Asset Management within Commercial Banking Groups: International Evidence

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ABSTRACT

We study the performance of equity mutual funds run by asset management divisions of commercial banking groups using a worldwide sample. We show that bank-affiliated funds underperform unaffiliated funds by 92 basis points per year. Consistent with conflicts of interest, the underperformance is more pronounced among those affiliated funds that overweight the stock of the bank's lending clients to a great extent. Divestitures of asset management divisions by banking groups support a causal interpretation of the results. Our findings suggest that affiliated fund managers support their lending divisions' operations to reduce career concerns at the expense of fund investors.

MUTUAL FUND COMPANIES MANAGE TRILLIONS of U.S. dollars worldwide, but many of these companies are not stand-alone entities. About 40% of mutual funds are run by asset management divisions of groups whose primary activity is commercial banking. This phenomenon is less prevalent in the United States (only 20% of mutual funds) as a result of the Glass-Steagall Act, which separated banking and asset management activities for many decades. Since the repeal of Glass-Steagall by the Gramm-Leach-Bliley Act in 1999, many U.S.

banking groups have begun to develop asset management divisions. Press reports indicate that bank-affiliated funds often underperform funds operated by independent fund management companies, particularly in Europe.[1] Yet, academic research has little to say about the potential spillover effects between commercial banking and asset management divisions.

When fund management companies are owned by commercial banking groups, fund managers may benefit the bank's lending business at the expense of fund investors (conflict of interest hypothesis).[2] Alternatively, the lending business may generate private information about borrowers via credit origination, monitoring, and renegotiation that is beneficial to the affiliated fund manager (information advantage hypothesis). A third possibility is that banking groups impose "Chinese walls" to prevent communication between the asset management and lending divisions, so that funds operate independently of other bank divisions (null hypothesis).

We test these hypotheses using a comprehensive sample of open-end equity mutual funds domiciled in 28 countries over the period 2000 to 2010. We focus on actively managed funds that invest in domestic equities because banks typically have stronger lending relationships with domestic firms. We define commercial bank-affiliated funds as those funds that belong to a management company that is either majority-owned by a commercial parent bank or part of a group that owns a commercial bank. The other management companies are classified as affiliated with investment banks or insurance companies or as unaffiliated companies.[3]

We find that, on average, commercial bank-affiliated funds underperform unaffiliated funds by about 92 basis points per year as measured by four-factor alphas. We obtain similar results when we use alternative measures of performance such as benchmark-adjusted returns, gross returns, or buy-and-hold returns. In addition, we find that affiliated funds underperform more when the ratio of outstanding loans to assets under management is higher, which is consistent with greater conflicts of interest. When we examine cross-country differences in the performance of affiliated funds, we find that "Chinese walls" between bank lending and asset management activities are more strictly enforced and fund investors' rights are better protected in common-law countries such as the United States (Khorana, Servaes, and Tufano (2005, 2009)). In the sample of U.S.-domiciled funds, we find less pronounced underperformance and no relation between performance and measures of conflicts of interest with the lending division.

To examine more directly whether the parent bank's lending activity is directly linked to fund underperformance, we measure the overlap between lending clients and fund stock holdings using the bank's activity in the syndicated

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[1] See Steve Johnson, "Bank-run funds are poor performers," *Financial Times*, January 9, 2011.

[2] See Mehran and Stulz (2007) for a review of the literature on conflicts of interest in financial institutions.

[3] We focus on the conflict of interest within commercial banking groups because net interest income represents the largest share of revenues among top banks worldwide.

loan market. A "client stock" is a firm that obtained a syndicated loan from the bank during the previous three years and whose shares are held in the portfolio of a fund affiliated with the bank. We show that bank-affiliated funds' portfolio holdings are biased toward client stocks over nonclient stocks. In addition, we find that bank-affiliated funds with higher portfolio exposure to client stocks (in excess of the portfolio weights in passive funds that track the same benchmark) tend to underperform more.

The endogeneity of the organizational form of a management company makes it difficult to identify a causal effect. The decision to operate a fund management company as bank affiliated may be related to unobserved fund characteristics that also explain the performance. We implement two empirical strategies to address this concern. First, we use fund fixed effects to control for time-invariant unobserved fund heterogeneity. The estimated underperformance of affiliated funds is even more pronounced in this case, which indicates that performance deteriorates after a fund switches from unaffiliated to bank-affiliated. Second, we exploit the exogenous variation generated by divestitures of asset management divisions by commercial banking groups during the 2000 to 2012 period as well as in the aftermath of the 2007 to 2009 financial crisis, when banks improved their regulatory capital ratios by divesting asset management units.[4] The evidence shows that funds that switch from affiliated to unaffiliated through divestiture subsequently reduce their holdings of client stocks and experience improved performance.

One remaining concern with our results is that bank-affiliated funds might hire less skilled fund managers. We examine the portfolio trading of affiliated funds using calendar-time portfolio returns. In these tests, we compare manager skill exclusively within affiliated funds on their holdings of client and nonclient stocks. We find that funds that overweight client stocks to a greater extend underperform in the trading of client stocks. However, these funds do not underperform in the trading of nonclient stocks. Moreover, funds that overweight client stocks to a lesser extent do not underperform in the trading of client stocks. These results do not support the skill hypothesis.

Why do commercial bank-affiliated funds exist in equilibrium if they perform more poorly? We try to understand the motivation of the different agents by providing evidence on the benefits that accrue to the parent bank and fund manager, as well as to the borrower. First, we show that banks use affiliated fund resources to build lending relationships with borrowers (Bharath et al. (2007, 2011), Ferreira and Matos (2012)). We find that banks are more likely to act as lead arrangers of future loans when they exert control over borrowers by holding shares through their asset management divisions; these holdings increase the probability of initiating a lending relationship and preserving a past lending relationship. Second, we find that fund managers that act as team players for their banking group by overweighting client stocks are less likely to lose jobs. This result suggests that career concerns help

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[4] See "Find management–Wasting assets," *The Economist*, January 18, 2009.

explain the fund managers' decisions to support the bank's interests. Third, we find that affiliated funds' portfolio holdings of client stocks are associated with less shareholder voting dissent on executive compensation proposals. This result is consistent with the idea that affiliated funds attempt to curry favor with the borrower's management in an effort to promote a lending relationship.[5] Finally, we find that, outside the United States, investors of affiliated funds exhibit inertia as the sensitivity of flows to poor past performance is insignificant. This result explains how affiliated funds may earn lower returns without suffering significant investor outflows and retain a significant market share.

Our work contributes to the literature examining agency conflicts in fund complexes in U.S. markets (Massa (2003), Nanda, Wang, and Zheng (2004), Gaspar, Massa, and Matos (2006), Cohen and Schmidt (2009)). Recent papers study the spillover effects between other businesses and asset management companies affiliated with financial groups. In the United States, Massa and Rehman (2008) find that bank-affiliated funds overweight lending client stocks around new loan announcements, a strategy that has a short-term positive effect on fund performance. This result is consistent with the information advantage hypothesis. Other authors, however, find evidence of conflicts of interest between investment banks' underwriting and asset management businesses (Ritter and Zhang (2007), Johnson and Marietta-Westberg (2009), Hao and Yan (2012), Berzins, Liu, and Trzcinka (2013)). More recently, Sialm and Tham (2016) document spillover effects across business segments of publicly traded fund management companies. Internationally, Golez and Marin (2015) show that Spanish bank-affiliated funds support the price of their own-parent stock, while Gil-Bazo, Hoffmann, and Mayordomo (2016) show that these funds supported parent banks' bond issues during the 2007 to 2009 financial crisis and the 2010 to 2012 European sovereign debt crisis. Ghosh, Kale, and Panchapagesan (2014) find conflicts of interest in business group-affiliated funds in India.

Our main contribution is to provide evidence of conflicts of interest between the lending and asset management divisions of commercial banking groups using an international sample of mutual funds where such conflicts are more prevalent than in the United States.

I. Hypotheses

The economics underlying our conflict of interest hypothesis is that the parent entity (a banking group) can be thought of as a multidivision business

[5] In a 2011 *Financial Times* article, Guillaume Prache, managing director of the European Federation of Investors, states that "Banks tend to double up their shares, combining the ones they hold directly with the proxy votes from shares owned by asset management arms. Banks invariably vote in ways that suit their commercial lending or investment banking arms, not in ways that reflect the interests of end investors." Ian Fraser, "Conflicts of interest a big issue for banks," *Financial Times*, May 22, 2011.

whose objective function is to maximize the combined revenue of all its divisions. While commercial banking operations derive value from lending relationships with their borrower clients, the asset management division receives revenues from fees on assets under management, which depend on attracting flows from end investors. The interest of the bank as creditor may conflict with that as equity holder via its affiliated funds. While fund managers have a fiduciary responsibility to fund investors, they are also employees of banking groups, for which revenues from lending usually dominate revenues from asset management. Thus, the fund manager's objectives are linked to both the size of assets under management and continued employment. As a result, instead of maximizing the risk-adjusted returns of fund investors, the fund manager may be asked to make portfolio decisions that benefit the parent bank's interests.[6] For example, the fund manager might overweight a lending client's stock to increase voting rights and help build long-term relationships that generate future loan business. Affiliated funds could also be used to temporarily support the stock price of the bank's lending clients even if doing so impairs fund performance to gain favor with the borrower's management. This argument predicts a negative effect on the performance of bank-affiliated funds. This leads to our first testable prediction:

HYPOTHESIS 1: *Commercial bank-affiliated funds underperform unaffiliated funds, as well as funds affiliated with other types of financial conglomerates (e.g., investment banks and insurance companies).*

The extent of the conflict of interest in a multidivision banking group depends on the relative size of the commercial banking and asset management divisions. If the commercial bank's balance sheet exposure (or loan interest income) dominates the assets (or revenues) from the asset management division, conflicts of interest are likely to be more pronounced. In particular, an affiliated fund's portfolio is likely to be tilted in favor of lending client's stocks. This is expected to be perceived favorably by the client firms, particularly if the affiliated funds help support their stock price. This leads to our second testable prediction:

HYPOTHESIS 2: *The underperformance of commercial bank-affiliated funds is increasing in the relative size of the lending division and the degree of overweighting of the bank's lending-client stocks.*

The information advantage hypothesis predicts that bank-affiliated fund managers overweight lending clients' stocks because they have private information on clients that is acquired through the banks' lending relationships. In this case, affiliated funds' trades on client stocks should be associated with outperformance. Alternatively, affiliated funds may attract less skilled managers, in which case fund manager trading should be associated with

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[6] Portfolio decisions are ultimately in the hands of fund managers. However, fund managers have incentives to minimize the likelihood that the bank faces financial distress, which could lead to salary cuts, layoffs, and liquidation of the asset management division.

underperformance for both client and nonclient stocks. We can empirically distinguish the conflict of interest hypothesis from these alternatives because it predicts that affiliated funds underperform rather than outperform, and that the underperformance is observed only in the trades of client stocks, not in the trades of nonclient stocks. This leads to our third testable prediction:

HYPOTHESIS 3: *The trades of a bank's lending client stocks explain the underperformance of commercial bank-affiliated funds: while managers of bank-affiliated funds show below-average skill in the trading of client stocks, they show average skill in the trading of nonclient stocks.*

For the overweighting of client stocks and the underperformance of bank-affiliated funds to exist in equilibrium, it must first be the case that the commercial bank sees a benefit from the affiliated funds' portfolio holdings of client stocks. We test this prediction by examining whether affiliated funds' holdings increase the probability that a bank retains or gains lending relationships. Second, it must be the case that the influence that comes from affiliated funds' holdings of client stocks generates benefits for the client's management. We test this prediction by examining whether clients' management benefits from less shareholder voting dissent on management proposals. We further test whether fund managers who overweight client stocks have a lower probability of job loss.[7] Finally, we test whether affiliated funds' investor clientele exhibits inertia, that is, does not react significantly to poor past fund performance. Unaffiliated fund providers may find it difficult to establish a distribution network in countries where banks have a strong presence.[8] In addition, banks have a competitive advantage in brand recognition, which allows them to cross-sell by offering mutual funds jointly with other financial products. This discussion leads to the following equilibrium prediction:

HYPOTHESIS 4: *The overweighting of a bank's client stocks by commercial bank-affiliated fund managers is an equilibrium outcome: (1) the bank benefits from repeated lending relationships, (2) the client's management benefits from friendlier voting at shareholder meetings, (3) affiliated fund managers benefit from lower job turnover, and (4) the flows of affiliated fund investors exhibit low sensitivity to poor past fund performance.*

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[7] Fund managers have limited career opportunities in countries where the asset management industry is dominated by banks and investors mainly rely on the advice of bank branches to select funds. Thus, bank-affiliated fund managers are viewed as bank employees and they have few incentives to build a track record.

[8] A similar argument explains the underperformance of broker-sold mutual funds in the United States, which could result from conflicts of interest between brokers and their clients or from substantial nontangible benefits offered by brokers (Bergstresser, Chalmers, and Tufano (2009), Del Guercio and Reuter (2014)). Christoffersen, Evans, and Musto (2013) document other biases in broker-intermediated funds.

