

Internet Appendix
“Prime (Information) Brokerage”

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Part A. Analysis Based on 13F Option Holdings Data

Part B. Tables for Additional Robustness Tests

Part C. Media Reports on Hedge Fund-Investment Bank Relationship

Part A. Analysis Based on 13F Option Holdings Data

In this analysis, we test our main hypothesis using hedge funds' equity option holdings from their 13F filings. Equity option holdings provide an additional setting to test our hypothesis. It also allows us to ensure that our results are not ignoring potentially profitable trading in derivatives by hedge funds. In particular, we use hedge funds' trades (i.e., quarterly holding changes) of call and put options to determine whether connected funds trade more profitably in securities of firms that receive loans from their prime broker banks.¹

Our data on hedge fund firms' equity option holdings comes from WhaleWisdom, which obtains the data on 13F institutional holdings directly from the SEC EDGAR database. According to the 13F disclosure rules for holdings of equity options, institutional investors need to report the number of shares and fair value in terms of the stock underlying the options, not the options themselves. In addition, the strike price and expiration date of the options are not required to be disclosed.² Following prior literature (e.g., Aragon and Martin, 2012), we carry out our analysis based on the number of shares in terms of the stock underlying the options, rather than the options themselves.

We estimate trade profitability in the same way as in our prior analyses, by multiplying a hedge fund's change in exposure to the stock underlying the option positions by the stock's abnormal return in the next quarter. To calculate a fund's change in exposure to the stock underlying the options, we divide the changes in the value of underlying shares by the hedge fund firm's total AUM. Because options represent leveraged positions (i.e., option delta typically being less than one), the average size for these trades in terms of underlying stock is significantly higher than that of the funds' equity trades (see Panel A of Table IA.13). If we assume the delta of all option positions is 0.5 (roughly at the money), then actual trade profits from the option positions equal half the size of our trade profitability measure based on the value of the stock underlying the options.

Specifically, we estimate the following regression:

¹ In 3,505 out of the 11,619 (about 30.17%) distinct fund-quarters in our sample, hedge fund firms hold at least one equity option position.

² See Items 11 and 12 of "SPECIAL INSTRUCTIONS" of the SEC instruction file for 13F Form: <https://www.sec.gov/about/forms/form13f.pdf>.

$$y_{i,j,t} = \beta_1 * Call_{i,j,t} * Loan_{i,j,t} + \beta_2 * Put_{i,j,t} * Loan_{i,j,t} + \lambda * Call_{i,j,t} + \gamma_{i,t} + \kappa_{j,t} + \eta_{i,j,t}, \quad (A.1)$$

where $y_{i,j,t}$ represents the profitability of fund i 's trade in stock j in quarter t ; $Loan_{i,j,t}$ is an indicator variable equal to one if hedge fund company i 's prime broker bank makes a loan as a lead arranger to stock j in the subsequent quarter, i.e., quarter $t+1$; $Call$ is an indicator variable equal to one for observations in which fund i held call options for stock j in quarter t and zero otherwise; and Put is an indicator variable equal to one for observations in which fund i held put options for stock j in quarter t and zero otherwise.

We report the estimation results in Panel B of Table IA.13. It shows that connected funds' call option trades in firms receiving loans from their prime broker banks are significantly more profitable compared to the control groups, though the profitability of their trades of put options is not statistically different from the control groups. Overall, this evidence provides further evidence that connected hedge funds gain an informational advantage from their prime broker banks.

Part B. Tables for Additional Robustness Tests

Table IA.1 – Variable Definitions and Summary Statistics

Panel A of this table presents the definitions of the additional variables we use in the analysis that includes only one set of high-dimensional fixed effects, either fund company \times quarter or stock \times quarter fixed effects. Panel B of this table reports summary statistics for the hedge fund company variables at the fund company \times quarter level. Panel C contains summary statistics for the stock holding variables at the individual holding level. All variables are winsorized at the 1% and 99% levels.

