likely to generate substantial new information for the lending bank, which helps us to pin down the time of the information transfer that, in turn, enables us to execute our tests effectively. This criterion enables us to avoid issues of long-term relations between firms and banks in which a new deal might not be a signal of new information but could just be a continuation of an existing relation.

Next, we impose the standard criteria that funds must be more than 1-year old and have more than $1 million of assets under management to ensure that we deal with representative funds. Also, to focus exclusively on stock funds, we impose the criteria that 85% of the funds' portfolio must be invested in stocks while not more than 2% should be invested in bonds (this excludes approximately the top 2.5% of funds ranked in terms of bond holdings).

Our main variable of interest is the Change in Fund Holdings. This captures how mutual funds change their stocks holdings in borrowing firms. Given the centrality of this variable for our paper, we measure the holdings of funds in the stocks of borrowing firms in two distinct ways: Fraction1 and Fraction2. Fraction1 refers to the percentage of the outstanding company shares held by a fund, and Fraction2 refers to the percentage of the company shares held by a fund out of all the shares that are being held by all mutual funds at that particular time. Each of these variables is measured over the 6 months before and 6 months after the initiation of the loan deal. Given that mutual funds report their holdings semi-annually or quarterly at best in the Spectrum Mutual Funds database, we essentially have one or two quarters of holdings of each mutual fund in each stock for each deal on either side of the loan initiation date. We, therefore, construct the Change in Fund Holdings by subtracting the average percentage holdings of the funds in the borrowing stocks in the two quarters before the deal from their average percentage holdings in these stocks in the two quarters after the deal. This approach is similar in spirit to the approach that is employed by Ritter and Zhang (2007) that also looks at a six month window in the period following the IPO to check whether an affiliated mutual fund has received an allocation of an IPO or not.

Our choice of the holdings measures has been motivated by our concern to keep the price effects separate from the quantity effects, i.e., we do not want price increases or decreases to drive the change in holdings instead of the change in the actual number of shares. In particular, Fraction1 focuses on the percentage of a firm that is owned by a particular fund. This measure has the advantage of being free of any price effect and immune to stock splits or reverse splits. One potential drawback, however, is the fact that it is easier for funds to change their holdings in smaller stocks more markedly than bigger ones. To overcome this potential problem, we use Fraction2. Given that mutual funds, ceteris paribus, might not own progressively bigger chunks of bigger companies, this measure should correct for any bias related to company size. Moreover, like Fraction1, Fraction2 is immune to price effects and splits or reverse-splits. To clarify, ΔFraction1 (ΔFraction2) is computed by subtracting the average percentage level of ΔFraction1 (ΔFraction2) in the 6 months before the deal from its average percentage level in the 6 months following the deal. Therefore, if, for example, Fraction1 is 0.03 before the deal and 0.07 after the deal, ΔFraction1 would be 0.04. This would denote a 0.04% increase in the holding.

For each loan deal, we identify a set of control funds for each affiliated fund in the following way. We first identify all those funds that are either unaffiliated to banks or are affiliated to nonlending banks (in the case of this particular deal). Then, we select the closest five or ten funds from this pool on the basis of their investment objective, size, total assets under family management, and past fund performance. Only those affiliated funds are included in the sample for which suitable controls can be found. The change in holdings in the stocks of borrowing firms is calculated for both the affiliated funds and their respective control funds. More specifically, conditional on the fact that a fund reports on a given date, if an affiliated or control fund does not report any positive holding in the stocks of borrowing firms (whether before or after the deal), the holding is assigned to zero. This yields 10,931 fund-stock deal observations for affiliated funds for which data are non-missing on each of the key variables used in subsequent analyses. We exclude all financial firms and utilities from our analysis. These observations occur in the window of 6 months before and 6 months after the initiation of the loan deal. Throughout the paper, we report the results using five control funds only. The use of ten control funds delivers consistent results.

We provide detailed definitions of the main variables in the Appendix. Table 1, Panel A contains the summary statistics for these variables as well as the average holdings that affiliated funds have in the stocks of borrowing firms both before and after the initiation of the loan deal. For example, using Fraction1, affiliated funds, on average, held 0.0045% of the borrowing firms before the deal, going up to 0.0091% after the deal. This amounts to an increase of 101% if compared with the pre-deal levels. If we use Fraction2, the increase in holdings is 138%. These magnitudes are highly significant in statistical as well as economic sense. Number of Lenders refers to the number of banks in the syndicate at least one of which is affiliated to a mutual fund family. The mean Change in Total Net Assets exceeds the median because some funds grow very rapidly, whereas, on the downside, a fund cannot lose more than 100% of its TNA.

That the median holdings are zero is a mere artifact of the fact that a significant number of affiliated funds do not hold the stocks of the borrowing firms. Also, the average holdings in the stocks of the borrowing firms appear low because a significant number of affiliated funds in the sample do not hold the borrowing stocks. These funds are assigned a holding level of zero, which causes the average holding to fall significantly. For the sake of completeness, therefore, Panel A also reports the average holdings of

Table 1
Summary statistics

This table presents various summary statistics for affiliated funds. Affiliated funds are defined as all those mutual funds belonging to a fund family that is part of a financial conglomerate involving a lending bank. To be included in the sample, total net assets of the fund must exceed at least $1 million, fund age must exceed one year, and stocks should comprise more than 85% of the funds' portfolio while bonds should not comprise more than 2% of the portfolio (this excludes approximately the top 2.5% of funds ranked in terms of bond holdings). Multiple classes of the same fund have been removed. The time period for the sample is from January. 1993 to June 2004. Panel A presents summary statistics for the control variables used in subsequent analyses. The number of observations for each variable is given under the condition that data on all the main variables should be non-missing. These observations are defined at the fund-stock deal level and the definitions for each variable are provided in the Appendix. Panel B describes the number of distinct entities that are involved in the sample. The number of distinct affiliated funds is the number of distinct funds that belong to financial conglomerates involving lending banks. This figure is obtained after removing multiple classes of the same fund. Number of distinct families captures the number of distinct fund families affiliated to lending banks. Number of distinct stocks refers to the number of distinct borrowing stocks and the number of distinct seals captures the number of distinct deals from which the data have been obtained. Each deal can involve only one borrowing firm (i.e., CUSIP) but can involve multiple lending banks and hence fund families and funds.

Panel A Summary statistics for affiliated funds

Variable	Number of observations	Mean	Median	Standard deviation
Control variable				
Lag Annual Return (percent)	10,931	6.23	5.03	21.95
Total Net Assets (Funds) (millions of dollars)	10,931	558.50	275.71	729.65
Number of Funds in Family	10,931	198.70	183	99.35
Turnover	10,931	0.77	0.64	0.66
Total Fees (percent)	10,931	1.54	1.42	0.71
Assets Under Family Management (millions of dollars)	10,931	85,289	82,134	51,235
Change in Total Net Assets (Funds) (millions of dollars)	10,931	259.93	7.60	1,493.2
Fund Age	10,931	7.25	6.0	4.77
Number of Lenders	10,931	9.51	6.0	9.90
Holding variable (a*ll holdings*)				
Fraction1,-before the deal (percent)	10,931	0.0045	0.00	0.04
Fraction2,-before the deal (percent)	10,931	0.0343	0.00	0.37
Fraction1,-after the deal (percent)	10,931	0.0091	0.00	0.08
Fraction2,-after the deal (percent)	10,931	0.0816	0.00	1.27
Holding variable (p*ositive holdings only*)				
Fraction1,-before the deal (percent)	695	0.072	0.018	0.163
Fraction2,-before the deal (percent)	695	0.545	0.138	1.366
Fraction1,-after the deal (percent)	1,050	0.095	0.020	0.232
Fraction2,-after the deal (percent)	1,050	0.844	0.141	4.009

Panel B Number of distinct entities involved in the sample

	Full sample	1993–1998	1999–2004
Number of distinct funds	769	419	595
Number of distinct families	44	35	31
Number of distinct stocks	1,053	549	749
Number of Distinct Deals/Facilities	1,505	641	864

borrowing stocks by affiliated funds for only those funds that report positive holdings in the borrowing stocks either before or after the deal (Positive Holdings Only). In this case, the figures are more than 10 times higher in comparison with the figures computed while including all the funds with zero holdings.

To get some idea of the economic significance of these holding levels, we compute the average dollar investment of the affiliated funds in each borrowing stock around the time period surrounding the loan announcement. If we condition on the affiliated funds that display a positive holding of borrowing stocks in the post-deal period, we find that these funds invest, on average, 0.83% of their total net assets in the stocks of borrowing firms. In dollar terms, this implies an investment of approximately $4.5 million in each borrowing firm. This figure was calculated by multiplying the average portfolio weight by the mean value of TNA for mutual funds taken from Table 1, Panel A ($558.5 million). This figure seems considerably large especially if compared with the median investment of $3.7 million that mutual funds, in general, hold in an average stock over our sample period.