II. Data

A. Sample of Equity Mutual Funds

Data on equity mutual funds come from the Lipper survivorship bias-free database, which covers many countries worldwide over the 1997 to 2010 period. Although multiple share classes are listed as separate observations in Lipper, they have the same holdings and the same returns before expenses. We therefore use the primary share class as our unit of observation and aggregate fund-level variables across different share classes. We exclude offshore funds (e.g., funds domiciled in Luxembourg or Dublin), funds-of-funds, and closed-end funds, which yields a sample of 29,872 open-end equity funds in 28 countries (18,918 funds that managed over $7.4 trillion as of December 2010).[9]

To classify a mutual fund as either affiliated or unaffiliated with a commercial bank, we first collect information on each fund's ultimate owner from the FactSet database. Specifically, we match each Lipper fund with the fund's portfolio holdings data in FactSet using ISIN and CUSIP fund identifiers as well as management company and fund names. This matching results in a sample of 16,245 funds (11,556 funds that managed $6.8 trillion as of December 2010). We then match the fund's ultimate parent obtained from FactSet with the ultimate owners of banks from the Bureau van Dijk's BankScope database. A fund is classified as affiliated with a commercial bank if (1) the fund's ultimate owner is a commercial bank (i.e., is classified by BankScope under Bank Holding & Holding Companies, Cooperative Bank, Commercial Bank, Savings Bank, or Specialized Governmental Credit Institution) with total assets of over $10 billion or (2) a commercial bank within the fund's ultimate owner group has total assets of over $10 billion.[10]

We also classify each fund as affiliated or unaffiliated with an investment bank or insurance company. We use the ultimate owner type from the BankScope and ISIS databases to identify fund management companies affiliated with insurance groups. Next, we use the top 20 banks in the Thomson Reuters Deal Analytics global equity league tables (by proceeds) for each year and region (Global, USA, EMEA, and Asia-Pacific) to identify management companies affiliated with investment banks.[11]

To illustrate our classification, funds managed by Wells Fargo Fund Management (the asset management arm of Wells Fargo & Co) and funds managed by DWS Investments (the asset management arm of Deutsche Bank) are

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[9] Ferreira et al. (2013) and Cremers et al. (2016) provide a detailed description of this data source. Lipper's worldwide data coverage is comprehensive compared to aggregate statistics from the Investment Company Institute (2011).

[10] For insurance groups, we consider only commercial bank subsidiaries with significant assets relative to the total assets of the group. For example, funds affiliated with Allianz SE are not considered commercial bank-affiliated.

[11] Funds can be classified in more than one category. For example, funds managed by DWS Investments (the asset management arm of Deutsche Bank) are classified as commercial bank-affiliated and investment bank-affiliated because Deutsche Bank is a universal banking group.

classified as commercial bank-affiliated. Funds managed by MFS Investment Management (the asset management arm of Sun Life Financial) and funds managed by Allianz Global Investors (the asset management arm of Allianz SE) are classified as insurance company-affiliated. Funds managed by Goldman Sachs Asset Management (the asset management arm of Goldman Sachs) and funds managed by Credit Suisse Funds (the asset management arm of Credit Suisse) are classified as investment bank-affiliated. Finally, funds managed by Fidelity Investments (parent company is FMR LLC) and funds managed by Schroders are classified as unaffiliated.

We focus on the conflict of interest with lending because this is the dominant activity of the top banks worldwide. For example, in 2010, the world's top 20 banks (as ranked by total assets) earned about 58% of their revenues from net interest income generated by loans (from BankScope). In contrast, investment banking fees (from Thomson Reuters) represent less than 4% of total revenues among the world's top banks. We conclude that most revenues for the banks in our sample are generated from interest income rather than underwriting and advisory services.

In our main tests, we focus on actively managed domestic funds (i.e., funds that invest in their local market) because banks typically have stronger lending relationships with domestic firms. The sample comprises 7,220 domestic equity funds in 28 countries over the 2000 to 2010 period. For robustness, we also perform placebo tests using international funds.

Table I presents the number and total net assets (TNA) of the domestic funds in our sample by country as of December 2010. Our sample contains 4,981 domestic funds that managed $3.6 trillion in assets in 2010. Domestic funds affiliated with a commercial banking group represent 32% of the number of funds and 18% of TNA. There is considerable variation in the market share of commercial bank-affiliated funds across countries. While bank-affiliated funds represent only 11% of TNA in the United States, they represent 40% outside the United States. Indeed, the market share of bank-affiliated funds exceeds 50% of TNA in the majority of European countries such as Germany, Italy, Spain, and Switzerland. Figure 1 shows the time series of the number and TNA of commercial bank-affiliated and unaffiliated funds. We see a downward trend in the market share of affiliated funds.

In Table IA.I in the Internet Appendix,[12] for each sample country, we list the top five fund management companies and indicate whether they are affiliated with a commercial bank. In the United States, none of the top five fund management companies are part of a commercial banking group, while in continental Europe, most of the top five companies are affiliated with a commercial bank.

B. Measuring Risk-Adjusted Performance

We estimate a fund's risk-adjusted returns (alphas) in U.S. dollars using the Carhart (1997) four-factor model. Following Bekaert, Hodrick, and Zhang

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[12] The Internet Appendix may be found in the online version of this article.

Table I
Sample of Commercial Bank-Affiliated Funds

This table presents number of funds, total net assets (TNAs), number of ultimate owners, percentage of commercial bank-affiliated funds, and number of parent (commercial) banks as of December 2010 for the sample of open-end actively managed domestic equity mutual funds and for the sample of domestic and international equity mutual funds (bottom of the table).

	Domestic Equity Funds			Commercial Bank-Affiliated Funds		
	Number of Funds	TNA ($ billion)	Number of Ultimate Owners	Number of Funds (%)	TNA (%)	Number of Parent Banks (%)
Australia	98	32.6	28	27.6	16.5	14.3
Austria	13	1.4	11	61.5	81.0	54.5
Belgium	23	1.7	8	73.9	78.6	50.0
Brazil	48	42.0	17	79.2	78.4	58.8
Canada	366	194.6	66	28.4	44.5	21.2
China	69	76.0	35	11.6	8.0	8.6
Denmark	22	3.1	15	54.5	70.0	46.7
Finland	28	5.5	14	71.4	89.8	50.0
France	180	42.2	48	48.9	57.8	27.1
Germany	47	34.8	20	51.1	71.7	45.0
India	242	37.4	31	18.6	17.7	25.8
Israel	37	0.8	15	2.7	1.8	6.7
Italy	30	4.5	15	60.0	55.0	60.0
Japan	515	36.6	43	45.6	36.8	30.2
Malaysia	91	6.4	20	62.6	92.3	45.0
Netherlands	12	4.3	7	66.7	69.9	57.1
Norway	58	15.7	15	58.6	60.2	46.7
Poland	29	5.8	15	58.6	71.0	53.3
Portugal	19	0.5	11	84.2	72.4	81.8
Singapore	13	1.6	10	61.5	28.6	50.0
South Africa	109	21.8	27	38.5	42.3	14.8
Spain	63	2.3	31	65.1	72.4	58.1
Sweden	101	63.2	20	71.3	77.1	40.0
Switzerland	77	20.7	31	55.8	52.1	32.3
Taiwan	147	10.2	31	43.5	26.8	35.5
Thailand	118	5.3	16	62.7	86.0	56.3
United Kingdom	406	215.3	90	17.7	18.0	14.4
United States	2,020	2,683.2	365	20.3	10.9	11.0
Total	4,981	3,569.7	831	32.2	18.1	18.2
Total (ex-U.S.)	2,961	886.5	513	40.3	39.8	25.7
	Domestic and International Equity Funds			Commercial Bank-Affiliated Funds		
Total	10,644	5,842.4	987	40.2	19.9	17.0
Total (ex-U.S.)	7,798	1,897.4	690	47.7	41.2	22.2

(2009), we estimate four-factor alphas using regional factors based on a fund's investment region in the case of domestic, foreign country, and regional funds. We use world factors in the case of global funds.[13]

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[13] We construct country-level factors using individual stock returns in U.S. dollars obtained from Datastream, closely following the method of Fama and French (1993). The regional and world factors are value-weighted averages of country factors. The regions are Asia Pacific, Europe, North America, Emerging, and World. Ferreira et al. (2013) provide a detailed description of the factors.
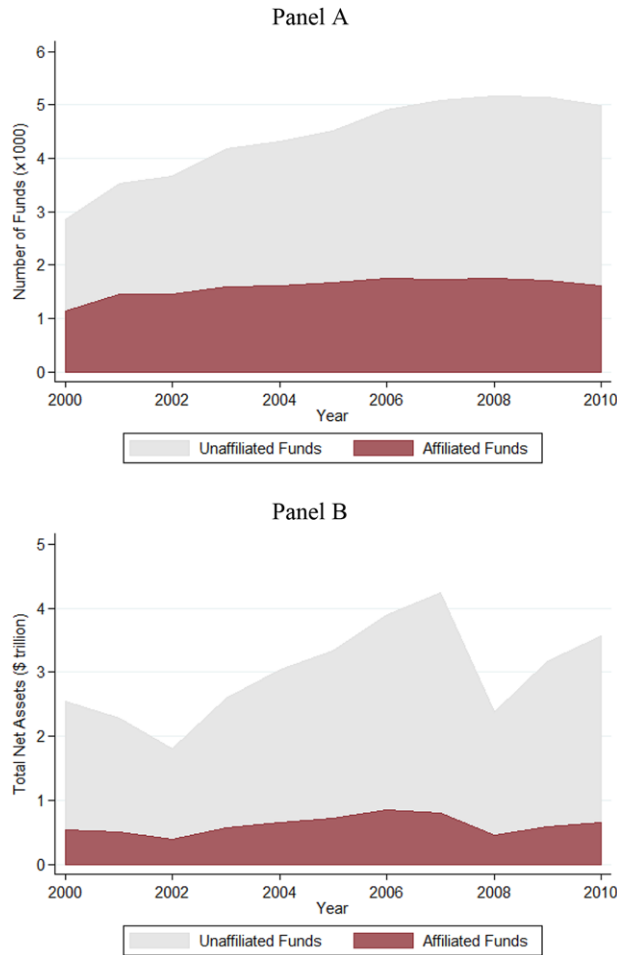
Figure 1. Market share of commercial bank-affiliated mutual funds. This figure shows the number of funds (Panel A) and total net assets (Panel B) of commercial bank-affiliated and unaffiliated mutual funds by year. A fund is classified as bank-affiliated if the ultimate owner of the fund's management company is a commercial banking group. The sample consists of actively managed domestic equity mutual funds over the 2000 to 2010 period. (Color figure can be viewed at wileyonlinelibrary.com)

For each fund-quarter, we estimate factor loadings using the previous 36 months of return data (we require a minimum of 24 months of return data),

$$R_{i,t} = \alpha_i + \beta_{1i}MKT_{i,t} + \beta_{2i}SMB_{i,t} + \beta_{3i}HML_{i,t} + \beta_{4i}MOM_{i,t} + \varepsilon_{i,t}, \qquad (1)$$

where $R_{i,t}$ is the return in U.S. dollars of fund i in month t in excess of the one-month U.S. Treasury bill rate, $MKT_{i,t}$ (market) is the excess return in the fund's investment region in month t, $SMB_{i,t}$ (small minus big) is the average return on the small-capitalization stock portfolio minus the average return on

the large-capitalization stock portfolio in the fund's investment region, $HML_{i,t}$ (high minus low) is the difference between the return on the portfolio with high book-to-market stocks and the return on the portfolio with low book-to-market stocks in the fund's investment region, and $MOM_{i,t}$ (momentum) is the difference between the return on the portfolio with the past 12-month stock winners and the return on the portfolio with the past 12-month stock losers in the fund's investment region. Using the estimated factor loadings, we subtract the expected return from the realized fund return to obtain the fund's abnormal return in each quarter (alpha). In robustness checks, we instead use benchmark-adjusted returns (i.e., the difference between the fund's return and the return on its benchmark), gross returns, buy-and-hold returns, and the information ratio (i.e., the ratio of the alpha to the standard deviation of the residuals).

C. Measuring Conflicts of Interest

We use several proxies for conflicts of interest within a commercial banking group based on the relative importance of the lending and asset management divisions. First, we use the ratio of the parent bank's total loans outstanding to the TNA managed by the asset management division (*Loans/TNA*).[14] Second, we use the ratio of the parent bank's corporate and commercial loans outstanding to the TNA (*Corporate Loans/TNA*). Finally, we use the ratio of the parent bank's interest income on loans to the total annual U.S. dollar value of the asset management division's fees (*Interest Income/Fees*).

To test the lending channel more directly, we use fund holdings data to examine whether the portfolio choices of bank-affiliated funds are biased toward lending client stocks. We obtain data on funds' portfolio holdings from the FactSet database.[15] We classify each fund's holdings as a client stock or nonclient stock using the DealScan database where we use all loans initiated between 1997 and 2010 with facility amounts above $25 million. A fund's stock holding is classified as a "client stock" if the fund's parent bank, subsidiary, or branch acted as a lead arranger for loans of the firm in the previous three years.

We construct several variables based on client stocks. First, we measure the fund's investment in client stocks as a percentage of TNA (*%TNA Invested in Client Stocks*). Second, we measure whether a bank-affiliated fund overweights client stocks compared to passive funds that track the same benchmark (*Bias in Client Stocks*). Finally, we account for the intensity of the bank-firm lending relationship by computing the prior two measures using only the holdings of the top 10 borrowers of the parent bank in terms of the total dollar amount

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[14] TNA is given by the sum of open-end actively managed domestic equity funds managed by the parent bank's asset management divisions. We obtain similar estimates when we use TNA across all funds.

[15] Ferreira and Matos (2008) provide a detailed description of this database.

of syndicated loans over the previous three years (*%TNA Invested in Top 10 Client Stocks*, *Bias in Top 10 Client Stocks*).