Panel A. Variable Definitions

Variable	Description
Fund company variables	
<i>Number of Stocks Held</i>	The total number of stocks disclosed in the fund company's 13F filing in a given quarter.
<i>Fund Returns</i>	The average of the annual returns of the hedge funds managed by a fund company.
<i>Fund Flows</i>	The average of annual percentage flows of the hedge funds managed by a fund company.
<i>Fund Size</i>	The total assets under management of the hedge funds managed by a fund company.
<i>Management Fee</i>	The average management fee charged by the hedge funds managed by a fund company.
<i>Incentive Fee</i>	The average incentive fee charged by the hedge funds managed by a fund company.
<i>Lockup Period</i>	The average lockup period, in months, enforced by the hedge funds managed by a fund company.
<i>High Water Mark</i>	The percentage of hedge funds managed by a fund company that have a high water mark provision.
<i>Offshore</i>	The percentage of hedge funds managed by a fund company that are domiciled offshore.
Stock-holding variables	
<i> ΔOwnership </i>	The absolute value of the change of a fund company's AUM for a given stock holding.
<i>Momentum</i>	The cumulative stock return for the prior six months.
<i>Institutional Ownership</i>	The percentage of shares outstanding owned by 13F institutions
<i>Market Capitalization</i>	The total number of shares outstanding multiplied by current share price.
<i>Amihud</i>	Monthly average of the square root of the absolute value of the daily return over daily dollar volume (scaled by 10^6).
<i>Book-to-Market</i>	The ratio of the book value of equity (assumed to be available six months after the fiscal year end) over month-end market capitalization.

Panel B. Fund Company Control Variables

	N	Mean	Std. Dev	Distribution		
				10th	50th	90th
Fund Returns	10,918	9.28%	15.93%	-6.89%	8.19%	27.63%
Fund Flow	10,812	0.99%	3.65%	-2.73%	0.22%	5.62%
Lockup Period (months)	10,918	9.59	5.69	3.00	12.00	12.00
Management Fee	10,911	1.36%	0.37%	1.00%	1.43%	20.00%
Incentive Fee	10,911	18.62%	3.55	15.00	20.00	20.00
High Water Mark	10,886	0.85	0.31	0.22	1.00	1.00
Offshore	10,918	0.35	0.40	0.00	0.15	1.00

Panel C. Stock Holding Control Characteristics

	N	Mean	Std. Dev	Distribution		
				10th	50th	90th
Momentum	1,812,993	7.62%	34.66%	-30.93%	5.25%	45.36%
Institutional Ownership	1,668,558	0.69	0.23	0.36	0.73	0.95
Market Capitalization (\$ million)	1,813,244	13729.0	32740.3	199.6	2284.5	34119.3
Amihud	1,813,238	0.07	0.39	0.00	0.00	0.04
Book-to-Market	1,808,164	0.57	0.56	0.13	0.42	1.12

Table IA.2 – Performance of Hedge Fund Trades: Same Fund, Different Stocks

This table reports results that compare the size and returns of hedge fund trades in stocks of firms that do and do not receive loans from their prime broker banks. Trade size is calculated as the absolute change in ownership (in percentage points of assets under management). We calculate trade returns as $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. Panel A reports the univariate results and Panel B reports the results of multivariate regressions with stock-quarter level controls and fund company \times quarter fixed effects. The variable of interest is *Loan*, an indicator variable equal to one if hedge fund company i 's prime broker bank initiates a loan to stock j in quarter $t+1$, and zero otherwise. The stock-level control variables are defined in Table IA.1 of the Internet Appendix. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A. Univariate Tests

	\Delta Ownership	Four-Factor Alpha \times \Delta Ownership	DGTW \times \Delta Ownership
Loan Stocks	0.496	0.334	0.331
No Loan Stocks	0.325	0.063	0.067
Difference	0.171***	0.271***	0.264***
p -value of Difference	0.000	0.004	0.003

Panel B. Multivariate Regressions

	(1)	(2)	(3)
	\Delta Ownership	Four-Factor Alpha \times \Delta Ownership	DGTW \times \Delta Ownership
Loan	0.058*** (3.95)	0.319*** (3.78)	0.306*** (3.58)
Log(1 + Market Cap.)	0.055*** (10.04)	-0.004 (-0.62)	-0.007 (-1.33)
Book-to-Market	-0.002 (-0.77)	-0.010 (-0.60)	-0.005 (-0.35)
Amihud	0.000 (0.40)	-0.003 (-1.42)	-0.003 (-1.61)
Momentum	0.000*** (3.41)	-0.001 (-0.72)	-0.000 (-0.40)
Inst. Ownership	0.104*** (4.34)	-0.035 (-0.60)	0.046 (0.66)
Fund Comp. \times Qtr. FE	Yes	Yes	Yes
Observations	1,663,187	1,663,187	1,661,289
Adj. R-squared	0.439	0.018	0.018