Panel B of Table 1 provides information on the number of distinct players that are involved in this sample. Over the whole sample, our data contain information on 1,505 distinct loan deals involving 1,053 distinct stocks and 769 distinct affiliated funds. These funds belong to 44 distinct families. The table also divides the sample period into two halves of 6 years each. It appears that the observations are evenly distributed over the sample period.

All the results reported in the paper have been estimated using both Fraction1 and Fraction2. Given that they consistently deliver the same results, we report only the ones based on Fraction1. The ones based on Fraction2 are available upon request.

4. The effect of bank lending relations on fund holdings

We start by investigating how affiliated funds change their holdings in the stocks of firms borrowing from an affiliated bank in the wake of the deal (i.e., H1). We compute the Change in Fund Holdings over the 6 months before and 6 months after the initiation of the loan deal. We then compare the behavior of the affiliated funds with that of the control sample. In doing this, we implicitly assume that the affiliated funds do not have any knowledge about the occurrence of the deal until the deal initiation date and that they receive this knowledge only at the time of the deal's initiation. The fact that affiliated funds could have some prior knowledge about the deal before its actual initiation should only bias the test against us finding significant results.

(Unreported) univariate tests show that affiliated funds increase their holdings in the stocks of the borrowing firms by substantially larger amounts than their respective controls. For affiliated funds, the average ΔFraction is 0.0046%, while, for the case of five control funds, the equivalent magnitude is 0.0016%. Hence, the change in holdings for affiliated funds is approximately three (four) times larger than the changes exhibited by their respective control funds. The difference between the changes in holdings is also highly significant in a statistical sense for both the means and the medians. The *t*-tests and the Wilcoxon tests are each significant at the 1% level.

For the multivariate tests, we proceed in two steps. First, we compare the changes in stock holdings of affiliated funds with those of control funds. Second, we study whether the correlation (if any) between the change in holdings and the deal is limited to a few funds within the family or whether it is prevalent across the entire fund family.

4.1. Fund-level changes in stock holdings

We first compare the change in holdings in the stocks of borrowing firms of the affiliated funds with that of their respective control funds. We estimate the following model:

$$\begin{aligned}\Delta H_{f,i,d} = {} & \alpha + \beta\, \textit{Lending Conglomerate Dummy}_{f,i,d} \\ & + \lambda\, \textit{Affiliation Dummy}_{f} \\ & + \gamma\, \textit{Controls}_{f,i,d} + \varepsilon_{f,i,d}. \end{aligned} \quad (1)$$

$\Delta H_{f,i,d}$ is the percentage change in the holdings (Fraction) of fund f in the stock of borrowing firm i around loan deal d. Lending Conglomerate Dummy is a dummy equal to one if fund f belongs to a fund family that is part of a conglomerate involved in lending to firm i in deal d. The Affiliation Dummy is a dummy that takes a value of one for all the funds belonging to families affiliated to banks regardless of whether they lend to firm i in deal d or not. Our key variable is the Lending Conglomerate Dummy. If affiliated funds change their holdings in the stocks of the borrowing firms more than their matched sample funds, the coefficient on this variable should be positive ($\beta > 0$).

Controls is a vector of control variables made up of fund, family, and deal characteristics. These include Lag Annual Return of the Fund, Total Net Assets (Fund), Total Net Assets (Family), Turnover, Total Fees, Change in Total Net Assets, and Number of Lending Banks. All the specifications also include year dummies and fund category dummies (defined at the level of the fund ICDI Objective Codes). Alternative specifications also control for clustering at the fund and the family levels. A more detailed description of these variables and of the units in which they are represented is provided in the Appendix.

The results are reported in Table 2, Columns 1–3. We report the results using five control funds per affiliated fund. The results show that the Lending Conglomerate Dummy is positively significant in each specification. The coefficient of the Lending Conglomerate Dummy is 0.0029%. Given that the average ΔH across the control sample is 0.0016%, this implies that affiliated funds change their holdings in the stocks of the borrowing firms by 181% more than the average control fund. The results are highly significant both in the statistical and economic sense. If we include repeat borrowers (i.e., those firms that borrow repeatedly from the same bank within 5 years) in the sample, the results are much weaker. The main reason for this is that the bank is likely to learn substantial new information about a borrower at the time of the loan origination if the borrower has not borrowed from this particular bank in the recent past. With ongoing lending relations, the amount of additional information gathered with every new deal becomes ambiguous as does the timing of the transfer of this information to the asset management arms.

Although the results provide support for H1, affiliated banks might not only change their holdings in the stocks of borrowing firms but also do so in all the stocks located in the same industry. This would imply that these results do not show any real relation between the activities of the lending and the asset management arms of the conglomerate. To address this potential concern, we now conduct a stricter test of H1 by measuring the increase in holdings of borrowing stocks in excess of the increase in holdings of all the other stocks located in the same industry. This regression of the net holding increase can be specified as

$$\begin{aligned}\Delta H_{f,i,d} - \Delta H_{f,c,d} = {} & \alpha + \beta\, \textit{Lending Conglomerate Dummy}_{f,i,d} \\ & + \lambda\, \textit{Affiliation Dummy}_{f} \\ & + \gamma\, \textit{Controls}_{f,i,d} + \varepsilon_{f,i,d}, \end{aligned} \quad (2)$$

where $\Delta H_{f,i,d}(H_{f,c,d})$ is the percentage change in the holdings of fund f in the stock of borrowing firm i (control firm c) around loan deal d. The control stocks are those nonborrowing stocks that are being held by fund f during the same time period and that belong to the same four-digit standard industrial classification (SIC) code industry as the borrowing stock. Because any fund is likely to hold more than one control stock, c, at any time, we compute

Table 2
Change in holdings of borrowing stocks around deal date

This table presents results of multivariate tests for comparing the changes in holdings of mutual funds in the stocks of borrowing firms. In Columns 1–3, we relate the change in holdings of affiliated funds with the change in holdings of control funds. Affiliated funds are defined as all those mutual funds that belong to a fund family that is part of a financial conglomerate involving a lending bank. Control funds are all other funds that might or might not belong to a financial conglomerate. We estimate

$$\Delta H_{f,i,d} = \alpha + \beta\ Lending\ Conglomerate\ Dummy_{f,i,d} + \lambda\ Affiliation\ Dummy_{f} + \gamma\ Controls_{f,i,d} + \varepsilon_{f,i,d},$$

where $\Delta H_{f,i,d}$ is the change in the holdings of fund f in the stock of borrowing firm i around loan deal d (i.e., −1/2, +1/2 years around the deal initiation date). It is measured by subtracting the average percentage stock holding during the 6 months before the deal from the average percentage stock holdings in the 6 months following the deal. Lending Conglomerate Dummy is equal to one if a mutual fund, f, belongs to a fund family that is part of a conglomerate involved in lending to firm i in deal d. Affiliation Dummy takes a value of one for all those funds that belong to families affiliated to banks, and Controls is a vector of control variables made up of fund, family, and deal characteristics. The change in holdings of affiliated funds is compared with the change in holdings of the five closest control funds. Control funds for each affiliated fund are identified on a yearly basis using investment objective, total net assets of the fund, total net assets of the fund family, and fund return over the previous year. A borrowing firm is defined as that firm borrowing from a bank that is part of a conglomerate containing a fund family.

In Columns 4–6, we compare the changes in holdings of mutual funds in the stocks of borrowing firms with respect to the changes in their holdings of other similar control stocks. The control stocks must belong to the same four-digit standard industrial classification code industry as the borrowing stock. This net change in holdings of affiliated funds is compared with the net change in holdings of control funds. The change in holdings is measured according to the following model:

$$\Delta H_{f,i,d} - \Delta H_{f,c,d} = \alpha + \beta\ Lending\ Conglomerate\ Dummy_{f,i,d} + \lambda\ Affiliation\ Dummy_{f} + \gamma\ Controls_{f,i,d} + \varepsilon_{f,i,d}.$$

$\Delta H_{f,i,d}(\Delta H_{f,i,d})$ is the change in the holdings of fund f in the stock of borrowing firm i (control firm c) around loan deal d. The change in holdings in both borrowing and control stocks is measured by subtracting the average percentage stock holding during the six months before the deal from the average percentage stock holdings in the six months following the deal. Lending Conglomerate Dummy is equal to one if a mutual fund, f, belongs to a fund family that is part of a conglomerate involved in lending to firm i in deal d.

The observations are given at the fund-stock deal level. To be included in the sample, total net assets of the funds must exceed at least $1 million, fund age must exceed one year, and stocks should comprise more than 85% of the funds' portfolio and bonds should not comprise more than 2% of the portfolio (this excludes approximately the top 2.5% of funds ranked in terms of bond holdings). Multiple classes of the same fund have been removed. Different specifications control for clustering at the fund and the family level. All regressions include style dummies defined at the level of the investment objective category as well as year dummies. Absolute values of the t-statistics appear in parentheses. ***, **, And * denote significance levels of 1%, 5%, and 10%, respectively, using heteroskedasticity robust standard errors.

Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Lending Conglomerate Dummy	0.0029***	0.0029***	0.0029***	0.0062***	0.0062***	0.0062***
	(4.49)	(3.23)	(1.98)	(2.11)	(1.75)	(1.90)
Affiliation Dummy	0.0001	0.0001	0.0001	−0.0023	−0.0023	−0.0023
	(0.43)	(0.34)	(0.28)	(1.01)	(0.79)	(0.85)
Lag Annual Return	0.0014	0.0014	0.0014	−0.0162***	−0.0162***	−0.0162***
	(1.34)	(1.37)	(1.50)	(3.00)	(3.22)	(3.05)
Total Net Assets (Fund)	0.0009***	0.0009***	0.0009***	−0.0025***	−0.0025***	−0.0025***
	(6.45)	(5.14)	(4.51)	(3.41)	(2.62)	(2.39)
Total Net Assets (Family)	−0.0001	−0.0001	−0.0001	−0.0006	−0.0006	−0.0006
	(0.65)	(0.57)	(0.52)	(1.10)	(0.87)	(0.81)
Turnover	0.0004	0.0004	0.0004	0.0023***,**	0.0023***,*	0.0023***,*
	(1.40)	(1.36)	(1.38)	(2.11)	(1.81)	(1.95)
Total Fees	−0.0001	−0.0001	−0.0001	−0.0005	−0.0005	−0.0005
	(0.39)	(0.31)	(0.30)	(0.60)	(0.55)	(0.51)
Change in Total Net Assets	0.0001*	0.0001*	0.0001*	−0.0003	−0.0003	−0.0003
	(1.87)	(1.65)	(1.68)	(1.19)	(1.11)	(1.02)
Number of Lending Banks	−0.0004***	−0.0004**	−0.0004**	0.0003	0.0003	0.0003
	(2.69)	(2.53)	(2.06)	(0.37)	(0.43)	(0.38)
Intercept	0.0003	0.0003	0.0003	0.0199**	0.0199**	0.0199*
	(0.15)	(0.14)	(0.15)	(2.32)	(2.08)	(1.82)
Clustering	None	Fund	Family	None	Fund	Family
Style dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.01	0.01	0.01	0.01	0.01	0.01
Number of observations	65,008	65,008	65,008	65,008	65,008	65,008

the equal-weighted mean holding of the mutual funds in these stocks at each point and then compute the changes as described above. The right-hand-side variables are defined in an identical manner to Eq. (1). H1 again posits that Lending Conglomerate Dummy should be significantly positive, implying that the net change in holdings in borrowing firms is larger for affiliated banks than for their respective controls.

The results are presented in Table 2, Columns 4–6. The results show that the net change in the stocks of borrowing firms is much greater for affiliated funds than for the control funds. The coefficient on the Lending Conglomerate Dummy is 0.0062%. This implies that the net change in the holdings of affiliated funds in the stocks of borrowing firms is approximately 100% more than that shown by the average control fund. Overall, these results

show that the net change in holdings exhibited by affiliated funds is also significantly higher than that of their respective control funds, providing support for H1. The results are highly significant both statistically and economically and are robust across the different tests and specifications employed.

Given these results, a question that arises is the degree to which affiliated funds belonging to the same family make coordinated trades in the stocks of borrowing firms. We find that within each family, for each deal involving a new company, 10% of the funds in the family, on average, increase their holdings in the borrowing stocks while 3.4% of the funds decrease their holdings in the borrowing stocks. Because the average number of funds, after collapsing multiple classes of the same fund and removing funds that hold less than 85% of their portfolio in stocks and more than 2% of their portfolio in bonds, in each affiliated family is eight, one fund per family, on average, increases its holdings in the borrowing stocks and one fund per every three families reduces its holdings in these stocks. This shows that most of the other funds in the family do not react to the origination of the deal. Moreover, affiliated fund managers have an incentive to avoid correlated trading to minimize their price impact.

4.2. Change in family holdings

Do these findings aggregate at the family level? That is, is there evidence of an overall family response to the issuance of the loan? To address this issue, we test whether families affiliated to lending banks increase their holdings in the stocks of borrowing firms more than families that are either unaffiliated or families that are affiliated to nonlending banks in that particular deal.

We identify up to five control families for each affiliated family from a pool of unaffiliated and affiliated nonlending families. We choose the families that are closest to the affiliated family in terms of the TNA under family management and the total number of funds in the family. We aggregate at the family level by calculating the TNA-weighted average of the fund-level variables to obtain the corresponding variables at the family level and perform regressions analogous to Eq. (1). In particular, we estimate:

$$\Delta H_{F,i,d} = \alpha + \beta\, Lending\ Conglomerate\ Dummy_{F,i,d} + \lambda\, Affiliation\ Dummy_{F} + \gamma\, Controls_{F,i,d} + \varepsilon_{F,i,d}, \quad (3)$$

where $\Delta H_{F,i,d}$ is the change in the holdings of family F in the stock of borrowing firm i around loan deal d. Family holdings of the borrowing stocks are constructed in two distinct ways. The first method computes the Average Holding/Fund in the family by taking an average of Fraction1 and Fraction2 across the family for all the funds that belong to this family. The second method, Total Holding, computes the overall holding of the borrowing stock at the family level as the sum of the holdings of all the funds belonging to the family and then constructs Fraction from these total holdings. The change in holdings is measured by subtracting the average percentage stock holding during the 6 months before the deal from the average percentage stock holdings in the 6 months following the deal. Lending Conglomerate Dummy is equal to one if the family, F, is part of a conglomerate involved in lending to firm i in deal d. Affiliation Dummy takes a value of one for all those families affiliated to banks, and Controls represent a vector of control variables made up of family and deal characteristics. The control variables are identical as in the previous specifications, apart from the inclusion of Change in Family Assets on the right-hand side of the regression equation. All control variables are computed at the family level as a TNA-weighted average of the fund-level variables. All specifications contain year dummies, and some are clustered at the family level. Observations are at the family-stock deal level.

The results are presented in Table 3 and confirm our earlier findings. The coefficient of the Lending Conglomerate Dummy is positive and significant across all specifications, suggesting that affiliated families increase their holdings in the stocks of borrowing firms appreciably more than control families. The results are also economically significant. For example, the coefficient of Lending Conglomerate Dummy in specifications Eqs. (1) and (2) is 0.0075%. Given that the change in holding in the stocks of the borrowing firms for the control sample is 0.005%, this implies that affiliated families increase their holdings in the stocks of borrowing firms by 150% more than the average control family in the sample. The results are qualitatively identical when we use Total Holdings to measure the family response and consistently show that bank-affiliated funds and families increase their holdings in the stocks of firms that borrow from their affiliated banks more significantly than their respective controls.

5. Privileged information flow or attention?

This section aims to test whether the portfolio rebalancing of affiliated funds is driven by privileged inside information or attention. In the former case, we should observe that the portfolio positions of affiliated funds in borrowing stocks perform better than their other positions in nonborrowing stocks located in the same industry over the same time. In the latter case, however, these stocks need not perform systematically better than the other stocks being held by these same funds over the same time. Moreover, inside information implies that changes in fund holdings in borrowing stocks should help to forecast the returns for these borrowing firms in the post-deal period and these results should be stronger where, a priori, the lending bank is likely to have more privileged information about the borrowing firms.

5.1. Is it attention or information?

We focus directly on the borrowing stocks and compare their return in the period immediately following the deal initiation with the return affiliated funds obtain from their holdings in nonborrowing stocks located in the same industry in the same time period. If the changes in

Table 3
Change in family stock holdings around deal date

This table presents results of multivariate tests for comparing the changes in holdings of mutual funds families in the stocks of borrowing firms. The change in holdings of affiliated families is compared with the change in holdings of control families. Affiliated families are defined as all those fund families that belong to a financial conglomerate that involves a lending bank. Control families are all other families that may or may not belong to a financial conglomerate. We estimate

$$\Delta H_{F,i,d} = \alpha + \beta\ Lending\ Conglomerate\ Dummy_{F,i,d} + \lambda\ Affiliation\ Dummy_{F} + \gamma\ Controls_{F,i,d} + \varepsilon_{F,i,d},$$

where $\Delta H_{f,i,d}$ is the change in the holdings of family F in the stock of borrowing firm i around loan deal d. Family holdings of the borrowing stocks are constructed in two distinct ways. The first method computes the Average Holding/Fund in the family by taking an average of Fraction across the family for all the funds that belong to this family. The second method, Total Holding, computes the overall holding of the borrowing stock at the family level as the sum of the holdings of all the funds belonging to the family and then constructs Fraction from these total holdings. The change in holdings is measured by subtracting the average percentage stock holding during the 6 months before the deal from the average percentage stock holdings in the 6 months following the deal. Lending Conglomerate Dummy is equal to one if the family, F, is part of a conglomerate that is involved in lending to firm i in deal d. Affiliation Dummy takes a value of one for all those families affiliated to banks, and Controls represent a vector of control variables made up of family and deal characteristics. All control variables are computed at the family level as a total net assets-weighted average of the fund-level variables. Control families are matched on a yearly basis with the affiliated families on the basis of total net assets under family management and total number of funds in the family. Five closest families are selected in this way. Observations are at the family-stock deal level. Different specifications control for clustering at the family level. All regressions include year dummies. Absolute values of the t-statistics appear in parentheses. ***, **, And * denote significance levels of 1%, 5%, and 10%, respectively, using heteroskedasticity robust standard errors.