To better understand the classification of fund portfolio holdings as client or nonclient stocks, consider two funds (as of December 2010):

DWS Investa Fund				JPMorgan U.S. Equity Fund			
Ultimate Owner	Deutsche Bank AG			Ultimate Owner	JPMorgan Chase & Co.		
Management Company	DWS Investments			Management Company	JPMorgan Asset Mgmt.		
Country of Domicile	Germany			Country of Domicile	United States		
Fund Benchmark	DAX 30 TR			Fund Benchmark	S&P 500 TR		
Number of Holdings	43			Number of Holdings	217		
%TNA in Client Stocks	56.9			%TNA in Client Stocks	40.4		
Bias in Client Stocks (%)	17.1			Bias in Client Stocks (%)	7.2		

Top 5 Holdings:				Top 5 Holdings:			
Stock	Country	Client	Weight (%)	Stock	Country	Client	Weight (%)
BASF SE	Germany	Yes	10.92	Apple	United States	No	3.70
Siemens AG	Germany	Yes	9.81	Exxon Mobil	United States	Yes	2.51
Daimler AG	Germany	Yes	7.72	Microsoft	United States	Yes	2.42
E.ON SE	Germany	Yes	5.35	Procter & Gamble	United States	Yes	2.19
Allianz SE	Germany	No	4.46	Chevron	United States	No	2.07

The first of those funds is the DWS Investa Fund, which is managed by DWS Investments. Deutsche Bank acted as a lead arranger in the syndicated loan market over the 2008 to 2010 period for BASF, Siemens, Daimler, and E.ON, which are among the top five holdings of DWS Investa Fund. Overall, 56.9% of the fund's TNA is invested in client stocks, which corresponds to an overweight of 17.1 percentage points compared to passive funds that track the DAX 30 index.

The second example fund is the JPMorgan U.S. Equity Fund, which is managed by JPMorgan Asset Management. Three of its top five holdings are classified as client stocks for which JPMorgan acted as a lead arranger over the previous three years. Overall, 40.4% of the fund's TNA is invested in client stocks, which corresponds to an overweight of 7.2 percentage points compared to passive funds that track the S&P 500 index.

D. Summary Statistics

Panel A of Table II reports summary statistics for the *Commercial Bank-Affiliated*, *Publicly Traded Parent*, *Insurance-Affiliated*, and *Investment Bank-Affiliated* dummy variables, our conflict of interest variables (*Loans/TNA*, *Corporate Loans/TNA*, *Interest Income/Fees*, *%TNA Invested in Client Stocks*, *Bias in Client Stocks*), our risk-adjusted performance measure (*Four-Factor Alpha*), and the fund-level control variables (*TNA*, *Family TNA*, *Age*, *Total Expense*

Table II
Summary Statistics

Panels A and C present mean, median, standard deviation, 1ˢᵗ percentile, 99ᵗʰ percentile, and number of observations for each variable. Panel B presents mean and number of observations for the samples of unaffiliated funds and commercial bank-affiliated funds, and the corresponding mean difference *p*-value. The sample consists of actively managed domestic equity mutual funds over the 2000 to 2010 period.

Panel A: Fund Characteristics						
	Mean	Median	*SD*	1ˢᵗ Percentile	99ᵗʰ Percentile	Number of Observations
Commercial Bank-Affiliated	0.34	0.00	0.47	0.00	1.00	127,880
Publicly Traded Parent	0.64	1.00	0.48	0.00	1.00	127,880
Insurance-Affiliated	0.15	0.00	0.36	0.00	1.00	127,880
Investment Bank-Affiliated	0.22	0.00	0.42	0.00	1.00	127,880
Loans/TNA	36.22	0.00	428.03	0.00	548.92	126,782
Corporate Loans/TNA	26.53	0.00	253.28	0.00	445.74	126,673
Interest Income/Fees	106.56	0.00	792.31	0.00	1,677.93	110,641
%TNA Invested in Client Stocks	5.01	0.00	12.71	0.00	60.16	127,880
%TNA Invested in Top 10 Client Stocks	0.55	0.00	2.40	0.00	12.37	127,880
Bias in Client Stocks	2.01	0.00	7.25	−6.41	39.06	127,238
Bias in Top 10 Client Stocks	0.07	0.00	1.25	−3.14	3.97	127,238
Four-Factor Alpha (%)	0.25	−0.18	5.88	−15.34	19.05	127,880
Benchmark-Adjusted Return (%)	0.06	−0.09	4.18	−12.28	13.61	125,988
Gross-Four-Factor Alpha (%)	0.51	0.09	5.43	−13.73	18.45	116,554
Buy-and-Hold Benchmark Adj.-Return (%)	0.45	0.28	4.12	−12.36	14.78	123,174
Information Ratio	−0.038	−0.057	1.152	−2.825	2.852	127,880
TNA ($ million)	909	158	3,980	2	12,522	127,880
Family TNA ($ million)	35,581	5,501	104,401	15	588,055	127,880
Age (years)	12.46	9.25	11.16	2.33	59.25	127,880
Total Expense Ratio (%)	1.44	1.38	0.57	0.31	3.50	127,880
Total Load (%)	2.42	2.00	2.40	0.00	10.84	127,880
Flow (%)	0.61	−1.45	15.45	−33.70	69.92	127,880
Number of Countries of Sale	1.16	1.00	0.84	1.00	4.00	127,880
Team-Managed	0.61	1.00	0.49	0.00	1.00	127,880

(*Continued*)

Ratio, *Total Load*, *Flow*, *Number of Countries of Sale*, *Team-Managed*). Table A.I in the Appendix provides variable definitions.

Panel B of Table II reports the sample means of the variables separately for commercial bank-affiliated and unaffiliated funds, as well as univariate test results on the equality of the coefficients between the two groups. Panel C reports summary statistics on the proxies for conflicts of interest in bank-affiliated funds. The mean and median *Loans/TNA* and *Corporate Loans/TNA* well exceed one, indicating that banking groups' loan exposure is greater than their (equity) assets under management. In addition, on average, 14.7% of

Table II—*Continued*

Panel B: Unaffiliated and Commercial Bank-Affiliated Fund Characteristics

	Unaffiliated Funds		Commercial Bank-Affiliated Funds		
	Mean	Number of Observations	Mean	Number of Observations	Difference p-Value
Publicly Traded Parent	0.49	84,227	0.92	43,653	0.00
Insurance-Affiliated	0.21	84,227	0.04	43,653	0.00
Investment Bank-Affiliated	0.08	84,227	0.50	43,653	0.00
Four-Factor Alpha (%)	0.26	84,227	0.22	43,653	0.26
Benchmark-Adjusted Return (%)	0.11	83,189	−0.04	42,799	0.00
Gross-Four-Factor Alpha (%)	0.53	78,536	0.48	38,018	0.19
Buy-and-Hold Benchmark-Adj. Return (%)	0.49	81,481	0.38	41,693	0.00
Information Ratio	−0.037	84,227	−0.040	43,653	0.74
TNA ($ million)	1,122	84,227	499	43,653	0.00
Family TNA ($ million)	47,024	84,227	13,501	43,653	0.00
Age (years)	12.54	84,227	12.30	43,653	0.00
Total Expense Ratio (%)	1.44	84,227	1.45	43,653	0.04
Total Load (%)	2.52	84,227	2.24	43,653	0.00
Flow (%)	1.02	84,227	−0.17	43,653	0.00
Number of Countries of Sale	1.16	84,227	1.16	43,653	0.31
Team-Managed	0.59	84,227	0.65	43,653	0.00

Panel C: Commercial Bank-Affiliated Fund Characteristics

	Mean	Median	SD	1st Percentile	99th Percentile	Number of Observations
Loans/TNA	107.90	22.75	733.56	0.17	1,148.47	42,555
Corporate Loans/TNA	79.18	10.24	432.77	0.10	977.45	42,446
Interest Income/Fees	446.36	120.81	1,574.14	2.18	6,307.21	26,414
%TNA Invested in Client Stocks	14.69	6.61	18.21	0.00	69.28	43,653
%TNA Invested in Top 10 Client Stocks	1.60	0.00	3.90	0.00	18.49	43,653
Bias in Client Stocks	5.89	1.51	11.46	−12.69	51.55	43,400
Bias in Top 10 Client Stocks	0.22	0.00	2.13	−6.94	7.26	43,400

affiliated funds' holdings are in client stocks, which is 5.9 percentage points more than comparable passive funds hold in the same stocks.

Deutsche Bank is a good example of a commercial banking group with a large asset management division, DWS Investments. Deutsche Bank was the second-largest commercial bank worldwide in 2010, with total assets of over $2.5 trillion (outstanding loans of $545 billion), and second in the league table of syndicated loan arrangers in Europe, with $183 billion in 2008 to 2010. DWS is the largest fund management company in Germany and the third largest in Europe, with TNA of $90 billion in equity funds ($24 billion in domestic equity funds) in 2010. Thus, Deutsche Bank's lending business is several times the

size of its asset management business. When we examine fund holdings, we find that DWS's equity holdings show a strong bias toward client stocks, with 25% of TNA invested in client stocks compared to 15% for comparable passive funds.

III. Results

A. Baseline Test

We start by comparing the performance of management companies whose parent's primary activity is commercial banking and the performance of unaffiliated fund management companies. Specifically, we estimate fund-quarter panel regressions of four-factor alphas on the *Commercial Bank-Affiliated* dummy variable and a set of control variables (measured with a one-quarter lag). The regressions control for different types of affiliation by including the *Insurance-Affiliated* dummy variable for management companies that belong to insurance groups and the *Investment Bank-Affiliated* dummy variable for management companies that belong to investment banks. We also include the *Publicly Traded Parent* dummy to control for spillover effects associated with the listing of the parent company. The regressions further include quarter fixed effects and country-of-domicile fixed effects. Standard errors are clustered at the ultimate owner level.

The main results are reported in Panel A of Table III. Column (1) shows that commercial bank-affiliated funds underperform unaffiliated funds, as indicated by the negative and significant coefficient on the *Commercial Bank-Affiliated* dummy. The effect is economically significant: bank-affiliated funds underperform unaffiliated funds by 23 basis points per quarter (or 92 basis points per year). The results also show that affiliation with commercial banking groups is the most detrimental organizational arrangement for fund performance.

Insurance-affiliated funds' performance is in line with that of unaffiliated funds (i.e., the coefficient on the *Insurance-Affiliated* dummy variable is statistically insignificant). Funds affiliated with financial conglomerates with relevant commercial and investment banking activity underperform unaffiliated funds by about 12.5 ($-.125 = -0.231 + 0.106$) basis points per quarter. These findings on investment banks are consistent with conflicts of interest between the underwriting business and the asset management division (Hao and Yan (2012), Berzins, Liu, and Trzcinka (2013)).[16]

Fund management companies whose ultimate owners are publicly traded perform similarly to companies whose ultimate owners are privately held. The coefficients on the remaining control variables are in line with other studies that find performance is negatively related to fund size and the total expense ratio but positively related to family size and fund flows (e.g., Chen et al. (2004), Pástor, Stambaugh, and Taylor (2015)).

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[16] Most of the top investment banks (e.g., JP Morgan, Bank of America, Citigroup, Barclays Capital, BNP Paribas, and Deutsche Bank) are also part of a wider financial conglomerate that earns significant revenues from commercial banking.

Table III
Performance of Commercial Bank-Affiliated Funds

This table presents estimates of ordinary least squares (OLS) regressions of fund risk-adjusted performance. Panel A presents results in which the dependent variable is the alpha from the Carhart four-factor model in each quarter. Panel B presents results using alternative measures of risk-adjusted performance. *Commercial Bank-Affiliated* is a dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is a commercial banking group, and 0 otherwise. All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of actively managed domestic equity mutual funds over the 2000 to 2010 period. Robust *t*-statistics adjusted for clustering at the ultimate owner level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	\(1\)	\(2\)	\(3\)	\(4\)	\(5\)
		Panel A: Four-Factor Alpha			
Commercial Bank-Affiliated	−0.231***	−0.382**	−0.093	−0.121	0.126
	(−3.92)	(−2.35)	(−1.00)	(−1.35)	(0.63)
log (1+Loans/TNA)			−0.050**		
			(−2.14)		
log (1+Corporate Loans/TNA)				−0.051**	
				(−1.98)	
log (1+Interest Income/Fees)					−0.074**
					(−1.99)
Publicly Traded Parent	−0.002	−0.010	−0.006	−0.010	−0.004
	(−0.03)	(−0.05)	(−0.10)	(−0.17)	(−0.07)
Insurance-Affiliated	−0.055	−0.138	−0.062	−0.055	−0.057
	(−0.77)	(−0.52)	(−0.93)	(−0.81)	(−0.83)
Investment Bank-Affiliated	0.106*	0.172	0.103*	0.106*	0.146*
	(1.84)	(0.95)	(1.81)	(1.83)	(1.88)
log (TNA)	−0.052***	−0.617***	−0.054***	−0.054***	−0.045***
	(−4.82)	(−15.57)	(−4.94)	(−4.90)	(−3.82)
log (Family TNA)	0.041***	−0.097	0.040***	0.040***	0.040***
	(3.65)	(−1.24)	(3.47)	(3.51)	(3.15)
log (1+Age)	−0.030	−0.323*	−0.026	−0.025	−0.020
	(−1.09)	(−1.71)	(−0.93)	(−0.91)	(−0.69)
Total Expense Ratio	−0.035	−0.073	−0.035	−0.031	−0.010
	(−0.70)	(−0.47)	(−0.69)	(−0.62)	(−0.18)
Total Load	−0.022*	−0.021	−0.024**	−0.025**	−0.041***
	(−1.95)	(−0.49)	(−2.13)	(−2.14)	(−2.75)
Flow	0.007***	0.005***	0.007***	0.007***	0.007***
	(5.35)	(3.66)	(5.36)	(5.38)	(5.07)
Number of Countries of Sale	−0.002		−0.004	−0.004	0.002
	(−0.12)		(−0.19)	(−0.20)	(0.10)
Team-Managed	−0.105***		−0.107***	−0.107***	−0.088**
	(−2.65)		(−2.71)	(−2.71)	(−2.02)
Past Performance	0.026***	−0.017**	0.026***	0.026***	0.027***
	(3.78)	(−2.44)	(3.76)	(3.75)	(3.74)
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	Yes	Yes
Fund Fixed Effects	No	Yes	No	No	No

(*Continued*)

Table III—*Continued*

Panel A: Four-Factor Alpha

	(1)	(2)	(3)	(4)	(5)
Number of Observations	127,880	127,880	126,782	126,673	110,641
R^2	0.145	0.192	0.146	0.146	0.131

Panel B: Alternative Measures of Performance

	Benchmark-Adjusted Return (1)	Gross-Four-Factor Alpha (2)	Buy-and-Hold Benchmark-Adj. Return (3)	Information Ratio (4)
Commercial Bank-Affiliated	−0.198[***]	−0.219[***]	−0.167[***]	−0.048[***]
	(−3.75)	(−3.93)	(−3.33)	(−3.79)
Controls	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Fund Fixed Effects	No	No	No	No
Number of Observations	125,920	116,266	120,198	127,880
R^2	0.034	0.174	0.052	0.089

An important concern with our baseline results is potential endogeneity. We first address endogeneity concerns using fund fixed effects that control for unobserved sources of fund heterogeneity. This solves the joint determination problem whereby an unobserved time-invariant fund-level variable determines both performance and the decision to operate a fund management company in a commercial banking group. This test is equivalent to looking only at within-fund changes in the *Commercial Bank-Affiliated* dummy (i.e., divestitures or acquisitions of asset management divisions by commercial banking groups in which the other party is not a banking group).