Table IA.3 – Performance of Hedge Fund Trades: Same Stock, Different Fund

This table reports results that compare the size and returns of hedge funds trades in stocks of firms that receive loans from their prime broker banks to that of the trades in the same stock of unconnected hedge funds. Trade size is calculated as the absolute change in ownership (in percentage points of assets under management). We calculate trade returns as $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. Panel A reports the univariate results and Panel B reports the results of multivariate regressions with fund-quarter level controls and stock \times quarter fixed effects. The variable of interest is *Loan*, an indicator variable equal to one if hedge fund company i 's prime broker bank initiates a loan to stock j in quarter $t+1$, and zero otherwise. The stock-level control variables are defined in Table IA.1 of the Internet Appendix. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A. Univariate Tests

	$ \Delta Ownership $	Four-Factor Alpha $\times \Delta Ownership$	DGTW $\times \Delta Ownership$
Connected Funds	0.496	0.334	0.331
Unconnected Funds	0.359	0.087	0.108
Difference	0.137***	0.247***	0.223***
p -value of Difference	0.000	0.000	0.000

Panel B. Multivariate Regressions

	(1)	(2)	(3)
	$ \Delta\text{Ownership} $	Four-Factor Alpha $\times \Delta\text{Ownership}$	DGTW $\times \Delta\text{Ownership}$
Loan	0.080** (2.15)	0.254*** (3.10)	0.207** (2.52)
Management Fee	-0.047 (-0.89)	-0.059 (-0.92)	-0.020 (-0.27)
Incentive Fee	0.007* (1.67)	0.011 (1.50)	0.009 (1.25)
Lockup	0.079 (1.54)	0.045 (0.67)	0.053 (0.80)
High Water Mark	0.137*** (2.86)	0.104 (1.02)	0.087 (1.00)
Offshore	0.052 (1.14)	0.063 (1.01)	-0.001 (-0.01)
Flow	-0.424** (-1.99)	-1.541** (-2.46)	-0.764 (-1.42)
Average Return	0.000 (0.59)	0.001 (0.26)	0.002 (0.88)
# Stocks	-0.000*** (-3.76)	-0.000*** (-3.27)	-0.000** (-2.54)
Log(1+AUM)	-0.081*** (-4.74)	-0.021 (-0.98)	-0.041* (-1.92)
Stock \times Qtr. FE	Yes	Yes	Yes
Observations	177,049	177,049	176,878
Adj. R-squared	0.089	0.020	0.020

Table IA.4 – Performance of Hedge Fund Trades: Removing Small Hedge Funds

This table reports the estimation results of Eq. (1) that compare the returns of hedge funds trades in stocks of firms that receive loans from their prime broker banks to returns of the trades in the control groups, except that we enforce minimum fund size restrictions. Trade size is calculated as the absolute change in ownership (in percentage points of assets under management). We calculate trade returns as $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. All regressions are estimated based on Eq. (1) with both fund company \times quarter and stock \times quarter fixed effects. The variable of interest is *Loan*, an indicator variable equal to one if hedge fund company i 's prime broker bank initiates a loan to stock j in quarter $t+1$, and zero otherwise. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	<u>AUM\geq\$100 mill.</u>		<u>AUM\geq\$400 mill.</u>	
	(1)	(2)	(3)	(4)
	Alpha \times $\Delta Ownership$	DGTW \times $\Delta Ownership$	Alpha \times $\Delta Ownership$	DGTW \times $\Delta Ownership$
Loan	0.290*** (3.87)	0.266*** (3.50)	0.291*** (3.85)	0.298*** (3.51)
Fund Comp. \times Qtr. FE	Yes	Yes	Yes	Yes
Stock \times Qtr. FE	Yes	Yes	Yes	Yes
Observations	1,662,347	1,660,563	1,275,614	1,274,272
Adj. R-squared	0.029	0.029	0.014	0.014