Explanatory variable	Average holding/fund		Total holdings	
	(1)	(2)	(3)	(4)
Lending Conglomerate Dummy	0.0075***	0.0075***	0.0172***	0.0172**
	(4.27)	(3.94)	(3.06)	(2.23)
Affiliation Dummy	0.0023	0.0023	−0.0072	−0.0072
	(1.18)	(0.74)	(0.85)	(0.59)
Lag Annual Return	0.0156**	0.0156*	0.0338	0.0338
	(2.35)	(1.84)	(1.24)	(0.68)
Total Net Assets (Fund)	0.0025***	0.0025**	0.0138***	0.0138**
	(3.57)	(2.30)	(4.34)	(2.38)
Total Net Assets (Family)	−0.0025**	−0.0025**	−0.0037	−0.0037
	(2.29)	(2.15)	(0.95)	(0.78)
Turnover	0.0017	0.0017	0.0048	0.0048
	(0.98)	(0.91)	(0.66)	(0.82)
Total Fees	−0.0009	−0.0009	−0.0064	−0.0064
	(0.66)	(0.58)	(1.12)	(0.98)
Change in Total Net Assets	−0.0004*	−0.0004	−0.0018**	−0.0018*
	(1.89)	(1.46)	(2.07)	(1.86)
Number of Lending Banks	−0.0002	−0.0002	−0.0035	−0.0035
	(0.30)	(0.33)	(1.25)	(1.54)
Change in Family Assets	−0.0001	−0.0001	−0.0001	−0.0001
	(0.46)	(0.34)	(0.96)	(0.76)
Intercept	−0.0060	−0.0060	−0.0338	−0.0338
	(0.50)	(0.44)	(0.70)	(0.49)
Clustering	None	Family	None	Family
Year dummies	Yes	Yes	Yes	Yes
R^2	0.01	0.01	0.01	0.01
Number of observations	5,963	5,963	5,963	5,963

the funds' portfolio are based on privileged information, then the returns of the funds' positions in borrowing stocks should be greater than the returns from the funds' positions in nonborrowing stocks located in the same industry about which the fund managers need not possess privileged information. We refrain from analyzing the performance of the entire fund, however, because a change in the holdings of a few borrowing stocks need not have a discernable impact on the performance of the entire fund. Moreover, these results would get contaminated by the changes taking place in the holdings of other stocks being held by these funds over the same time.

The design of our test also controls for the possibility that mutual fund transactions forecast stock returns. For example, Grinblatt and Titman (1989) find that aggressive growth fund transactions yield an alpha of about 3% per annum. Therefore, to check whether funds do particularly well with their trades in firms that have initiated a relation with their affiliated bank, we use the fund as its own control. Because we focus on the holdings of the same fund in both the borrowing and nonborrowing stocks at the same time, any such effects should cancel out. Furthermore, this test controls for fund-specific characteristics such as managerial ability and other spurious correlations that could have contaminated our results had we analyzed performance at the fund level across different funds.

We construct a portfolio long in the stocks of borrowing firms in which fund holdings increase by at least 25% in the six months following the loan announcement (in comparison

Table 4
Relative performance of holding positions in borrowing and nonborrowing stocks

This table compares the performance of affiliated funds' positions in borrowing stocks with that of positions in nonborrowing stocks (lying in the same industry as the borrowing stocks) held by the same fund in the same period in the year following the initiation of the loan deal. Affiliated funds are defined as all those mutual funds belonging to a fund family that is part of a financial conglomerate involving a lending bank. The strategy goes long in the stocks of borrowing firms in which fund holdings are increasing by at least 25% in the 6 months following the loan announcement (in comparison with the 6 months before the loan announcement). The strategy goes short in other nonborrowing stocks located in the same four-digit standard industrial classification code industry, which are also being held by the fund at the same time. We identify 352 borrowing stocks that meet these criteria and 769 nonborrowing stocks. Only those borrowing stocks are included for which suitable nonborrowing stocks could be found. These positions are held for 6 months. The equal- and portfolio-weighted portfolio returns are then regressed on the Carhart (1997) four-factor model. Portfolio weights are the fraction of the funds' assets invested in each stock. The time period for the tests is from January 1993 to June 2004. ***, ** And * denote significance levels of 1%, 5%, and 10%, respectively, using heteroskedasticity robust standard errors. The results are expressed in nonpercentage terms. The number of observations. refers to the number of months over which the regressions are estimated.

	Measuring performance using equal weights		Measuring performance using portfolio weights	
α	0.01596**	(2.51)	0.01584**	(2.19)
β_{Rm-Rf}	0.05580	(0.31)	0.09285	(0.47)
β_{SmB}	−0.34874***	(−2.64)	−0.36465**	(−2.41)
β_{HmL}	0.02195	(0.13)	0.03625	(0.20)
β_{UmD}	0.11226	(1.59)	0.15194*	(1.74)
Number of observations	123		123	

with the six months before the loan announcement) and short in other nonborrowing stocks located in the same four-digit SIC code industry that are also being held by the fund at the same time. We then regress the return of this portfolio on the four-factor model (Carhart, 1997) to obtain the abnormal performance.

The returns on the long and short positions are computed using both equal- and portfolio-weighted averages of returns of the stocks in the portfolios for each month/year. Portfolio weights consider each stock according to the actual fraction of the portfolio that the fund managers assign to these stocks. This strategy allows us to take into account the actual representation of these stocks in the fund portfolio. We are able to identify 352 borrowing stocks and the returns of the funds' positions in these stocks are compared with 769 distinct nonborrowing stocks held by these funds located in the same industry.

The results are reported in Table 4. Panels A and B report the results for equal- and portfolio-weights, respectively. In both panels we observe that portfolios based on borrowing stocks do much better that those based on nonborrowing stocks. The difference in returns is a highly significant 160 bps per month, on average. Those months are excluded from the analysis in which there was no stock in the portfolio. In this test as well as in all the following tests, should a stock get delisted during its holding period, it gets dropped from the portfolio at the time of the delisting. In this way, our analysis does not suffer from look-ahead bias.

These findings show that funds do reap a substantial advantage from investing in the stocks of firms with which their affiliated banks have a lending relation. The portfolio rebalancing of the affiliated funds in favor of borrowing stocks has a positive impact on the performance of these funds. These results, therefore, support H2, i.e., that the portfolio rebalancing of the affiliated funds is information-driven. We now move on to consider whether this is inside information. That is, we test whether it is possible for other unaffiliated funds to mimic these strategies of affiliated funds.

5.2. Is it inside information?

Is the superior performance of affiliated funds' holdings in the stocks of borrowing firms replicable by other unaffiliated funds? More specifically, at the time of the deal initiation, does there exist some additional information about the borrowing firms that is not available to outside investors? If the initiation of the deal is itself a positive signal about the borrowing firms, funds not affiliated to the lending bank would also be able to trade on it, i.e., this information would be a sufficient signal for outside mutual funds to invest in the stocks of borrowing firms. However, information about the loan grant by itself might not be a perfect signal about the quality of the borrowing firm. In this case, outside funds might not be able to duplicate the investment strategy of affiliated funds at the time of the deal announcement. Affiliated funds would be able to have a profitable strategy only if they have access to privileged inside information. They would, therefore, increase their holdings in stocks for which they have positive information and decrease their holdings in stocks for which they have negative information.

5.2.1. Main tests

To check the existence of insider information, we divide the stocks of borrowing firms into two categories: buys and sells. We define buys (sells) as those stocks in which the affiliated funds increase (decrease) their position by at least 25% around the initiation of the deal. We subtract the average percentage holdings over the 6 months before the deal from the average percentage holdings over the 6 months after the deal. Borrowing stocks in which some funds increase holdings while other funds decrease holdings are classified as buys. To be

classified as a sell, at least one fund must decrease holdings in this stock in the post-deal period while no fund should increase holdings in this stock. We are able to identify 352 buys and 121 sells that meet these criteria. If our hypothesis about inside information is correct, buys should out-perform sells in the period following the deal (i.e., H2). To test this hypothesis, we use two methodologies: the calendar time portfolio regressions as well as the Ibbotson (1975) returns across time and securities (RATS) method. This methodology estimates one cross-sectional regression for each event month j ($j = 0$ is the deal date) with j going from 1 to 12. The following regression is run for each event month j:

$$(R_{i,t} - R_{f,t}) = a_j + b_j(R_{m,t} - R_{f,t}) + c_j SMB_t + d_j HML_t + e_j UMD_t + \varepsilon_{i,t},$$

where $R_{i,t}$ is the monthly return for stock i in calendar month t. $R_{f,t}$ and $R_{m,t}$ are the risk-free rate and the return on the market, respectively. SMB_t, HML_t, and UMD_t are the monthly returns on the size, book-to-market, and the momentum factors in month t, respectively. The numbers reported are sums of the intercepts of cross-sectional regressions, a_j, over the relevant event-time periods. The date of the deal's initiation is taken as the event date in each of these tests.