Column (2) of Table III reports estimates of fund fixed effects regressions. The affiliated funds' underperformance gap relative to unaffiliated funds is 38 basis points per quarter, which is stronger than the estimate in column (1). The fund fixed effects specification indicates that fund performance improves after a switch from affiliated to unaffiliated, while fund performance deteriorates after a switch from unaffiliated to affiliated.

To investigate further why bank-affiliated funds underperform, we alternatively add to our baseline specification the logarithm of one plus *Loans/TNA*, *Corporate Loans/TNA*, or *Interest Income/Fees*, which measure the size of the lending division relative to the asset management division within a banking group. Columns (3) to (5) show negative and statistically significant coefficients on these three variables. Moreover, the coefficient on the *Commercial Bank-Affiliated* dummy becomes statistically insignificant, which suggests that most of the underperformance of affiliated funds is explained by the size of the lending business. The effect is economically significant. For example,

funds affiliated with commercial banks with lending divisions of relative size close to zero underperform unaffiliated funds by 9 basis points per quarter, while funds affiliated with commercial banks with lending divisions of median relative size (i.e., ratio of *Loans/TNA* of 22.75) underperform unaffiliated funds by 25 basis points.

Panel B reports estimates of the *Commercial Bank-Affiliated* coefficient using alternative measures of risk-adjusted performance. Column (1) shows that the results are robust to using benchmark-adjusted returns as an alternative to four-factor alphas—the extent of the underperformance remains practically unchanged at 20 basis points per quarter. Banks' larger foothold in fund distribution may allow affiliated funds to charge higher fees, which might be an alternative explanation for the underperformance of affiliated funds. Column (2) shows that bank-affiliated funds underperform unaffiliated funds when gross returns are used as the dependent variable, with the performance gap remaining virtually unchanged at 22 basis points per quarter. Thus, the ability of bank-affiliated funds to charge higher expense ratios does not explain their underperformance. In column (3), we consider funds' buy-and-hold return in excess of the benchmark return, as the performance gap could come from higher loads, wrap fees, or other hidden costs. We find that bank-affiliated funds underperform unaffiliated funds by a similar difference of 17 basis points per quarter. Finally, in column (4), we account for differences in idiosyncratic risk across funds using the information ratio as a performance measure. The idea here is that, as a portfolio deviates from the benchmark, it will be exposed to greater idiosyncratic risk. The results are robust to using the information ratio as a performance measure.

We also explore the time-series variation of our results by analyzing the bank-affiliated funds' performance gap in market downturns as proxied by (1) a dummy variable that takes a value of 1 in bear markets (2000:Q1 to 2002:Q3 and 2007:Q4 to 2009:Q1), (2) the market return of a fund's investment region (Asia Pacific, Europe, North America, and Emerging), and (3) a dummy variable that takes a value of 1 during NBER recessions periods (any quarter that includes at least one month classified as a recession month). The estimates in Table IA.II in the Internet Appendix show that the underperformance of affiliated funds is more pronounced during market downturns when we expect a bank's balance sheet to suffer from deterioration in the valuation of borrower firms.

B. Cross-Country Variation

Our sample of funds domiciled in 28 countries allows us to examine cross-country differences in the performance of commercial bank-affiliated funds. We consider several country characteristics that can help explain the underperformance of affiliated funds. Table IV reports the results. First, we compare the underperformance of affiliated funds in the United States relative to other countries. The intuition is that "Chinese walls" between bank lending and asset management are more strictly enforced in the United States because of

Table IV
Performance of Commercial Bank-Affiliated Funds: Cross-Country Differences

This table presents estimates of ordinary least squares (OLS) regressions of fund risk-adjusted performance. The dependent variable is the alpha from the Carhart four-factor model in each quarter. *Commercial Bank-Affiliated* is a dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is a commercial banking group, and 0 otherwise. In columns (1) and (2), the non-U.S. and U.S. fund groups consist of those funds domiciled outside of the United States and domiciled in the United States. In columns (3) and (4), the civil and common-law fund groups consist of those funds domiciled in civil-law and common-law countries as defined in La Porta et al. (1998). In columns (5) and (6), the bank- and market-based fund groups consist of those funds domiciled in bank- and market-based countries as defined in Demirgüç-Kunt and Levine (2001). In columns (7) and (8), the high and low bank concentration groups consist of those funds domiciled in countries that are above and below the 75th percentile of the distribution of the market share of the top five banks. In columns (9) and (10), the high- and low-fund management company concentration groups consist of those funds domiciled in countries that are above and below the 75th percentile of the distribution of the market share of the top five fund management companies. In columns (11) and (12), the low and high approvals fund groups consist of those funds domiciled in countries that have one and more than one regulatory approval and disclosure requirements in the fund industry as defined in Khorana, Servaes, and Tufano (2005). The regressions include the same control variables (coefficients not shown) as in Table III. All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of actively managed domestic equity mutual funds over the 2000 to 2010 period. Robust *t*-statistics adjusted for clustering at the ultimate owner level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Country of Domicile		Legal Origin	
	Non-U.S. Funds (1)	U.S. Funds (2)	Civil Law (3)	Common Law (4)
Commercial Bank-Affiliated	-0.332^{***}	-0.165^{**}	-0.322^{***}	-0.185^{***}
	(-3.49)	(-2.55)	(-2.69)	(-2.83)
Controls	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	Yes
Number of Observations	50,864	77,016	24,723	103,157
R^2	0.088	0.246	0.147	0.167

	Financial System		Banking Industry	
	Bank Based (5)	Market Based (6)	High Concentration (7)	Low Concentration (8)
Commercial Bank-Affiliated	-0.307^{**}	-0.197^{***}	-0.405^{***}	-0.199^{***}
	(-2.12)	(-3.18)	(-3.60)	(-3.13)
Controls	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	Yes
Number of Observations	22,250	105,630	31,821	96,059
R^2	0.136	0.182	0.117	0.191

(*Continued*)

Table IV—*Continued*

	Mutual Fund Industry		Approvals	
	High Con-centration (9)	Low Con-centration (10)	Low (11)	High (12)
Commercial Bank-Affiliated	−0.325**	−0.168***	−0.309**	−0.226***
	(−2.56)	(−2.80)	(−2.42)	(−3.53)
Controls	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	Yes	Yes
Number of Observations	32,094	95,786	28,234	99,646
R^2	0.150	0.199	0.095	0.185

the legacy effect of the Glass-Steagal Act, and hence fund investors' rights are better protected (Khorana, Servaes, and Tufano (2005, 2009)). In columns (1) and (2), we find much less pronounced underperformance among U.S.-affiliated funds (17 basis points per quarter) than among non-U.S. affiliated funds (33 basis points per quarter). This performance difference is statistically significant.

Second, we compare the performance gap of affiliated funds in countries with civil-law legal origin versus countries with common-law legal origin (La Porta et al. (1998)). In columns (3) and (4) of Table IV, we find that the underperformance of affiliated funds is more pronounced in civil-law countries (32 basis points per quarter) than in common-law countries (19 basis points per quarter). Taken together, the non-U.S. versus U.S. results as well as the legal origin results suggest that conflicts of interest are less pronounced in markets with stronger laws and regulations.

Third, we compare the performance gap of affiliated funds in countries with bank-based financial systems versus countries with market-based financial systems (Demirgüç-Kunt and Levine (2001)). The conflicts of interest between lending and asset management divisions should be exacerbated in countries where firms are more bank-dependent and rely less on markets to raise capital. In columns (5) and (6), we find that the underperformance of affiliated funds is more pronounced in bank-based countries (31 basis points per quarter) than in market-based countries (20 basis points per quarter).

Fourth, we compare the performance gap of affiliated funds in countries with low versus high banking industry concentration as proxied by the market share of the top five banks (Beck, Demirgüç-Kunt, and Levine (2000)). We expect that conflicts of interest are more pronounced in countries with higher banking concentration. In columns (7) and (8), we find that the underperformance of affiliated funds is more pronounced in the high banking industry concentration group (41 basis points per quarter) than in the low banking industry concentration group (20 basis points per quarter). This performance difference is statistically significant.

Fifth, we compare the performance gap of affiliated funds in countries with low versus high mutual fund industry concentration as proxied by the market

share of the top five fund management companies. In columns (9) and (10), we find that the underperformance of affiliated funds is more pronounced in the high concentration group (33 basis points per quarter) than in the low concentration group (17 basis points per quarter), with the difference statistically significant.

Finally, we compare the performance gap of affiliated funds in countries with low versus high requirements with regard to regulatory approvals and disclosure (*Approvals*) in the fund industry (Khorana, Servaes, and Tufano (2005)). In columns (11) and (12) of Table IV, we find that the underperformance of affiliated funds is more pronounced in the low *Approvals* group (31 basis points per quarter) than in the high *Approvals* group (23 basis points per quarter).

Overall, the results suggest that better investor protection, a stricter regulatory environment, and more intense competition in the banking and mutual fund industry mitigate conflicts of interest between the lending and asset management divisions of commercial banking groups.

C. Client Stock Overweighting

We use fund portfolio holdings data to test more directly whether fund manager investment decisions favor the parent bank's lending business over fund investors' interests. In particular, we examine the cost of the portfolio's exposure to lending-client stocks.

Panel C of Table II shows that bank-affiliated funds hold on average 14.7% of the fund's TNA in client stocks (*%TNA Invested in Client Stocks*). In comparison, the average weight in the same stocks among passive funds that track the same benchmark is 8.8%. This corresponds to a 5.9 percentage point overweight of client stocks by affiliated funds relative to comparable passive funds (*Bias in Client Stocks*). The overweight in client stocks is 0.22 percentage points when we consider the top 10 borrowers of the fund's parent bank (*Bias in Top 10 Client Stocks*).[17]

The fact that fund managers' allocations are biased toward client stocks does not necessarily imply that these portfolio choices are detrimental to performance, as funds might have access to private information obtained from the parent's bank lending business. To test whether the conflict of interest hypothesis or the information advantage hypothesis dominates, we estimate our baseline regressions of fund performance using measures based on portfolio holdings.

We use four dummy variables to capture the extent to which a fund's holdings overweight client stocks. We define *High Allocation Fund* as a dummy that takes a value of 1 if the fund's *%TNA Invested in Client Stocks* is above the median in each country and quarter, and *High Bias Fund* as a dummy that takes a value of 1 if the fund's *Bias in Client Stocks* is above the median in each country

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[17] Table IA.III in the Internet Appendix shows that affiliated funds overweight client stocks using fund-stock-quarter regression tests.

and quarter. We similarly define two dummy variables *High Allocation Fund in Top 10 Client Stocks* and *High Bias Fund in Top 10 Client Stocks* based on holdings in the top 10 clients. In the regressions, the coefficient on *Commercial Bank-Affiliated* is an estimate of the difference in the performance between funds with low exposure to client stocks and unaffiliated funds. Similarly, the coefficients on *High Allocation Fund* and *High Bias Fund* provide estimates of the difference in the performance between funds with high exposure to client stocks and funds with low exposure to client stocks, and therefore the degree to which fund performance is affected by conflicts of interest with the lending division.

Table V presents the results. Columns (1) and (2) show negative and statistically significant coefficients on the *High Bias Fund* and *High Bias Fund in Top 10 Client Stocks* dummy variables. The effects are also economically significant. For example, using the estimates in column (1), affiliated funds with low overweight of client stocks underperform unaffiliated funds by about 20 basis points per quarter. In addition, affiliated funds with high overweight of client stocks underperform affiliated funds with low overweight of client stocks by about 12 basis points, which indicates that they underperform unaffiliated funds by 32 basis points. These estimates therefore indicate that the exposure to client stocks represents about 40% of the underperformance of affiliated funds.

Columns (3) and (4) show negative and statistically significant coefficients on the *High Allocation Fund* and *High Allocation Fund in Top 10 Client Stocks* dummy variables. The effects are again economically significant. For example, affiliated funds with low exposure to client stocks underperform unaffiliated funds by 17.5 basis points per quarter. In addition, affiliated funds with high exposure to client stocks underperform affiliated funds with low exposure to client stocks by 16 basis points, which indicates that they underperform unaffiliated funds by 33.5 basis points.

We also compare the effect on fund performance of overweighting client stocks for the sample of non-U.S. funds and U.S. funds separately. Columns (5) and (6) present estimates using the *Commercial Bank-Affiliated* and *High Bias Fund* dummy variables. We find that the *High Bias Fund* coefficient is negative and significant in the sample of non-U.S. funds but statistically insignificant in the sample of U.S. funds. This is consistent with the idea that the underperformance of non-U.S. affiliated funds is related to the extent of the portfolio's tilt toward client stocks. For the sample of U.S. funds, however, the performance gap of commercial bank-affiliated funds is unrelated to the fund's exposure to client stocks.