Table IA.5 – Broker Characteristics and Performance of Hedge Fund Trades

This table reports the estimation results of Eq. (4) to examine whether the information advantage that hedge funds gain from their prime broker connection is related to the characteristics of their prime brokers. Each quarter, we define the low, medium, and high groups by dividing the sample of brokers into three groups based on the number of loans they initiate or the number of clients they possess. The low group is the bottom quartile, the medium group is the middle two quartiles, and the high group is the top quartile. In Panel A, we compare the performance of connected trades of funds based on the number of clients that their brokers serve. In Panel B, we compare the performance of connected trades for funds based on the number of loans their broker banks make in a given quarter. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and *t*-statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A. Number of Broker Clients

	(1)	(2)
	Four-Factor Alpha \times Δ Ownership	DGTW \times Δ Ownership
Loan \times Low # Clients	0.273** (2.41)	0.256** (2.08)
Loan \times Medium # Clients	0.257** (2.17)	0.185* (1.97)
Loan \times Large # Clients	0.335** (2.64)	0.294** (2.17)
Fund Comp. \times Qtr. FE	Yes	Yes
Stock \times Qtr. FE	Yes	Yes
Observations	1,748,255	1,746,357
Adj. R-squared	0.031	0.032

Panel B. Number of Broker Bank Loans

	(1)	(2)
	Four-Factor Alpha \times Δ Ownership	DGTW \times Δ Ownership
Loan \times Low # Loans	0.818* (1.87)	0.684* (1.69)
Loan \times Medium # Loans	0.203* (1.94)	0.178* (1.68)
Loan \times Large # Loans	0.317*** (3.37)	0.261*** (2.64)
Fund Comp. \times Qtr. FE	Yes	Yes
Stock \times Qtr. FE	Yes	Yes
Observations	1,748,255	1,746,357
Adj. R-squared	0.031	0.032

Table IA.6 – Performance of New vs. Existing Positions

This table examines whether the information edge of connected hedge funds vary based on whether a position represents the first time a fund holds a given stock. The dependent variable in both panels is trade performance defined as the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. We construct an indicator variable, *New Position*, which is equal to one when a fund company holds a given stock for the first time and zero otherwise. We interact *New Position* with the indicator variable, *Loan*. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
	Four-Factor Alpha \times Δ Ownership	DGTW \times Δ Ownership
Loan \times New Position	0.809*** (2.66)	1.176*** (3.97)
Loan	0.219*** (3.25)	0.140** (2.14)
New Position	-0.143*** (-2.98)	-0.056 (-1.23)
Fund Comp. \times Qtr. FE	Yes	Yes
Stock \times Qtr. FE	Yes	Yes
Observations	1,748,255	1,746,357
Adj. R-squared	0.031	0.032

Table IA.7 – Performance of Quant Hedge Fund Trades

This table reports the estimation results of Eq. (4) to compare the performance of connected trades of quantitative funds to that of non-quantitative funds. The dependent variable is trade returns, $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. The indicator variable, $Quant$, equals to one when a hedge fund company is listed as a top quant hedge fund by Street of Walls and zero otherwise. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
	Four-Factor Alpha \times Δ Ownership	DGTW \times Δ Ownership
Loan \times Quant Funds	-0.272*** (-3.72)	-0.238*** (-3.35)
Loan	0.291*** (3.76)	0.246*** (3.15)
Fund Comp. \times Qtr. FE	Yes	Yes
Stock \times Qtr. FE	Yes	Yes
Observations	1,874,546	1,872,537
Adj. R-squared	0.0293	0.0297
Coeff.: Loan + Loan \times Quant Funds	0.019	0.008
p -value	0.603	0.835

Table IA.8 – Loan Announcement Time: First Half vs. Second Half of the Quarter

This table examines whether the returns of hedge fund trades as measured by 13F holding changes vary with the loan announcement time during the quarter. The dependent variable in both panels is trade performance defined as the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. We construct two indicator variables, $Half1$ and $Half2$, which are equal to one for stocks that announce loans in the first and second half of the quarter, respectively, and zero otherwise. We interact each of them with the indicator variable, $Loan$. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
	Four-Factor Alpha \times Δ Ownership	DGTW \times Δ Ownership
Loan \times Half1	0.365*** (3.14)	0.342*** (2.91)
Loan \times Half2	0.227** (2.31)	0.159 (1.55)
Fund Comp. \times Qtr. FE	Yes	Yes
Stock \times Qtr. FE	Yes	Yes
Observations	1,748,255	1,746,357
Adj. R-squared	0.031	0.032