Table 5, Panel A presents the results for the calendar time strategy in which the monthly returns on an equal-weighted portfolio that goes long in buys and short in sells at the start of the month following the initiation of the deal is regressed on the four-factor model. Each stock is kept in the portfolio for a period of 6 months after which it is dropped. We see that buys do out-perform the sells by 1.65% per month. This result is highly significant in the statistical and economic sense. Those months are excluded from the analysis in which there was no stock in the portfolio. On average, in a given month, the portfolio contains 15 stocks in the long portfolio and six stocks in the short portfolio. In Table 5, we also separately control for firm size and leverage, respectively, while constructing these portfolios. We do not show the results for the sample matched on market-to-book ratio as the buys and sells did not differ significantly in the median in this dimension. Size denotes the total assets of the firm in the previous year and is measured using CRSP-Compustat Merged (CCM) data item 6. Leverage denotes the firm's leverage in the previous year, and it is the ratio of long-term debt to the total equity of the firm (CCM data 9/CCM data 60). The groups are matched by removing the minimum number of largest observations from the group with the higher median to ensure that the medians of the groups are equal. The results remain unchanged after controlling for these stock characteristics.

Table 5, Panel B presents the cumulative abnormal returns obtained using the RATS approach for the four-factor model. These results confirm the findings of the calendar time analysis. In both cases, the buys out-perform the sells. For example, buys generate a cumulative abnormal return (CAR) of 3.42% during the first 6 months following the deal initiation that is both economically and statistically significant. Sells produce a CAR that is not significantly different from zero. The results also show that the major component of the CAR for the buys takes place in the first six months following the deal's initiation. These results are consistent with the existence of insider information available to the banks and their affiliated funds that is revealed to the market in the period following the deal's initiation and provides some justification for the selection of the holding period.

Next, to control for spurious correlations and confounding effects, we compare the returns of the buys and sells with those of other similar stocks. This controls for the possibility that buys and sells might belong to segments or industries that change in value in the same way at the time of the loan. Similar stocks are identified from a pool of nonborrowing stocks as those stocks that lie in the same four-digit industry as well as the same size and market-to-book quartiles as each of the buys and sells. We then construct a portfolio long in borrowing stocks and short in these similar control stocks and regress the (equally weighed) return on such a portfolio on the three- and four-factor models. This strategy is constructed separately for buys and sells. The long and short positions are taken one month after the start of the loan deal and are held for a period of six months. Both buys and sells are identified in the way described above.

The results for buys versus controls and those for sells versus controls are in Table 6. The results show that buys do out-perform their similar control stocks. This trading strategy yields a significant alpha of 121 bps per month. Moreover, sells tend to under-perform their similar control stocks by 95 bps per month, which is significant in an economic sense but not in a statistical sense. Apart from showing that our earlier results are not being driven by random industry trends, these findings highlight the fact that affiliated funds possess some privileged information about the borrowing firms that is not publicly available at the time of the loan deal. This allows them to successfully increase holdings in winning stocks and decrease holdings in losing stocks around the time of the deal initiation. Given the inside nature of this information, control funds outside the family cannot pursue this strategy. This could explain why the funds/families we use as controls do not change their holdings significantly in borrowing stocks in the period around the deal.

We also conduct a finer test of the privileged inside information hypothesis in which we condition on the degree of inside information the lending conglomerate might have about the borrowing firm. Because affiliated funds earn abnormal returns due to their access to this privileged information, we expect these funds to generate higher returns from the borrowing stocks about which they have more inside information. To test for this, we condition on the size of the loan. We posit that deals in which the borrowed amount represents a larger fraction of the firm's total assets should encourage banks to analyze the borrower more thoroughly and hence generate more insider information in the process. We proxy for the level of insider information by using the ratio of the Deal Amount (obtained from Dealscan) to the value of the total assets (CRSP Compustat Merged data item 6) of the firm at the end of the previous calendar year with

Table 5
Analysis of borrowing firms' performance

This table presents the results for the performance of the borrowing firms using either the calendar time portfolio regression (CTPR) approach or the return across time and securities approach (RATS) of Ibbotson (1975).

The dependent variable is the monthly returns on an equal-weighted portfolio that goes long in the buys and short in the sells at the start of the month following the initiation of the deal. Buys (sells) are defined as those stocks for which affiliated funds increase (decrease) holdings in the period after the deal in comparison with its level in the period before the deal by at least 25%. Each stock is kept in the portfolio for a period of 6 months after which it is dropped. We are able to identify 352 buys and 121 sells that meet these criteria. Buys and sells matched on size and leverage are determined by removing the minimum number of largest observations from the group with the higher median to ensure that the medians of the resulting groups are equal. Size denotes the total assets of the firm in the previous year and is measured using Center For Research in Security Prices-Compustat Mergered (CCM) data item 6. Leverage denotes the firm's leverage in the previous year and is the ratio of long-term debt to the total equity of the firm (CCM data 9/CCM data 60). Abnormal returns are measured using the intercept of time-series regressions conducted using the Carhart (1997) four-factor model. The time period for the tests is from January 1993 to June 2004. ***, **, And * denote significance levels of 1%, 5%, and 10%, respectively, using heteroskedasticity robust standard errors. The results are expressed in nonpercentage terms. The number of observations is the number of months over which the regressions are estimated.

The monthly cumulative average abnormal returns is reported for borrowing firms obtained using the Ibbotson (1975) RATS method combined with the Carhart (1997) four-factor model. We subdivide borrowing firms into buys and sells. The numbers reported are the sums of the intercepts of cross-sectional regressions over the relevant time periods expressed in percentage terms. Number of observations for each column is given in parentheses. The time period for the analysis is from January. 1993 to June 2004. ***, **, And * denote significance levels of 1%, 5%, and 10%, respectively using two-tailed tests.

Panel A. Results of calendar time regressions

	All buys and sells		Buys and sells matched on size		Buys and sells matched on leverage	
	Coefficient	(t-Statistic)	Coefficient	(t-Statistic)	Coefficient	(t-Statistic)
α	0.01651**	(2.07)	0.0173**	(2.15)	0.0150*	(1.88)
β_{Rm-Rf}	0.01825	(0.11)	0.0250	(0.17)	0.0731	(0.49)
β_{SmB}	−0.02587	(−0.16)	−0.0300	(−0.19)	0.0059	(0.04)
β_{HmL}	0.05532	(0.22)	0.0559	(0.25)	0.1529	(0.66)
β_{UmD}	0.26292**	(2.21)	0.2430*	(1.83)	0.2433*	(1.87)
Number of observations	123		121		121	

Panel B. Results for RATS

Months	Buys (352)	Sells (121)
(+1,+1)	−0.39%	−0.96%
(+1,+2)	1.21	−0.27
(+1,+3)	1.71	−0.62
(+1,+4)	2.02	−0.95
(+1,+5)	2.38	−1.29
(+1,+6)	3.42*	−4.23
(+1,+7)	3.39*	−3.96
(+1,+8)	3.67*	−6.58*
(+1,+9)	4.85**	−4.35
(+1,+10)	5.30**	−5.36
(+1,+11)	4.92**	−2.88
(+1,+12)	5.24**	−3.48

respect to the year of the deal initiation. We divide the sample of buys and sells on the basis of this ratio. High-stake firms (firms with more insider information) are defined as those firms for which the ratio of deal amount and the firm's total assets exceeds the median for the complete sample (16%). All other firms are classified as low-stake firms (firms with less insider information).

We use calendar time portfolio regressions to analyze the performance of borrowing firms in the post-deal period. We regress the monthly returns on an equal-weighted portfolio that goes long in buys and short in sells at the start of the month following the initiation of the deal on the Carhart (1997) four-factor model. Each stock is kept in the portfolio for a period of six months after which it is dropped. We posit the performance differential of buys versus sells to be more significant for highsstake firms as funds would have access to better inside information in this case.

The results are reported in Table 6, Panel B. As expected, we observe that high-stake firms have a higher point estimate of differential abnormal performance than the low-stake firms. The portfolio abnormal returns amount to a highly significant 2.04% per month. For the low-stake category, such a portfolio yields 23 bps per month which turns out to be statistically insignificant. Also, while buys out-perform sells in both categories, the results are only significant for the high-stake category, as was hypothesized above. As a robustness check, we also consider a specification in which stake is defined in terms of the firm's market capitalization as opposed to assets. The (unreported) results are consistent with the ones shown above.

Table 6
Post-deal performance of borrowing stocks: conditioning on stock characteristics and information

This table examines the post-deal performance of borrowing stocks while controlling separately for stock characteristics and the amount of insider information generated during the lending process. Panel A controls for stock characteristics by comparing the performance of borrowing stocks against similar control stocks matched on size and market-to-book ratios. Panel B compares the performance of those borrowing stocks for which more or less insider information is generated during the lending process. Both panels classify the stocks borrowing from affiliated funds into buys and sells. Buys (sells) are defined as those stocks for which affiliated funds increase (decrease) holdings in the period after the deal in comparison to its level before the deal by at least 25%.