Overall, the evidence indicates that commercial bank-affiliated funds with greater portfolio exposure and overweighting of client stocks tend to underperform more, which is line with the conflict of interest hypothesis.[18]

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[18] We also investigate whether affiliated funds would have performed better had they chosen to invest in other client stocks held by their peer funds (*Client Stocks Not Held*). The results in Table IA.IV in the Internet Appendix show that bank-affiliated funds are more biased toward

Table V
Performance of Commercial Bank-Affiliated Funds and Portfolio Allocation to Client Stocks

This table presents estimates of ordinary least squares (OLS) regressions of fund risk-adjusted performance. The dependent variable is the alpha from the Carhart four-factor model in each quarter. *Commercial Bank-Affiliated* is a dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is a commercial banking group, and 0 otherwise. *High Bias Fund* is a dummy variable that takes a value of 1 if an affiliated fund *Bias in Client Stocks* is above the median in a given country and quarter, and 0 otherwise. *Bias in Client Stocks* is the portfolio bias in stocks of firms that borrow from the fund's parent bank versus the average weight of comparable passive funds. *High Allocation Fund* is a dummy variable that takes a value of 1 if an affiliated fund *%TNA Invested in Client Stocks* is above the median in a given country and quarter, and 0 otherwise. *%TNA Invested in Client Stocks* is the percentage of TNA invested in stocks of firms that borrow from the fund's parent bank. *High Bias Fund in Top 10 Client Stocks* and *High Allocation Fund in Top 10 Client Stocks* are dummy variables similarly defined for the top 10 borrowers of the fund's parent bank. All of these variables are set to zero if the fund is unaffiliated. The regressions include the same control variables (coefficients not shown) as in Table III. All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of actively managed domestic equity mutual funds over the 2000 to 2010 period. Robust *t*-statistics adjusted for clustering at the ultimate owner level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	All Funds				Non-U.S. Funds	U.S. Funds
	(1)	(2)	(3)	(4)	(5)	(6)
Commercial Bank-Affiliated	−0.201***	−0.210***	−0.175***	−0.170***	−0.264**	−0.182**
	(−3.17)	(−3.50)	(−2.70)	(−2.72)	(−2.55)	(−2.53)
High Bias Fund	−0.120*				−0.198*	−0.005
	(−1.65)				(−1.87)	(−0.05)
High Bias Fund in Top 10 Client Stocks		−0.182**				
		(−2.38)				
High Allocation Fund			−0.160**			
			(−2.12)			
High Allocation Fund in Top 10 Client Stocks				−0.258***		
				(−2.98)		
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Number of Observations	127,238	127,238	127,880	127,880	50,810	76,428
R^2	0.15	0.15	0.15	0.15	0.088	0.247

D. Robustness Checks

Table IA.V in the Internet Appendix presents additional robustness checks of our primary finding that commercial bank-affiliated funds underperform unaffiliated funds. First, we use alternative estimation methods such as Fama and MacBeth (1973) and weighted least squares (WLS) using fund TNA as

poorer-performing client stocks within the investable universe of stocks of their bank's lending clients.

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weights. Columns (1) and (2) show that these alternative estimation methods provide estimates of the *Commercial Bank-Affiliated* coefficient that are comparable to the baseline results in Table III. Second, we check for the sensitivity of the estimates to the inclusion of small funds and earlier sample years with lower coverage of the population of funds. Columns (3) and (4) indicate that the results are robust to excluding funds with assets under management below $10 million or to excluding the first two years of the sample (2000 to 2001). Third, we check the robustness to controlling for the fund's *Active Share* (Cremers and Petajisto (2009), Cremers et al. (2016)), a proxy for managerial skill. This test alleviates concerns that bank-affiliated funds might hire less-skilled fund managers. The estimate of the *Commercial Bank-Affiliated* coefficient, reported in column (5), is similar to that in Table III, which indicates that our results are not driven by systematic differences in fund manager skills between affiliated and unaffiliated funds. Finally, we repeat our baseline test using a sample of passive funds run by bank-affiliated fund management companies. We should not find significant conflicts of interest stemming from lending activity in the case of passive funds that have little discretion to overweight client stocks. In line with this prediction, column (6) shows that bank-affiliated passive funds do not underperform unaffiliated passive funds.

We also check whether subadvisory arrangements across the different complexes affect our primary findings. Specifically, following the methodology in Chuprinin, Massa, and Schumacher (2015), we identify funds that are managed in an outsourcing relationship. We then repeat our baseline performance tests either (1) by restricting the sample to funds managed in-house and (2) by including a dummy variable for outsourced funds as a control. Table IA.VI of the Internet Appendix shows that the results are similar to those presented in Table III.

IV. Endogeneity

An important concern with our baseline results is endogeneity. A first concern is omitted variable bias, which we address using fund fixed effects in Table III. A second concern is reverse causality. Strong past performance may prompt a fund management company to operate as unaffiliated, while poorly performing funds may not be able to operate as unaffiliated. Another concern is the possibility that commercial bank-affiliated funds may have less-skilled managers. We address these issues using several empirical strategies.

A. Divestitures of Asset Management Divisions

To strengthen the causal interpretation of our results, we exploit the variation in commercial bank affiliation generated by a quasi-natural experiment. Specifically, we use asset management division divestitures by commercial banking groups to identify changes in bank affiliation that are exogenous to fund performance. We employ a difference-in-differences regression using the

three quarters before and the three quarters after the announcement quarter of a fund divestiture by a commercial banking group (treated funds). The sample includes 22 divestitures by 19 commercial banks for a total of 132 funds managed by companies sold by commercial banks to unaffiliated companies during the 2000 to 2010 period.[19]

We first isolate treated funds. Then, from the population of nontreated (unaffiliated) funds, we look for control funds that minimize the (Mahalanobis) distance between a vector of observed covariates (pre-event) across treated and nontreated funds. We select one matched control fund for each treated fund. The matching estimator produces exact matches on categorical variables but less exact matches on continuous variables (although they should be close). The categorical variables include country and investment objective. The noncategorical variables (measured one quarter before the event) include *TNA, Family TNA*, and prior year *Average Performance* (i.e., average four-factor alpha over the previous four quarters).

Panel A of Table VI reports results for equality of means and medians tests between the treatment and control groups. In general, we cannot reject the hypothesis of equal means or medians on the matching covariates between the treatment and control groups.

We estimate difference-in-differences regressions to examine whether funds' portfolio holdings of client stocks and performance change after a management company switches from affiliated to unaffiliated. In the case of the portfolio holdings tests, for each treated fund, we compute *%TNA Invested in Client Stocks* using the pre-event list of client stocks of the parent bank with which the fund management company was affiliated before the event. For each control fund, we compute its allocation to client stocks using the same pre-event list of client stocks of the treated fund. The main explanatory variables are a dummy variable that takes a value of 1 if the fund is sold by a commercial bank to an unaffiliated company (*Treated*), a dummy variable that takes a value of 1 in the quarter of the divestiture and thereafter (*After*), and the interaction term *Treated × After*.[20]

Panel B of Table VI reports the results. Columns (1) and (2) report estimates for the sample of divestitures during the 2000 to 2010 period. Column (1) shows that fund managers significantly reduce their stock holdings of clients of the parent bank after a switch from affiliated to unaffiliated relative to control funds. On average, the holdings of client stocks (*%TNA Invested in Client Stocks*) in treated funds decline by 2.4 percentage points more (*t*-statistic $= -4.75$) than control funds following a divestiture.[21] Column (2)

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[19] The events are identified by combining information from several sources including FactSet, SDC Platinum, and web searches of press releases.

[20] The *Treated* dummy variable captures the difference in *%TNA Invested in Client Stocks* between the treated fund and the control fund in the same stock holding, which corresponds to the bias variables in Table V as treated and control funds share the same benchmark.

[21] We repeat our difference-in-differences regressions using the fund benchmark weights (instead of the nearest-neighbor fund) as controls. The results reported in Table IA.VII in the Internet Appendix are similar to those presented in Table VI.

Table VI

Divestitures of Fund Management Companies by Commercial Banking Groups

This table presents estimates of difference-in-differences regressions of a fund's stock portfolio holdings and risk-adjusted performance (four-factor alpha) around the three quarters before and the three quarters after the divestiture of a fund management company by a commercial banking group. Panel A shows tests of equality of pretreatment means and medians of treated and control groups. Panel B shows estimates of difference-in-differences regressions of divestitures during the 2000 to 2010 period (columns (1) and (2)), the 2007 to 2009 global financial crisis (columns (3) and (4)), and the 2000 to 2010 period but restricting the sample to funds without fund manager turnover in the event window (columns (5) and (6)). Treated funds are those funds sold by a commercial bank to a stand-alone management company. A matched control fund is selected for each treated fund. The control fund is the nearest neighbor (Mahalanobis distance) from the same quarter, country of domicile, and investment objective (Lipper global classification) and with the closest *TNA*, *Family TNA*, and *Average Performance* (average fund's four-factor alpha in the previous four quarters). *After* is a dummy variable that takes a value of 1 in the announcement quarter of a fund divestiture and thereafter. *%TNA Invested in Client Stocks* is the percentage of TNA invested in client stocks (i.e., firms that borrow from the fund's parent bank). Variable definitions are provided in Table A.I in the Appendix. The sample consists of actively managed domestic equity mutual funds. Robust t-statistics adjusted for clustering at the deal level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Matched Sample

	Mean			Median		
	Treated	Control	t-Test (p-Value)	Treated	Control	Pearson χ^2 (p-Value)
TNA	911.9	752.6	0.41	251.6	193.3	0.33
Family TNA	32,940	22,567	0.00	21,489	9,183	0.11
Average Performance	0.13	0.06	0.80	0.19	0.34	0.90

(Continued)

Table VI—*Continued*

Panel B: Difference-in-Differences

	2000 to 2010		2007 to 2009 Global Financial Crisis		Sample without Fund Manager Turnover	
	%TNA Invested in Client Stocks (1)	Average Performance (2)	%TNA Invested in Client Stocks (3)	Average Performance (4)	%TNA Invested in Client Stocks (5)	Average Performance (6)
Treated	11.323**	−0.086**	4.444***	−0.019	13.976**	−0.063
	(2.58)	(−2.20)	(5.11)	(−0.32)	(2.71)	(−0.96)
After	−1.310	−0.402*	1.996	0.308	0.659	−0.478*
	(−0.41)	(−1.76)	(0.19)	(0.34)	(0.16)	(−1.97)
Treated × After	−2.371***	0.412***	−3.018***	0.353*	−2.704***	0.384**
	(−4.75)	(4.30)	(−3.88)	(1.87)	(−4.67)	(2.92)
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	1,584	1,577	420	420	1,140	1,136
Number of Treated Funds	132	132	35	35	95	95
Number of Deals	22	22	7	7	15	15
Number of Banks	19	19	7	7	12	12
R^2	0.175	0.135	0.041	0.186	0.271	0.157

shows that treated funds' *Average Performance* improves by 41 basis points more (*t*-statistic = 4.30) than control funds following a divestiture (the post-treatment period).

Columns (3) and (4) report estimates when we restrict the sample to the 2007 to 2009 global financial crisis (2007:Q3 to 2009:Q2). During this period, several commercial banking groups were forced to divest noncore business assets to improve their regulatory capital ratios rather than due to factors such as fund performance.[22] Some high-profile deals include the divestitures of the asset management division of Credit Suisse to Aberdeen, of Barclays Global Investors to Blackrock, and of Cominvest (Commerzbank) to Allianz. The results are similar to those in columns (1) and (2). Specifically, we find that the differential effect on portfolio holdings of client stocks is 3.0 percentage points, and the differential effect on performance is a positive 35 basis points.

As we discuss above, a potential concern with our results is that commercial bank-affiliated funds may hire less-skilled managers. This could occur if talented managers view stand-alone management companies as offering more prestigious career paths or if affiliated funds have less of an incentive to attract talent because banks can offer bundled services to clients. If affiliated funds hire less-skilled managers, then when an asset management arm is spun off, the new stand-alone entity may have to switch to a talent-based model by replacing fund managers. To mitigate this concern, we restrict the sample of divestitures to funds that do not experience fund manager turnover (i.e., manager skill remains constant) around divestitures. Columns (5) and (6) report the results for the 2000 to 2010 period, which are similar to those in columns (1) to (4). Specifically, treated funds significantly reduce their portfolio holdings of client stocks by 2.7 percentage points relative to control funds after a divestiture. In addition, the differential effect on performance is positive at 38 basis points and statistically significant. These results suggest that differences in manager skill do not explain our results.

Figure 2 shows the evolution of differences in holdings of client stocks (*%TNA Invested in Client Stocks*) and fund performance (*Average Performance*) between the treatment and control groups over the two quarters before and after a divestiture of an asset management company by a commercial banking group during the 2000 to 2010 period (Panel A) and during the 2007 to 2009 global financial crisis (Panel B). This figure is based on the estimation with the treatment variable (*Treated*) interacted with event quarter dummies. The divestitures occur between quarter −1 and quarter 0. The figure shows that the two groups follow parallel trends in the pretreatment period. A switch from affiliated to unaffiliated is accompanied by significant reductions in the holdings of client stocks. There is also evidence of an improvement in fund performance following divestitures.

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[22] See "Fund management–Wasting assets," *The Economist*, January 18, 2009.
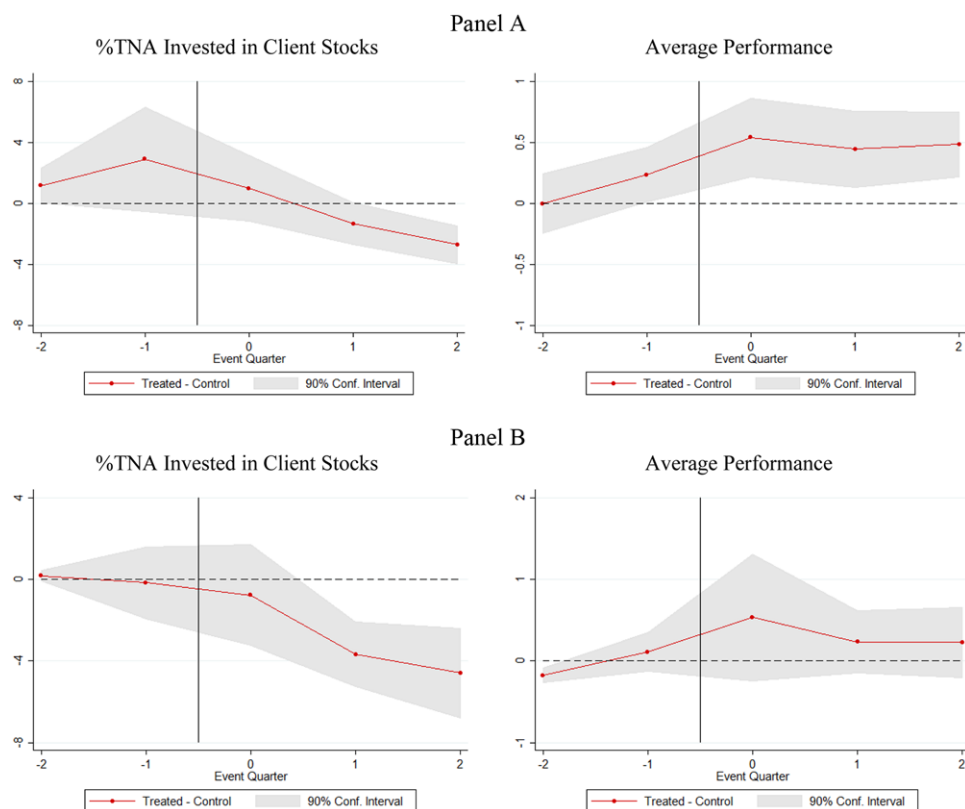
Figure 2. Funds' client stock holdings and performance around divestitures. This figure shows commercial bank-affiliated funds' portfolio holdings of client stocks and performance around divestitures of fund management companies in the 2000 to 2010 (Panel A) and 2007 to 2009 global financial crisis (Panel B) periods. *%TNA Invested in Client Stocks* is the percentage of TNA invested in stocks of firms that borrow from the fund's parent bank. *Average Performance* is the average four-factor alpha over the last four quarters. The sample of divestitures includes funds of management companies affiliated with commercial banking groups that are sold to stand-alone management companies. The divestitures occur between quarter −1 and quarter 0. The sample consists of actively managed domestic equity mutual funds. (Color figure can be viewed at wileyonlinelibrary.com)

B. Calendar-Time Portfolio Return Tests

To further rule out alternative channels, we use a calendar-time portfolio approach to study the performance of affiliated funds in the trading of client and nonclient stock holdings. In these tests, we compare manager skill for affiliated funds with regard to two groups of holdings—client stocks and nonclient stocks. If fund managers face conflicts of interest with the lending division, then the client stocks that a fund buys should underperform the client stocks that the fund sells. In addition, the nonclient stocks that a fund buys should perform similarly to the nonclient stocks that the fund sells. Notice that significant

Table VII
Calendar-Time Portfolio Returns on Buys Minus Sells of Client and Nonclient Stocks

This table presents risk-adjusted monthly portfolio returns of the client stocks a fund buys and sells, defined as the portfolio of client stocks (i.e., firms that borrow from the fund's parent bank) held by bank-affiliated funds that had an increase or decrease in the number of shares held in the previous quarter, respectively. Portfolio returns of the nonclient stocks a fund buys and sells are defined similarly. Every quarter in the 2000 to 2010 period, each fund's portfolio holdings are split into a client portfolio and a nonclient portfolio. These two portfolios are further subdivided into a buy portfolio and a sell portfolio. We calculate the average portfolio return across funds in each month weighted by TNA, and then the return of the portfolio of stocks bought minus sold in each month. Returns are risk-adjusted using the Carhart four-factor model with global factors. The high and low bias fund groups consist of those funds that are above and below the median of the *Bias in Client Stocks* variable in a given country and quarter. The sample consists of actively managed domestic equity mutual funds that are affiliated with commercial banking groups over the 2000 to 2010 period. Robust *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	All Bank-Affiliated Funds (1)	High Bias Funds (2)	Low Bias Funds (3)
Client Stocks	−0.115	−0.226*	0.169
	(−0.99)	(−1.90)	(0.68)
Nonclient Stocks	0.033	0.044	0.021
	(0.60)	(0.65)	(0.32)
Client − Nonclient Stocks	−0.148	−0.269*	0.148
	(−1.23)	(−1.90)	(0.61)

underperformance for both client and nonclient stocks would indicate that affiliated fund managers have less skill than unaffiliated fund managers.[23]

We compute the value-weighted monthly portfolio return in quarter t of client stocks in which a fund increased its holdings (in terms of number of shares) in quarter $t-1$. Similarly, we calculate the return to a portfolio of client stocks in which holdings decreased in quarter $t-1$. We average returns across funds in each month weighted by TNA. Next, we compute the average return of the client stocks bought minus the client stocks sold in each month, and the corresponding risk-adjusted return using Carhart (1997) four-factor alphas with global factors. We follow the same steps to compute the risk-adjusted performance of the nonclient stocks bought and sold, and compare performance on client stocks relative to nonclient stocks.

Table VII reports the average monthly four-factor alpha of client stocks and nonclient stocks bought minus sold. Column (1) shows that client stocks bought underperform client stocks sold by 11.5 basis points per month, which is statistically insignificant. The nonclient stock portfolio return (buys minus sells) is positive and statistically insignificant. The difference in portfolio returns between client stocks and nonclient stocks is −15 basis points but statistically

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[23] Alternatively, if fund managers have private information on lending clients, then the client stocks that the fund buys should outperform the client stocks that the fund sells.

insignificant. The estimate indicates that the exposure to client stocks represents about 30% of the average underperformance of bank-affiliated funds.[24]

The source of the underperformance in the trading of client stocks is related to the decision to overweight client stocks. We therefore expect the underperformance in the trading of client stocks to be concentrated in the group of affiliated funds that overweight client stocks to a greater extent (*High Bias Funds*). In addition, we do not expect to find underperformance in the group of affiliated funds with low bias in client stocks (*Low Bias Funds*). Column (2) shows that client stocks bought significantly *underperform* client stocks sold by 23 basis points in the group of *High Bias Funds*, while column (3) shows that client stocks bought *outperform* client stocks sold by 17 basis points in the group of *Low Bias Funds*. In the case of nonclient stocks, the alphas are neither statistically nor economically significant. The difference in portfolio returns between client and nonclient stocks is significant at -27 basis points in the group of *High Bias Funds* and statistically insignificant in the group of *Low Bias Funds*. The estimate for the group of *High Bias Funds* indicates that the exposure to client stocks (23.8% of the fund's TNA on average) represents about 60% of the underperformance among affiliated funds that overweight client stocks to a greater extent. These results are consistent with the idea that manager skill is similar in affiliated and unaffiliated funds, and thus the skill hypothesis does not explain the underperformance of affiliated funds.

We also examine the performance of client stocks bought and sold during bear market periods in the group of *High Bias Funds*. We find that client stocks bought significantly underperform client stocks sold by 50 basis points, while nonclient stock portfolio returns are statistically insignificant. The difference in portfolio returns between client stocks and nonclient stocks is -64 basis points (t-statistic $= -2.55$) in bear markets, while the difference is statistically insignificant in bull markets. We conclude that the underperformance in client stocks is driven by market downturns, when a bank's balance sheet would suffer most from deterioration in the pricing of loans.

To shed light on the reason behind the performance gap of bank-affiliated funds on client stocks, we examine the trading activity of affiliated fund managers on client stocks and nonclient stocks. Table IA.VIII in the Internet Appendix reports estimates of a fund-stock-quarter regression of fund holding turnover on the *Commercial Bank-Affiliated* dummy variable and a *Client Stock* dummy variable, which takes a value of 1 if the stock holding is from a fund's parent bank lending client. We find that bank-affiliated funds trade significantly more frequently in client stocks than in nonclient stocks.

We also examine the behavior of affiliated funds when they are more valuable to lending clients, for example, when the lending clients experience a

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[24] Bank-affiliated funds underperform by 15 basis points in the trading of client stocks versus nonclient stocks using the estimate in column (1) of Table VII. Since these funds hold, on average, 14.7% of the TNA in client stocks, this implies that the underperformance due to this channel is 26 basis points per year ($= 15 \times 14.7\% \times 12$). This corresponds to about 30% of the average underperformance of bank-affiliated funds.

negative shock. Following Cohen and Schmidt (2009), we look at downward price pressure events caused by widespread selling of client stock using the dummy variable *%Comp Sold>1*, which takes a value of 1 when more than 1% of the shares outstanding of a stock are sold in aggregate by all funds in a quarter (excluding funds from the own-management company). Table IA.IX in the Internet Appendix reports estimates of a fund-stock-quarter regression of the logarithm of fund holding ownership on the *Commercial Bank-Affiliated, Client Stock*, and *%Comp Sold>1* dummy variables. We find that affiliated funds increase their ownership of client stocks in periods of high selling pressure by other funds, as indicated by the positive and significant coefficient on *Client Stock × %Comp Sold>1*. This effect is economically significant, as bank-affiliated funds increase their holdings in client stocks by about 3% more than in nonclient stocks following a negative shock. This is consistent with the idea that affiliated funds provide price support during negative shocks, which biases their portfolios toward poorer-performing client stocks. These results suggest that affiliated fund managers act as liquidity providers for client stocks, which leads to higher turnover and poorer performance in their client stock's portfolio holdings.

C. Placebo Tests

As a placebo test of our baseline regressions, we use a sample of international equity funds (i.e., funds that invest outside their local market). We expect relationship lending to be less important, and arm's-length (i.e., transactional) lending to be more important, in the international syndicated loan market than in the domestic market.

Table IA.X reports the estimates for the sample of international funds. Column (1) shows less of a pronounced performance gap of bank-affiliated funds relative to unaffiliated funds in the sample of international funds (11 basis points per quarter) than in the sample of domestic funds (23 basis points, as shown in Table III). Columns (2) and (3) show estimates of regressions that include the *High Bias Fund* or *High Allocation Fund* dummy variables. While international funds affiliated with a commercial banking group underperform unaffiliated funds, this underperformance is not driven by conflicts of interest with the lending division since the coefficients on both the *High Bias Fund* and *High Allocation Fund* dummies are statistically insignificant. Note that these same coefficients are statistically significant in the sample of domestic funds in Table V. These results are consistent with fund managers' portfolio choices in international funds being less distorted by lending relationships, as conflicts of interest should be more important for domestic borrowers than foreign borrowers.

V. Equilibrium

In this section, we provide evidence that the decision to favor the stock of the bank's lending clients benefits various agents (the parent bank, the fund

manager, and the borrowing firm's managers). We also provide evidence that investors of bank-affiliated funds exhibit inertia, as flows have low sensitivity to poor performance, which explains why affiliated funds hold significant market shares despite their inferior performance.

A. *Benefits to the Bank*

We examine the trade-off between the lending and asset management divisions when the parent bank uses its affiliated funds to support its lending business by overweighting client stocks. On the one hand, this biased portfolio allocation may impose a cost as affiliated funds may underperform their peers (i.e., funds that track the same benchmark) and therefore experience significant outflows and erosion of fees. On the other hand, using fund resources may help build long-term relationships with borrowers and increase the likelihood of the bank acting as a lead arranger of future loans.

To test for potential benefits to the banking group, we examine whether bank-affiliated fund holdings in client stocks make it more likely that the bank will be chosen as a lead arranger for future loans of the same borrower firm. We perform this test following the methodology in Bharath et al. (2007) and Ferreira and Matos (2012). Specifically, for each loan facility, we pair firms with each of the top 20 banks in a country in terms of syndicated loan volume in U.S. dollars. We then estimate a logit model in which the dependent variable is a dummy variable that takes a value of 1 if the bank acted as a lead arranger, and 0 otherwise.

Table VIII reports the results. The estimates in column (1) indicate that banks tend to arrange more loans for firms in which their affiliated funds hold stock (*Client Stock Holding*). On average, banks with affiliated fund holdings in borrowers are 3.2% more likely to be chosen as lead arrangers than banks without affiliated fund holdings in borrowers (the probability increases from 12.6% to 15.8%). The relative importance of affiliated fund holdings in increasing the bank's lending business depends on whether or not the bank has a past lending relationship (over the past three years) with the borrower. For new lending relationships, affiliated fund holdings in the borrower increase the likelihood that the bank will act as a lead arranger by 2.6% (from 9.4% to 12%); for past lending relationships, banks are 6.6% more likely to act as lead arrangers (from 41.3% to 47.9%).

The probability that the bank acts as a lead arranger should increase with the size of the affiliated fund holdings in the borrower. To test this conjecture, we repeat our analysis using a dummy that takes a value of 1 if the bank's affiliated funds together hold at least 1% of the borrower firm's shares (*Client Stock Holdings>1%*). The results in column (2) show that, on average, banks with affiliated fund holdings in a borrower of at least 1% of shares outstanding are 4.5% more likely to be chosen as lead arrangers than other banks. While for new relationships, the probability of being chosen as lead bank increases by 3.5%, for past lending clients, it increases by 8.4%.