In Panel A, the dependent variable is the monthly returns on an equal-weighted portfolio that goes long in buys and sells, respectively, and short in control stocks at the start of the month following the initiation of the deal. Control stocks are selected from a pool of nonborrowing stocks and must belong to the same four-digit industry as well as the same size and market-to-book quartiles as the borrowing stocks. Each stock is kept in the portfolio for a period of 6 months after which it is dropped. Only those buys and sells are selected for which suitable controls stocks could be identified. Controls are identified for 211 buys and 91 sells. The number of controls is 910 for buys and 578 for sells.

In Panel B, the ratio of deal size to the total assets of the firm (data item 6 from Center For Research in Security Prices-Compustat Merged) is used as the proxy for the amount of insider information. High-stake firms (firms with more insider information) are defined as those firms for which the ratio of deal size and the firm's total assets exceeds the median for the complete sample (16%). All other firms are classified as low-stake firms (firms with less insider information). Deal size is measured using the Deal Amount variable from Dealscan. Identified are 148 high-stake buys, 62 high-stake sells, 176 low-stake buys and 53 low-stake sells. The dependent variable is the monthly returns on an equal-weighted portfolio that goes long in the buys and short in sells at the start of the month following the initiation of the deal. Each stock is kept in the portfolio for a period of 6 months after which it is dropped.

Abnormal returns are measured using the intercept of time-series regressions using the Carhart (1997) four-factor model. The time period for the tests is from January 1993 to June 2004. ***, **, And * denote significance levels of 1%, 5%, and 10%, respectively, using heteroskedasticity robust standard errors. The results are expressed in nonpercentage terms. Number of observations refers to the number of months over which the regressions are estimated.

Panel A. Conditioning on stock characteristics

	Buys versus controls		Sells versus controls	
α	0.0121**	(2.08)	−0.0095	(−1.17)
β_{Rm-Rf}	−0.0687	(0.68)	−0.2855	(−1.42)
β_{SmB}	0.0793	(0.73)	0.1892	(1.05)
β_{HmL}	0.3032*	(1.95)	0.8822**	(2.47)
β_{UmD}	0.1575*	(1.75)	−0.2485	(−1.41)
Number of observations	123		111	

Panel B. Conditioning on insider information

	High-stake firms		Low-stake firms	
α	0.0204**	(1.99)	0.0023	(0.22)
β_{Rm-Rf}	−0.0786	(−0.35)	−0.1360	(−0.64)
β_{SmB}	−0.2647	(−1.39)	−0.1352	(−0.45)
β_{HmL}	−0.1344	(−0.41)	0.4908	(1.55)
β_{UmD}	0.4107**	(2.47)	−0.1904	(−0.80)
Number of observations	102		100	

5.2.2. Robustness tests

We now consider a series of robustness tests. One potential issue is that some of our results could be due to some known anomalies such as value and growth effects, leverage effects, governance and agency costs, liquidity, and bankruptcy risks. We address this issue by controlling for the following alternative dimensions: size, market-to-book, debt-to-equity, equity-based compensation, return volatility, lagged annual return, liquidity, and expected default frequency. Size is the total assets of the firm in the previous year and is measured using CRSP-Compustat Merged (CCM) data item 6. Market-to-book ratio is calculated as the price per share multiplied by the number of shares outstanding and divided by the book value of equity [(CCM data 24*CCM data 25)/CCM data 60]. Leverage is computed as the ratio of long-term debt to the total equity of the firm (CCM data 9/CCM data 60). Equity based compensation is the compensation of each firm's top five executives in the previous year. This is obtained from the Compustat Executive Compensation Database, and for each executive it is the value of the options granted divided by the total compensation of the executive (BLK_VALU/TDC1). Return volatility is the standard deviation of monthly stock returns in the previous year. Lagged annual return is the total yearly stock return in the previous year. Liquidity is measured as the sum of the monthly trading volume over the previous year divided by the number of shares outstanding at the end of that year. Expected default frequency is the distance to default of each firm over the previous year, computed using the procedure described by Bharath and Shumway (2004). All stock returns and trading volumes are from CRSP Monthly Stocks. We compare buys and sells, and high-stake buys and high-stake sells on each of these dimensions in terms of both means and medians. Whenever we spot a significant difference between the stocks on any of these dimensions, we remove the minimum number of largest observations from the group

with the higher median to ensure that the medians of the resulting groups are equal. The (unreported) results show that the abnormal portfolio returns remain unaffected. Furthermore, we also take a closer look at the performance differential between the buys and their respective controls by comparing these stocks on each of the other six dimensions listed above apart from size and market-to-book on which they are already matched. We find that the abnormal returns remain unchanged even after performing the match.

We also check if the betas of borrowing firms (and consequently their alphas) are systematically affected around the initiation of the loan. We use the procedure outlined in Grullon and Michaely (2004). We find no change in the betas of any of the borrowing firms, whether they are buys or sells or high-stake buys or sells.

Furthermore, given the magnitude of our results, we also compare the fraction of the total monthly volume generated by the trades of the average affiliated fund in the stocks of borrowing firms around the loan deal initiation (informed traders) with the fraction of volume generated by the average affiliated and other unaffiliated funds outside this window (uninformed traders). In unreported results, we find that the median informed trader generates, on average, up to 10 times more trading volume than the median uninformed trader in buys. This gives an idea of how privileged information on borrowing firms' prospects gets impounded into these firms' share prices around the deal.

All these results support the working hypothesis that affiliated funds change their holdings in the stocks of firms borrowing from affiliated banks on the basis of privileged insider information. Stocks in which affiliated funds increase their holdings based on more private information tend to do better than stocks in which funds increase their holdings based on less private information. Funds that do not belong to these conglomerates do not have access to this information and, therefore, do not display any discernible change in their holdings of borrowing firms. Overall, the results provide further support for H2 and indicate that the trading strategies of affiliated funds rely on privileged inside information not replicable by outside funds.

6. Formal or informal information flow?

The question that arises now is whether fund managers receive this information in a coordinated manner or whether this is just an informal flow of information among employees working for the same organization. The first possibility refers to the case in which the conglomerate centrally plans the transfer of information and directly coordinates the activities of the lending and investment arms. The second possibility refers to the situation in which fund managers exploit the information they derive from their personal acquaintance with the bank managers. This would be the case if the bank and the mutual funds were located within a close distance. Therefore, by testing whether the increase in holdings in the stocks of borrowing firms is more pronounced for funds located close to their affiliated banks, we can better understand the channel through which this privileged information might flow.

For this purpose, we compute the distance between the affiliated funds and their affiliated bank headquarters. The location of the bank's headquarters is obtained either from the *Federal Reserve Report of Condition and Income* (or *Call Reports*), the *Federal Deposit Insurance Corporation* (*FDIC*) *Institution Directory*, or the Bureau van Dijk BankScope database. To obtain the location of the funds, we use the Nelson Directory of Investment Managers and then determine the corresponding value of latitude and longitude using the Geographic Names Information System (GNIS) of the US Geological Survey. Once latitudes and longitudes are in place for funds, i, and their affiliated banks, j, we calculate the kilometric distance between the two using

$$d_{i,j} = \arccos(deg_{latlon}) \times \frac{2\pi r}{360}, \tag{4}$$

where

$$\begin{aligned} deg_{latlon} = {} & \cos(lat_i)\cos(lon_i)\cos(lat_j)\cos(lon_j) \\ & + \cos(lat_i)\sin(lon_i)\cos(lat_j)\sin(lon_j) \\ & + \sin(lat_i)\sin(lat_j) \end{aligned} \tag{5}$$

and *lat* and *lon* are fund and bank latitudes and longitudes and r is the Earth's radius. In this way, we are able to calculate the distance between each fund and its affiliated bank. Summary statistics reveal that this distance ranges between 1.06 km and 4,336 km with a mean (median) distance of 725 (10) km. Because informal information flows are more likely to take place between funds and banks located in close proximity, we classify the affiliated funds into Short Distance and Long Distance categories around the median distance of 10 km. Regressions analogous to Eq. (1) are performed for each category using five control funds for each affiliated fund.

The results are reported in Table 7. Columns 1–3 present the results for Short Distance, and Columns 4–6 present those for Long Distance. They show that only the affiliated funds located close to their bank's headquarters increase their holdings in the stocks of borrowing firms in a more significant manner than their controls. The change in the holdings of affiliated funds located far away from their lending banks is not significantly different from that of their controls. These results suggest that knowledge transfers between different firm divisions of the same financial conglomerate tend to be informal in nature. The economic magnitudes are also relevant. Using five control funds, we find that the coefficient for the Lending Conglomerate Dummy is 0.0038% for the Short Distance category. Given that the average holdings increase for all control funds in the borrowing stocks in this category is 0.0013%, this implies that affiliated funds located close to their affiliated banks increase their holdings in the stocks of borrowing firms by 279% more than their respective controls. The equivalent figure for funds located in the Long Distance category is only 12%, which is insignificantly different from zero.