Table VIII

Probability of Getting Future Lending Business and Client Stock Holdings

This table presents estimates of logit regressions of whether the existence of a bank-firm (i, j) link through bank-affiliated funds' portfolio holdings prior to the loan affects the probability that firm (borrower) j chooses bank i as a lead arranger in the syndicated loan market. For each facility, there is a choice set of 20 potential lead arrangers (top 20 ranked by U.S. dollar volume of syndicated loans in each country). The dependent variable is a dummy variable that takes the value of 1 if bank i acted as a lead arranger, and 0 otherwise. *Client Stock Holding* is a dummy variable that takes the value of 1 if the funds affiliated with bank i hold stock of the firm at the end of the previous year, and 0 otherwise. *Client Stock Holding>1%* is a dummy that takes the value of 1 if the funds affiliated with bank i hold at least 1% of the firm's shares outstanding at the end of the previous year, and 0 otherwise. *Bank Market Share* is the fraction of bank i of the U.S. dollar volume of syndicated loans in each country. *Lending Relationship* is a dummy that takes the value of 1 if firm j chose bank i as a lead arranger in a loan over the past three years. Firm-level controls include stock market capitalization (log), book-to-market ratio, leverage, tangibility, stock volatility, and stock return (coefficients not shown). All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of syndicated loans by publicly listed borrowers over the 2000 to 2010 period. Robust t-statistics adjusted for clustering at the firm and bank levels are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Client Stock Holding	0.269***		0.193***	
	(5.72)		(3.03)	
Client Stock Holding > 1%		0.339***		0.324***
		(3.56)		(3.75)
Bank Market Share	13.266***	13.522***	13.586***	13.824***
	(22.67)	(23.50)	(16.68)	(15.96)
Lending Relationship	1.911***	1.946***	1.748***	1.750***
	(27.33)	(29.07)	(24.61)	(24.79)
log(Bank Assets)			0.119	0.108
			(1.27)	(1.11)
Bank Return on Assets			0.095	0.105
			(1.14)	(1.31)
Year Fixed Effects	Yes	Yes	Yes	Yes
Loan Purpose Fixed Effects	Yes	Yes	Yes	Yes
Bank Fixed Effects	No	No	Yes	Yes
Firm Controls	No	No	Yes	Yes
Firm Industry Fixed Effects	Yes	Yes	Yes	Yes
Firm Country Fixed Effects	Yes	Yes	Yes	Yes
Number of Observations	499,143	499,143	402,733	402,733
Pseudo R^2	0.21	0.21	0.23	0.23

Probability of being chosen as the lead lender using the column (1) specification

		Past Lending Relationship	
	Average	No	Yes
Client Stock Holdings = 0	0.126	0.094	0.413
Client Stock Holdings = 1	0.158	0.120	0.479
Change in Probability	0.032	0.026	0.066

(*Continued*)

Table VIII—*Continued*

Probability of being chosen as the lead lender using the column (2) specification

		Past Lending Relationship	
	Average	No	Yes
Client Stock Holdings >1% = 0	0.135	0.101	0.441
Client Stock Holdings >1% = 1	0.180	0.136	0.525
Change in Probability	0.045	0.035	0.084

Columns (3) and (4) show that the results are robust to including bank (lender)-specific controls (assets, return on assets); bank fixed effects; firm (borrower)-specific controls (market capitalization, book-to-market ratio, leverage, tangibility, stock volatility, and stock return); and firm-country and industry fixed effects.

B. Benefits to the Lending Client

Commercial banks may use affiliated funds to boost their voting rights and thus increase influence over the borrower's board of directors. This influence could help build long-term relationships that lead to future loan business. In this case, we would expect affiliated funds to systematically overweight client stocks to curry favor with the borrower's management. To examine this hypothesis, we estimate a firm-level regression of voting dissent in executive compensation proposals on ownership by funds affiliated with banks that acted as lead arrangers over the previous three years.

The sample consists of firms from 17 countries for which voting records are available in Institutional Shareholder Services/RiskMetrics (ISS) over the 2008 to 2010 period.[25] The great majority of proposals are management sponsored, and there is close to 100% approval in routine issues, with the exception of those related to executive compensation (i.e., votes on option plans, repricing of options, restricted stock, bonuses, and loans). We focus our analysis on voting dissent, defined as the percentage of votes against management's recommendation on compensation plans.

Table IX reports the results. The results in column (1) show that ownership by funds affiliated with lenders reduces voting dissent in proposals related to executive compensation at shareholder meetings, as indicated by the negative and significant coefficient on *Lender-Affiliated Funds Ownership*. However, ownership by funds affiliated with banks that have not acted as lead arrangers for the firms' loans over the past three years (*Nonlender-Affiliated Funds Ownership*) is not significantly associated with voting dissent. The effect is also economically significant: a one-standard-deviation increase in

[25] The sample consists of firms in major European stock indices (Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom) as well Australia, Canada, and Japan.

Table IX

Voting Dissent and Commercial Bank-Affiliated Funds Ownership

This table presents estimates of ordinary least squares (OLS) and tobit (with censoring at 0 and 1) firm-level panel regressions of voting dissent on executive compensation proposals. The dependent variable is the percentage of votes against management's proposals on executive compensation plans at shareholder meetings (*Voting Dissent*). *Lender-Affiliated Funds Ownership* is ownership by funds affiliated with commercial banks that were chosen by firm *j* as lead arrangers in a loan over the past three years. *Nonlender-Affiliated Funds Ownership* is ownership by funds affiliated with commercial banks that were not chosen by firm *j* as lead arrangers in a loan over the past three years. *Unaffiliated Funds Ownership* is ownership by funds unaffiliated with commercial banks. *Institutional ownership* is total institutional ownership and *Insider Ownership* is closely held shares. Ownership variables are defined as a percentage of market capitalization. All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of non-U.S. firms for which votes at shareholder meetings are available in Institutional Shareholder Services/RiskMetrics (ISS) over the 2008 to 2010 period. Robust *t*-statistics adjusted for clustering at the country-industry level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	OLS		Tobit	
	(1)	(2)	(3)	(4)
Lender-Affiliated Funds Ownership	-0.545^{**}	-0.520^{**}	-0.639^{**}	-0.642^{**}
	(-2.16)	(-2.12)	(-1.97)	(-2.04)
Nonlender-Affiliated Funds Ownership	-0.124		-0.128	
	(-1.28)		(-1.04)	
Unaffiliated Funds Ownership	0.092^{*}		0.107	
	(1.84)		(1.64)	
Institutional Ownership		0.043^{*}		0.065^{**}
		(1.75)		(2.05)
Insider Ownership	-0.023^{*}	-0.016	-0.032^{**}	-0.022
	(-1.71)	(-1.13)	(-2.09)	(-1.33)
log(Market Capitalization)	-0.003	-0.003	-0.001	-0.002
	(-1.18)	(-1.45)	(-0.35)	(-0.82)
Leverage	0.032^{*}	0.029	0.041^{*}	0.038^{*}
	(1.73)	(1.62)	(1.93)	(1.82)
Book-to-Market	0.002	0.002	0.001	0.000
	(0.33)	(0.29)	(0.10)	(0.05)
Return on Assets	-0.040^{**}	-0.040^{**}	-0.042^{**}	-0.041^{**}
	(-2.50)	(-2.42)	(-2.25)	(-2.25)
Year Fixed Effects	Yes	Yes	Yes	Yes
Stock Country Fixed Effects	Yes	Yes	Yes	Yes
Stock Industry Fixed Effects	Yes	Yes	Yes	Yes
Number of Observations	2,263	2,263	2,263	2,263
R^2	0.104	0.104		

Lender-Affiliated Funds Ownership increases voting dissent by 0.54%, which corresponds to about 10% of the average voting dissent. In addition, ownership by unaffiliated fund is associated with more voting dissent in executive compensation proposals. The results in columns (2) to (4) show that the results hold when we include total institutional ownership as a control or use tobit regressions.

C. Benefits to the Fund Manager

The results so far show that overweighting client stocks in affiliated funds' portfolios can be beneficial from the perspective of the commercial banking group as a whole. It is not clear, however, why fund managers would support this strategy if doing so would hurt their track record. One possible explanation is that managers are rewarded by being less likely to be replaced. In this section, we test the hypothesis that favoring client stocks in portfolio choices reduces a fund manager's career concerns. To test for potential benefits to the fund manager, we test whether affiliated fund managers with greater bias toward client stocks (*High Bias Fund*) are less likely to be replaced than affiliated managers with less of a bias toward client stocks (*Low Bias Fund*).

Our sources of data on manager names and tenures (i.e., fund manager start dates) are the historical annual files from Lipper. From these historical files, we assemble a data set on fund manager turnover over the 2004 to 2010 period. We estimate a fund-level probit regression of fund manager turnover-performance sensitivity in which the dependent variable is a dummy variable that takes a value of 1 if there is a turnover in a given quarter (given that the fund survived), and 0 otherwise. The main explanatory variables are the *Commercial Bank-Affiliated* dummy and the *High Bias Fund* dummy. We also control for lagged performance rank and other fund and manager characteristics (Khorana (1996), Chevalier and Ellison (1999), Kostovetsky and Warner (2015)). In each quarter and country, fractional performance ranks ranging from 0 (poorest performance) to 1 (best performance) are assigned to funds according to their returns over the past four quarters (*Rank*).

Table X reports the estimates of probit regressions of fund manager turnover. We present the results separately for the samples of all funds, non-U.S. funds, and U.S. funds. In column (1), which corresponds to the sample of all funds, the coefficient on the *High Bias Fund* dummy is negative but statistically insignificant. In column (2), which corresponds to the sample of non-U.S. funds, the coefficient on the *High Bias Fund* dummy is negative and statistically significant. The panel at the bottom of the table shows the economic significance of overweighting client stocks on the probability of fund manager turnover. The predicted probability of a fund manager turnover in a given quarter for a fund manager with more overweight on client stocks (other variables being evaluated at their means) is 0.93% lower than that for a fund manager with lower bias on client stocks in the sample of non-U.S. funds (the unconditional probability of observing a turnover in a given quarter is about 2%). Column (3) shows that the probability of a fund manager turnover is not associated with the decision to favor client stocks in portfolio choice in the sample of U.S. funds. Figure IA.1 in the Internet Appendix shows that fund manager turnover-performance sensitivity is different between high and low bias funds in the sample of all funds and non-U.S. funds, while it is similar between high and low bias funds in the sample of U.S. funds. In addition,

Table X

Commercial Bank-Affiliated Fund Manager Turnover and Portfolio Allocation to Client Stocks

This table presents estimates of fund-level probit regressions of fund manager turnover-performance sensitivity. The dependent variable is a dummy variable that takes a value of 1 if the fund manager is replaced in a quarter, and 0 otherwise (*Fund Manager Turnover*). *Commercial Bank-Affiliated* is a dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is a commercial banking group, and 0 otherwise. *High Bias Fund* is a dummy variable that takes a value of 1 if an affiliated fund's *Bias in Client Stocks* is above the median in a given country and quarter, and 0 otherwise. *Bias in Client Stocks* is the portfolio bias in stocks of firms that borrow from the fund's parent bank versus the average weight of comparable passive funds. All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of actively managed domestic equity mutual funds over the 2004 to 2010 period. Robust *t*-statistics adjusted for clustering at the ultimate owner level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	All Funds (1)	Non-U.S. Funds (2)	U.S. Funds (3)
Commercial Bank-Affiliated	0.109***	0.149***	0.075
	(2.66)	(2.58)	(1.20)
High Bias Fund	−0.081	−0.188***	0.002
	(−1.41)	(−2.73)	(0.02)
Rank	−0.144***	−0.168**	−0.137**
	(−3.15)	(−2.29)	(−2.37)
Fund Manager Tenure	0.009***	0.024***	0.000
	(2.60)	(4.67)	(0.04)
log(TNA)	−0.039***	−0.024*	−0.048***
	(−3.67)	(−1.78)	(−3.72)
log(Family TNA)	0.058***	0.034*	0.064***
	(4.95)	(1.82)	(4.90)
log(1+Age)	−0.005	−0.059	0.032
	(−0.19)	(−1.53)	(1.15)
Flow	−0.003**	−0.002	−0.003**
	(−2.11)	(−0.95)	(−1.98)
Team-Managed	−0.140***	−0.220***	−0.106**
	(−4.12)	(−3.37)	(−2.55)
Year Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	No
Number of Observations	72,373	26,052	46,321
Pseudo-R^2	0.055	0.102	0.035
Probability (*fund manager left* |*fund survived*) *in quarter t*			
High Bias Fund = 0	2.01%	2.75%	1.57%
High Bias Fund = 1	1.66%	1.82%	1.58%
Change in Probability	−0.35%	−0.93%	0.01%

Table IA.II in the Internet Appendix shows that conflicts of interest are more pronounced during bear markets, when fund managers have heightened career concerns.[26]

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[26] During bear markets, net inflows into mutual funds are generally weak (Karceski (2002)), and fund family profitability is lower. Both effects lead to lower compensation incentives for fund

In short, we find that fund managers who act as team players for the banking group by favoring client stocks benefit from a lower probability of turnover. This result does not hold for the sample of funds domiciled in the United States where there are fewer conflicts of interest between the lending and asset management divisions.

D. Investor Clienteles

We also examine the behavior of end investors of bank-affiliated funds. We account for the possibility of different clienteles by studying the sensitivity of fund flows to past fund performance using the piecewise linear regression of Sirri and Tufano (1998): $Low = \min(0.2, Rank)$, $Mid = \min(0.6, Rank - Low)$, and $High = Rank - (Low + Mid)$. We compare the sensitivity of flows to past fund performance of affiliated funds versus unaffiliated fund investors.

Table XI reports the estimates of fund flow-performance sensitivity regressions for the sample of all funds as well as for the samples of non-U.S. and U.S. funds. The estimates in columns (1) and (2), which correspond to the sample of all funds, show that investors of affiliated funds and unaffiliated funds exhibit similar flow-performance sensitivity. However, the estimates in columns (3) and (4) show that affiliated funds have less flow-performance sensitivity than unaffiliated funds in the sample of non-U.S. funds: a 10-percentile increase in performance rank over the prior year increases unaffiliated fund flows by 4.0% ($= 0.1 \times 9.984 \times 4$) per year for the bottom quintile, 1.3% per year for the middle three quintiles, and 7.0% per year for the top quintile, while it increases affiliated fund flows by 1.3% for the bottom quintile, 1.1% for the middle three quintiles, and 5.8% for the top quintile. The sensitivity of affiliated fund flows to poor performance is statistically insignificant, which suggests that affiliated fund investors (typically, retail investors) exhibit inertia. In addition, the difference in flow-performance sensitivities between affiliated funds and unaffiliated funds is statistically significant for the bottom performance quintile (*t*-statistic is 1.97).[27] We conclude that affiliated fund flows outside the United States tend to be more "sticky and less discerning" (using the terminology in Sialm, Starks, and Zhang (2015) and other papers on fund flows).

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managers in bear markets, as compensation is linked to fund size and fund family profitability (Farnsworth and Taylor (2006)). Moreover, the probability of job loss for fund managers is generally higher in bear markets (Chevalier and Ellison (1999)), when there are more fund closures and managers have fewer employment options (Kempf, Ruenzi, and Thiele (2009)).

[27] We also estimate flow-performance sensitivity regressions using a sample at the fund share class level. The results reported in Table IA.XI in the Internet Appendix show that, for the sample of non-U.S. funds, the sensitivity of retail investors of bank-affiliated funds is statistically insignificant and less than half (6.4 versus 17.4) of that of retail investors of unaffiliated funds for the bottom performance quintile. However, the results on flows for institutional share classes are estimated without precision, which we attribute to a low number of observations in the sample of institutional share classes outside of the United States. In fact, in our sample of non-U.S. funds, as of December 2010, institutional share classes amount to only 8% and 6% of the total number of share classes and TNA, respectively. This fact suggests that, outside the United States, the mutual fund market is oriented mostly toward the (less sophisticated) retail segment.

Table XI

Flows to Commercial Bank-Affiliated Funds

This table presents estimates of ordinary least squares (OLS) regressions of fund flows (percentage growth in TNA). In columns (1), (3), and (5), the sample consists of those funds whose ultimate owner of the fund's management company is a commercial banking group (commercial bank-affiliated funds). In columns (2), (4), and (6), the sample consists of all other funds (unaffiliated funds). The piecewise linear specification includes three performance rank segments: $Low = \min(0.2, Rank)$, $Mid = \min(0.6, Rank - Low)$, and $High = Rank - (Low + Mid)$. $Rank$ is the fractional performance rank ranging from 0 to 1, which is assigned according to the average four-factor alpha over the past four quarters in a given quarter and country. All control variables are lagged by one period. Variable definitions are provided in Table A.I in the Appendix. The sample consists of actively managed domestic equity mutual funds over the 2000 to 2010 period. Robust t-statistics adjusted for clustering at the ultimate owner level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	All Funds		Non-U.S. Funds		U.S. Funds	
	Affiliated (1)	Unaffiliated (2)	Affiliated (3)	Unaffiliated (4)	Affiliated (5)	Unaffiliated (6)
Low	8.713***	7.107***	3.227	9.984***	12.149***	5.303**
	(4.31)	(3.93)	(1.38)	(3.91)	(3.91)	(2.34)
Mid	3.929***	4.759***	2.847***	3.250***	4.793***	5.446***
	(8.39)	(12.02)	(4.58)	(5.32)	(7.88)	(10.68)
High	10.632***	14.521***	14.541***	17.593***	5.427	13.010***
	(3.66)	(6.72)	(4.02)	(6.72)	(1.28)	(4.25)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	No	No
Number of Observations	41,046	78,378	21,474	25,979	19,572	52,399
R^2	0.088	0.101	0.057	0.070	0.157	0.118

The conflict of interest hypothesis assumes that affiliated fund investors are unsophisticated. Alternatively, investors may be trading off performance in exchange for some other benefits with the bank (e.g., lower commissions, lower spread on mortgages), which would be a result of an institutional arrangement between investors and the banking group rather than a conflict of interest within the bank. To address this possibility, Table IA.XII in the Internet Appendix reports estimates of our baseline performance regressions for a sample of funds that cater exclusively to retail investors (i.e., funds without an institutional share class) and for a sample of funds that cater to both retail and institutional investors (i.e., funds with at least one institutional share class). The results reported in Panel A show that bank-affiliated funds that cater exclusively to retail investors significantly underperform unaffiliated funds. In contrast, the results in Panel B show that funds that cater to both retail and institutional investors do not significantly underperform unaffiliated funds. These results are consistent with the notion that greater monitoring exerted by institutional investors reduces agency problems (e.g., Evans and Fahlenbrach (2012)). Taken together, our results suggest that the underperformance of affiliated funds is driven by funds that cater exclusively to retail investors, and thus provide further support for the conflict of interest hypothesis.[28]

Overall, our results show that outside the United States, investors of affiliated funds exhibit inertia by failing to sell past losers and forgoing performance. This result contrasts with those for U.S. funds, in which investors of affiliated funds do not exhibit inertia. Consistent with our results, commercial bank-affiliated funds have been losing market share in the United States, while outside the United States, they still have a significant market share.[29]

VI. Conclusion

We show that mutual fund performance is negatively affected when a management company is owned by a commercial banking group. We find that commercial bank-affiliated funds underperform unaffiliated funds by about 92 basis points per year. Underperformance is more pronounced the larger the size of the lending division relative to the asset management division and the higher the funds' direct exposure to the stock of the bank's lending clients. We interpret these results as indicating that bank-affiliated fund underperformance is driven by a conflict of interest between the bank's lending business and asset management business.

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[28] We also estimate the flow-performance sensitivity regressions in Table XI using the sample of funds that cater exclusively to retail investors. Table IA.XIII in the Internet Appendix shows that the sensitivity of affiliated fund flows to poor performance is statistically insignificant outside the United States.

[29] The estimates in Figure IA.2 in the Internet Appendix show that bank-affiliated domestic equity funds lost significant market share both in the United States (from 18% in 2000 to 11% in 2010) and outside the United States (from 60% in 2000 to 40% in 2010). However, while affiliated funds appear to be disappearing in the United States, outside the United States, they are able to capture significant market share of both incumbent and new funds.

We use divestitures of asset management divisions as a quasi-natural experiment to address the concern that past performance may affect the organizational form of a fund management company. To address the concern that our results might be driven by affiliated funds attracting less talented managers, we compare the performance of bank-affiliated fund managers on the trading of client stocks and nonclient stocks. While the client stocks that a fund buys underperform the client stocks that a fund sells, this is not the case for nonclient stocks, which indicates that differences in manager skill are not likely to explain our findings.

The evidence shows that affiliated funds systematically overweight stocks of lending clients, which may help their parent banks build long-term relationships with borrower firms that lead to future loan business. Our results also suggest a benefit to the borrower's management, as we find that ownership by lender-affiliated funds reduces voting dissent on executive compensation proposals at borrower shareholder meetings. We further find that fund managers that favor client stocks face a lower likelihood of turnover for the same performance rank than managers with less of a bias toward client stocks. Bank-affiliated funds still hold significant market share despite their inferior performance outside the United States, as affiliated fund flows tend to be sticky and not discerning.

Overall, our results suggest that the underperformance of commercial bank-affiliated funds results from a double agency problem whereby fund managers set aside the interests of one principal (the fund investor) to benefit another principal (the parent bank). Our findings have important implications, as about 40% of mutual funds worldwide operate not as stand-alone entities, but rather as divisions of commercial banking groups.

Appendix

Table A.I
Variable Definitions

Variable	Definition
Commercial Bank-Affiliated	Dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is a commercial banking group, and 0 otherwise (Lipper and FactSet).
Publicly Traded Parent	Dummy variable that takes a value of 1 if the ultimate owner's stock of the fund's management company is publicly traded, and 0 otherwise (Lipper and FactSet).
Insurance-Affiliated	Dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is an insurance banking group, and 0 otherwise (Lipper and FactSet).
Investment Bank-Affiliated	Dummy variable that takes a value of 1 if the ultimate owner of the fund's management company is among the top 20 investment banks in a given region and quarter, and 0 otherwise (Lipper and FactSet).
Loans/TNA	Loans outstanding (Bankscope item 2000) of the fund's parent bank divided by total net assets (in equity funds) of the fund management company (Lipper).
Corporate Loans/TNA	Corporate and commercial loans outstanding (Bankscope item 11060) of the fund's parent bank divided by total net assets (in equity funds) of the fund management company (Lipper).
Interest Income/Fees	The fund's parent bank interest income on loans (Bankscope item 10010) divided by revenues of the fund management company, defined as the product of total net assets by total expense ratio (in equity funds) (Lipper).
%TNA Invested in Client Stocks	Sum of portfolio holdings in stocks of firms that are among the fund's parent bank lending clients over the past three years (FactSet).
%TNA Invested in Top 10 Client Stocks	Sum of portfolio holdings in stocks of firms that are among the top 10 lending clients of the fund's parent bank over the past three years (FactSet).
Bias in Client Stocks	Sum of portfolio bias (difference in portfolio weight compared to passive funds with the same benchmark) in stocks of firms that are among the fund's parent bank lending clients over the past three years (FactSet).
Bias in Top 10 Client Stocks	Sum of portfolio bias in stocks of firms that are among the top 10 lending clients of the fund's parent bank over the past three years (FactSet).
Four-Factor Alpha	Four-factor alpha (per quarter), estimated with three years of past monthly fund net returns in U.S. dollars and with regional factors (Asia, Europe, North America, or Emerging Markets) or world factors in the case of world funds (Lipper).
Benchmark-Adjusted Return	Difference between the fund's net return and its benchmark return (per quarter) (Lipper).
Gross-Four-Factor Alpha	Four-factor alpha (percentage per quarter), estimated with three years of past monthly fund gross returns in U.S. dollars and with regional factors (Asia, Europe, North America, or Emerging Markets) or world factors in the case of world funds (Lipper).

(*Continued*)

Table A.I—*Continued*

Variable	Definition
Buy-and-Hold Benchmark-Adj. Return	Difference between the fund's buy-and-hold return and its benchmark return (per quarter) (Lipper).
Information Ratio	Ratio of four-factor alpha to the standard deviation of the residuals of the four-factor model (Lipper).
TNA	Total net assets (in millions of U.S. dollars) of the fund (Lipper).
Family TNA ($ million)	Total net assets (in millions of U.S. dollars) of funds managed by the fund management company to which the fund belongs (Lipper).
Age	Number of years since the fund launch date (Lipper).
Total Expense Ratio	Total annual expenses as a fraction of TNA (Lipper).
Total Load	Sum of front- and back-end loads as a fraction of new investments (Lipper).
Flow	Percentage growth in TNA in a quarter, net of internal growth (assuming reinvestment of dividends and distributions) (Lipper).
Number of Countries of Sale	Number of countries in which the fund is sold (Lipper).
Team-Managed	Dummy variable that takes a value of 1 if the fund is managed by a team, and 0 otherwise (Lipper).
Client Stock Holding	Dummy that takes a value of 1 if the funds affiliated with a lead arranger bank hold stock of the borrower at the end of the previous year (FactSet).
Client Stock Holding>1%	Dummy that takes a value of 1 if the funds affiliated with a lead arranger bank own at least 1% of the shares of the borrower at the end of the previous year (FactSet).
Bank Market Share	Fraction of the lead arranger bank in U.S. dollar volume of loans in each country (DealScan).
Lending Relationship	Dummy that takes a value of 1 if a firm chose a bank as lead arranger of a loan over the past three years (DealScan).
Bank Assets	Book value of assets in millions of U.S. dollars of the lead arranger bank (Bankscope item 2000).
Bank Return on Assets	Return on assets of the lead arranger bank (Bankscope item 4024).
Market Capitalization	Market capitalization in U.S. dollars (Datastream item MV).
Book-to-Market	Book value of equity divided by market value of equity (Worldscope item 03501/item 08001).
Leverage	Ratio of total debt to total assets (WorldScope item 03255/item 02999).
Tangibility	Net property, plant, and equipment divided by total assets (Worldscope item 02501/item 02999).
Stock Volatility	Annualized standard deviation of monthly stock returns (Datastream).
Stock Return	Stock return (Datastream item RI).
Return on Assets	Ratio of net income before extraordinary items plus interest expenses to total assets (Worldscope (item 01551 + item 01151)/item 02999).
Voting Dissent	Percentage of votes against management's recommendation on executive compensation proposals at shareholder meetings (Institutional Shareholder Services/RiskMetrics).

Table A.I—*Continued*

Variable	Definition
Lender-Affiliated Funds Ownership	Institutional ownership by funds affiliated with commercial banks chosen by a firm as lead arrangers of a loan over the past three years as a percentage of market capitalization (DealScan and FactSet).
Nonlender-Affiliated Funds Ownership	Institutional ownership of funds affiliated with commercial banks not chosen by a firm as lead arrangers of a loan over the past three years as a percentage of market capitalization (DealScan and FactSet).
Unaffiliated Funds Ownership	Institutional ownership of funds unaffiliated with commercial banks as a percentage of market capitalization (FactSet).
Institutional Ownership	Institutional ownership of all institutions as a percentage of market capitalization (FactSet).
Insider Ownership	Number of shares held by insiders as a proportion of the number of shares outstanding (WorldScope item 08021).
Fund Manager Turnover	Dummy variable that takes a value of 1 if the fund manager is replaced in a quarter, and 0 otherwise (Lipper).
Fund Manager Tenure	Number of years as fund manager at the current fund (Lipper).
Rank	Fractional rank that ranges from 0 (poorest performance) to 0 (best performance) assigned to funds within each country according to their average Carhart (1997) four-factor model over the past four quarters (Lipper).

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Internet Appendix.