These findings show that funds located close to their affiliated banks benefit from the information flow about the lending activity of their affiliated banks, while funds located further away do not. They suggest that personal

Table 7
Change in holdings of borrowing stocks around deal date—conditioning on distance between funds and lending banks

We compare the changes in holdings of mutual funds in the stocks of borrowing firms while conditioning on the distance between the funds belonging to lending conglomerates and their respective banks. Funds located within 10 km of their lending affiliated bank have been classified as short distance while the rest have been classified as long distance. In each case, the change in holdings of affiliated funds is compared with the change in holdings of control funds. Affiliated funds and control funds are defined as above. We estimate

$$\Delta H_{f,i,d} = \alpha + \beta\ Lending\ Conglomerate\ Dummy_{f,i,d} + \lambda\ Affiliation\ Dummy_{f} + \gamma\ Controls_{f,i,d} + \varepsilon_{f,i,d}.$$

$\Delta H_{f,i,d}$ is the change in the holdings of fund f in the stock of borrowing firm i around loan deal d. The change in holdings in both borrowing and control stocks is measured by subtracting the average percentage stock holding during the 6 months before the deal from the average percentage stock holdings in the 6 months following the deal. Lending Conglomerate Dummy is equal to one if a mutual fund, f, belongs to a fund family that is part of a conglomerate involved in lending to firm i in deal d. Affiliation Dummy takes a value of one for all those funds that belong to families affiliated to banks, and Controls represent a vector of control variables made up of fund, family, and deal characteristics. $\Delta H_{f,i,d}$ is measured as before and is defined in percentage terms. Columns 1–3 (4–6) compare the change in holdings of affiliated funds located at short (long) distance with those of the five closest control funds. Control funds for each affiliated fund are identified on a yearly basis using investment objective, total net assets of the fund, total net assets of the fund family, and fund return over the previous year. A borrowing firm is defined as a firm borrowing from a bank that is part of a conglomerate containing a fund family. The observations are at the fund-stock deal level. All regressions include style dummies defined at the level of the investment objective category as well as year dummies. Absolute values of the t-statistics appear in parentheses. ****, **, And * denote significance levels of 1%, 5%, and 10%, respectively, using heteroskedasticity robust standard errors.

Explanatory variable	Short distance			Long distance		
	(1)	(2)	(3)	(4)	(5)	(6)
Lending Conglomerate Dummy	0.0038***	0.0038***	0.0038**	0.0002	0.0002	0.0002
	(2.94)	(2.61)	(2.05)	(0.39)	(0.23)	(0.12)
Affiliation Dummy	0.0003	0.0003	0.0003	0.0012**	0.0012**	0.0012**
	(0.45)	(0.38)	(0.35)	(2.45)	(2.10)	(2.30)
Lag Annual Return	0.0014	0.0014	0.0014	0.0027***	0.0027***	0.0027***
	(0.70)	(0.69)	(0.70)	(2.72)	(2.59)	(2.80)
Total Net Assets (Fund)	0.0004	0.0004	0.0004	0.0005**	0.0005*	0.0005
	(1.00)	(0.88)	(1.13)	(2.26)	(1.87)	(1.44)
Total Net Assets (Family)	0.0001	0.0001	0.0001	−0.0001	−0.0001	−0.0001
	(0.57)	(0.54)	(0.55)	(1.20)	(1.02)	(0.83)
Turnover	−0.0001	−0.0001	−0.0001	−0.0001	−0.0001	−0.0001
	(0.13)	(0.13)	(0.14)	(0.18)	(0.16)	(0.15)
Total Fees	−0.0003	−0.0003	−0.0003	−0.0002	−0.0002	−0.0002
	(0.76)	(0.66)	(0.64)	(0.50)	(0.46)	(0.50)
Change in Total Net Assets	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.66)	(0.59)	(0.57)	(1.06)	(1.02)	(0.95)
Number of Lending Banks	−0.0007**	−0.0007**	−0.0007	0.0002	0.0002	0.0002
	(2.24)	(2.07)	(1.44)	(0.91)	(0.93)	(0.89)
Intercept	0.0066	0.0066	0.0066	−0.0029	−0.0029	−0.0029
	(1.61)	(1.61)	(1.22)	(1.28)	(1.26)	(1.41)
Clustering	None	Fund	Family	None	Fund	Family
Style dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.01	0.01	0.01	0.002	0.002	0.002
Number of observations	25,922	25,922	25,922	35,594	35,594	35,594

contacts are the main channel through which information flows between the banks and their affiliated funds. Financial conglomerates do not collect and disperse this information in a coordinated manner.

These results also help to shed light on how financial conglomerates compensate commercial bankers for leaking the information to their asset management arms. Given that the nature of the information transfer seems to be mostly informal (i.e., possibly due to personal acquaintances between the bankers and portfolio managers) it would be hard to imagine that a formal scheme exists of financial rewards for the bankers who leak information to portfolio managers.

In unreported tests, we also condition our tests of changes in fund holdings on the location of the borrowing firm. Borrowing firms could be located close to both the lending bank as well as the affiliated funds, in which case affiliated funds could acquire their own proprietary information about the prospects of these firms without having to obtain this information from their lending arms. We find that the location of the firm is not relevant. Significant changes in holdings are only observed for those affiliated funds that are located close to their lending banks, regardless of the location of the borrowing firms. These results support our original finding of informal information flow between the lending and asset management arms given that personal acquaintances would be easier to cultivate within such families.

7. Discussion

The previous findings show that inside information generates significant gains. The monthly abnormal returns

amount to annualized returns of 20%. This can be explained by the fact that we focus on trades that are more likely to have a higher information content. We focus on the changes in holdings of lead banks that are, by definition, supposed to have more information about the borrowing firms. Moreover, by excluding repeat borrowers, we focus exclusively on those deals that are most likely to generate significant privileged information about the borrower. Both these cuts help us to isolate instances in which the banks gain significant information from the borrowing firms and increase our chances of capturing trades that are rich in information. These returns are also not much different from strategies that simply rely on publicly available information, such as repurchases, earnings announcements, etc., which can yield returns amounting to 10–12% per annum. In this respect, a strategy that conditions on inside information can easily yield more.

The fact that we also find that the frequency of informed trading around the borrowing event is much higher than the frequency of uninformed trading suggests that one of the drivers of these higher returns is the trades of the affiliated funds themselves signaling information to the market. The fact that performance is short-lived is also consistent with this and suggests that affiliated funds behave as classic insiders that reap the benefits of inside information and, at the same time, affect the prices themselves. This provides an informational benefit as more information is revealed, but, at the same time, could reduce the liquidity of the stocks due to the asymmetric information problem created by the existence of insiders.

How widespread is this phenomenon? To address this issue, we look at the characteristics of those mutual fund families in which such information transfers are observed. We condition separately on four distinct family characteristics of these affiliated funds: family TNA, number of funds in the family, average age of the fund family, and average performance of the family in the previous year. Family TNA is the total TNA of all the individual funds belonging to the fund family. Number of funds measures the total number of distinct funds in the fund family. Family age is defined as the average age of each fund belonging to the fund family. Family performance is computed by first calculating the net-of-style lagged average annual return for each fund in the family and then calculating the average of this excess return at the family level.

We estimate regressions analogous to Eq. (1). The results are shown in Table 8. These results show that

Table 8
Information Flow between affiliated funds and lending banks—conditioning on family characteristics

This table compares the change in holdings of borrowing stocks by affiliated funds and control funds while conditioning separately on four distinct family characteristics of these affiliated funds: family total net assets (TNA), number of funds in the family, average age, and average performance. Columns 1 and 2 condition on family TNA of affiliated fund families (defined as the sum of the TNA of each fund belonging to the family). Columns 3 and 4 condition on the number of funds in the fund family. Columns 5 and 6 condition on the average age of affiliated fund families (defined as the average of the age of each fund belonging to the family). Columns 7 and 8 condition on the average performance of affiliated families. This is computed by first calculating the net-of-style lagged average annual return for each fund in the family and then calculating the average of this excess return at the family level. In the case of each family characteristic, families are separated into the two distinct above-mentioned groups on the basis of annual median characteristics. All the other regression specifications are as defined above.

Explanatory variable	Family TNA		Number of Funds		Family Age		Family Performance	
	Small (1)	Big (2)	Few (3)	Many (4)	Young (5)	Old (6)	Poor (7)	Good (8)
Lending Conglomerate Dummy	0.0062**	−0.0003	0.0055**	0.0003	0.0045**	0.0016	0.0035**	0.0025*
	(2.58)	(0.25)	(2.40)	(0.25)	(2.04)	(0.81)	(1.99)	(1.67)
Affiliation Dummy	−0.0003	0.0001	0.0001	−0.0001	0.0004	−0.0001	−0.0005	0.0007
	(0.35)	(0.26)	(0.16)	(0.10)	(0.61)	(0.27)	(0.77)	(1.38)
Lag Annual Return	0.0010	0.0011	0.00001	0.0025***	0.0017	0.0012	−0.0001	0.0027**
	(0.66)	(1.02)	(0.01)	(2.60)	(1.19)	(0.96)	(0.09)	(2.18)
Total Net Assets (Fund)	0.0010***	0.0007***	0.0012***	0.0006***	0.0008***	0.0011***	0.0006**	0.0012***
	(3.18)	(4.28)	(3.86)	(3.76)	(2.97)	(4.77)	(2.04)	(5.73)
Total Net Assets (Family)	0.0001	0.0001	−0.00001	0.0001	−0.0001	−0.0001	0.0003	−0.0004**
	(0.28)	(1.12)	(0.14)	(1.17)	(0.70)	(0.30)	(1.42)	(1.99)
Turnover	0.00001	0.0007**	0.00001	0.0006**	0.0003	0.0005	0.0004	0.0003
	(0.03)	(1.96)	(0.10)	(1.79)	(0.72)	(1.17)	(0.99)	(1.25)
Total Fees	0.0001	−0.0001	−0.00001	0.0001	−0.0001	−0.0001	0.0001	−0.0002
	(0.18)	(0.42)	(0.13)	(0.62)	(0.31)	(0.29)	(0.27)	(0.82)
Change in Total Net Assets	0.00001	0.0001*	0.0001	0.0001	0.00001	0.0002**	0.0002***	−0.0001
	(0.46)	(1.96)	(0.92)	(1.56)	(0.10)	(2.00)	(2.62)	(0.89)
Number of Lending Banks	−0.0006**	−0.0001	−0.0003	−0.0005	−0.0006*	−0.0003	−0.0004	−0.0004*
	(1.98)	(0.37)	(1.46)	(1.42)	(1.71)	(1.53)	(1.08)	(1.90)
Intercept	0.0007	−0.0029	0.0025	−0.0038*	0.0028	−0.0011	0.0026	−0.0016
	(0.22)	(1.61)	(0.78)	(1.72)	(0.94)	(0.39)	(0.91)	(0.79)
Clustering	Family	Family	Family	Family	Family	Family	Family	Family
Style dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.005	0.01	0.005	0.01	0.01	0.01	0.01	0.01
Number of observations	32,362	32,646	32,059	32,949	30,272	34,736	31,802	33,206

information transfer occurs in small families, young families, and families that have experienced poor net-of-style average performance during the previous year. For example, Columns 1 and 2 compare information transfers within small and large fund families, respectively. Lending Conglomerate Dummy turns out to be significant in Column 1 only. Likewise, Columns 3 and 4 compare information transfers based on number of funds in the family, Columns 5 and 6 compare these based family age, and Columns 7 and 8 present results based on family performance.

Therefore, overall, our evidence shows that the information sharing occurs through informal personal channels in young, small, and poorly performing fund families. This implies that the insider trading phenomenon, while significant, is not widespread and does not occur as a coordinated family-wide activity.

What are the main policy implications? Chinese walls have been designed to wall in information obtained from one department and prevent this inside information from being disseminated throughout the firm. Chinese walls were initially voluntary policies established by broker-dealers themselves, but the SEC eventually made them a statutory requirement for all firms. Section 15(f) of the Securities Exchange Act of 1934, which was adopted as part of the Insider Trading and Securities Fraud Enforcement Act of 1988, states that "[e]very registered broker or dealer shall establish, maintain and enforce written policies and procedures reasonably designed … to prevent the misuse … of material, nonpublic information."

Originally, Chinese walls were meant to prevent investment bankers from exerting influence on analysts' research reports and to physically segregate the investment banking department from the brokerage, research, and other departments of the firm. However, they were not designed to separate the commercial lending from the investment activity. The repeal of the Glass-Steagal Act and appearance of new intermediaries in the lending markets (e.g., hedge funds) that directly take positions in the equity market have compounded the problem. One element that has helped to address the issue is the position of the Loan Syndications and Trading Association. Attention has been drawn to the potential misuse of nonpublic financial information gathered by hedge funds in their loan market activities and used in connection with their securities market activities. Moreover, the passage of the Regulation Fair Disclosure in year 2000, by affecting the possibility for firms to selectively pass along information to lending institutions, could have also changed the scope of action of the affiliated fund managers.

8. Conclusion

We study the effects of housing lending and asset management arms under the same roof. We test how affiliation with a financial group that also contains a bank affects the portfolio allocation and portfolio performance of a fund.

We show that mutual funds and families affiliated with banks increase their stock holdings in firms borrowing from these banks around the initiation of the deal by greater amounts than other unaffiliated funds and fund families. This strategy is information-driven. The performance of the positions of affiliated funds in the stocks of borrowing firms is superior to the performance of these funds' positions in other nonborrowing stocks located in the same industry as well as to that of other similar stocks matched on industry, size, and market-to-book ratio. The extra-performance is due to privileged inside information, which is not replicable by nonaffiliated funds. We show that this behavior is mostly concentrated in young, small, and poorly performing fund families. It takes place prevalently for funds located in close geographic proximity to their lending banks. Our evidence points to information flows within conglomerates through informal channels such as personal acquaintances.

Appendix

Variable definitions are given in Table A1.

Table A1
Variable definitions

Variable name	Database used	Data items used	Definition
Panel A Definitions of mutual fund variables			
Lag Annual Return	Center For Research in Security Prices (CRSP) Mutual Funds	RET	Gross return for the fund in the previous 12 months
Total Net Assets (Fund)	CRSP Mutual Funds	TNA	The Total Net Assets (TNA) (end-of-period) is the closing market value of securities owned, plus all assets, are minus all liabilities. TNAs are reported in millions of dollars.
Number of Funds in Family	CRSP Mutual Funds	ICDI, MGMT_NO	Total number of individual funds belonging to a particular fund family (MGMT_NO) in a particular month
Turnover	CRSP Mutual Funds	TURNOVER	Minimum of total purchases and total sales, standardized by the average TNA of the fund
Total Fees	CRSP Mutual Funds	EXPENSES, TOT_LOAD	Total Fees is the sum of EXPENSES and TOTAL LOAD, computed as EXPENSES+(1/7)*(TOTAL_LOAD) (See Sirri and Tufano, 1998). EXPENSES are defined as the percentage of the total investment that shareholders pay for the mutual fund's

Table A1 (*continued*)

Variable name	Database used	Data items used	Definition
			operating expenses (including 12b-1 Fees). TOTAL LOAD is the Total of All Maximum Front, Deferred, and Redemption Fees. It is a percentage total of loads applied to a fund.
Total Net Assets (Family)	CRSP Mutual Funds	TNA, MGMT_NO	Sum of the Total Net Asset values of the individual funds belonging to a particular fund family (MGMT_NO) in a particular month
Change in Total Net Assets (Funds)	CRSP Mutual Funds	TNA	Total Net Assets (TNA) at the end of the current year minus TNA at the end of the previous year (defined in millions of dollars)
Change in Total Net Assets (Family)	CRSP Mutual Funds	TNA, MGMT_NO	Total Net Assets (Family) at the end of the current year minus TNA (Family) at the end of the previous year
Fund Age	CRSP Mutual Funds	YEAR, F_DATE	Time in years since the mutual fund began trading (identified using F_DATE)
Investment Objective	CRSP Mutual Funds	ICDI_OBJ	A two-character code that identifies the fund's investment strategy as identified by Standard & Poor's Fund Services
Panel B Definitions of holding and deal-specific variables			
Fraction1	Spectrum Mutual Funds	SHARES, SHROUT1	The percentage of a firm's outstanding shares held by the fund at any particular time
ΔFraction1	Spectrum Mutual Funds	SHARES, SHROUT1, Deal Active Date	The percentage change in Fraction1 measured around the Deal Active Date. Average Fraction1 (in percentage) over the 6 months before the deal announcement is subtracted from the average Fraction1 (in percentage) over the 6 months after the deal announcement
Fraction2	Spectrum Mutual Funds	SHARES	The percentage of a firm's outstanding shares held by the fund out of all the shares being held by all the mutual funds at that time
ΔFraction2	Spectrum Mutual Funds	SHARES	The percentage change in Fraction2 measured around the Deal Active Date. Average Fraction2 (in percentage) over the 6 months before the deal announcement is subtracted from the average Fraction2 (in percentage) over the 6 months after the deal announcement
Lending Conglomerate Dummy	Dealscan, Spectrum Mutual Funds		Equals one if the mutual funds belong to a fund family that is affiliated to the lending bank and zero otherwise
Affiliation Dummy	Dealscan, Spectrum Mutual Funds		Equals one if the mutual funds belong to a fund family that is affiliated to any bank and zero otherwise
Deal Active Date	Dealscan	Deal Active Date	The launch date of a deal
Lead Arranger	Dealscan	Lead Arranger	Top tier lender(s) in a deal, responsible for arranging a loan syndication
Number of Lending Banks	Dealscan	Number of Lenders	Number of distinct lending banks involved in the deal
Deal Amount	Dealscan	Deal Amount	Total amount of the deal, all tranches included

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