Table IA.9 – Placebo Tests

This table reports results from placebo tests where we repeat the regression analysis in columns (2) and (3) of Table 2, except that we change the loan origination dates to one- or two years prior to the actual dates. We calculate trade returns as $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. All regressions are estimated with both fund company \times quarter and stock \times quarter fixed effects. The variable of interest is *Loan*, an indicator variable equal to one if hedge fund company i 's prime broker bank initiates a loan to stock j in quarter $t+5$ for columns (1) and (2), and quarter $t+9$ for columns (3) and (4), and zero otherwise. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	<u>One Year Prior</u>		<u>Two Years Prior</u>	
	(1)	(2)	(3)	(4)
	Alpha \times $\Delta Ownership$	DGTW \times $\Delta Ownership$	Alpha \times $\Delta Ownership$	DGTW \times $\Delta Ownership$
Loan	0.062 (1.00)	0.069 (1.19)	0.055 (0.66)	0.095 (0.91)
Fund Comp. \times Qtr. FE	Yes	Yes	Yes	Yes
Stock \times Qtr. FE	Yes	Yes	Yes	Yes
Observations	1,748,255	1,746,357	1,748,255	1,746,357
Adj. R-squared	0.045	0.049	0.045	0.049

Table IA.10 – Bank Misconduct and Information Sharing

This table reports the estimation results of Eq. (4) to examine whether connected hedge funds' outperformance is larger when their prime broker banks are more prone to engage in misconduct as reported in the BrokerCheck Report from the Financial Industry Regulatory Authority (FINRA). The dependent variable is trade returns, $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. We use the total number of regulatory, or regulatory plus civil, event disclosures, scaled by the bank's market capitalization, as our measure for the propensity to engage in misconduct. The variables of interest is $High\ Misconduct \times Loan$. $High\ Misconduct$ is an indicator variable that equals one for the prime broker banks that are in the top quartile of BrokerCheck event disclosures and zero otherwise. The analysis uses fund company \times quarter and stock \times quarter fixed effects. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	<u>BrokerCheck Violation =</u> <u>Regulatory</u>		<u>BrokerCheck Violation =</u> <u>Civil or Regulatory</u>	
	(1)	(2)	(3)	(4)
	Alpha \times $\Delta Ownership$	DGTW \times $\Delta Ownership$	Alpha \times $\Delta Ownership$	DGTW \times $\Delta Ownership$
Loan \times High Misconduct	0.988** (2.27)	0.689** (2.07)	0.553** (2.10)	0.361* (1.72)
Loan	0.127*** (2.70)	0.088* (1.84)	0.136*** (2.82)	0.095* (1.92)
Fund Comp. \times Qtr. FE	Yes	Yes	Yes	Yes
Stock \times Qtr. FE	Yes	Yes	Yes	Yes
Observations	1,687,499	1,685,643	1,687,499	1,685,643
Adj. R-squared	0.030	0.030	0.030	0.030

Table IA.11 – Information Content about Loan vs. Firm: Robustness Analysis

This table reports results of our investigation of whether the information that connected hedge funds have is specific about the loan or the firm in general. To test this idea, we repeat the analysis in columns (2) and (3) of Table 2 except that we either use i) the loan announcement return from the treated stock, or ii) the quarterly return minus the loan announcement return as our measure of abnormal return. In Panel A, we use a five-day loan announcement window, whereas in Panel B, we use a seven-day loan announcement window. For the alpha measure, the five- and seven-day CAR are computed using the four-factor model using five and seven days respectively, while for the DGTW measure, we calculate the five- and seven-day CAR as cumulative stock return minus cumulative DGTW portfolio return for those five and seven days respectively. The dependent variable is trade performance, measured by the product of hedge fund company i 's portfolio weight change in stock j in quarter t and the subsequent quarter stock abnormal return (either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return). Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A. Five-Day Loan Announcement Return

	<u>Loan Announcement CARs</u>		<u>Quarterly Return minus CARs</u>	
	(1)	(2)	(3)	(4)
	Alpha × ΔOwnership	DGTW × ΔOwnership	Alpha × ΔOwnership	DGTW × ΔOwnership
Loan	0.029* (1.90)	0.032** (2.11)	0.263*** (3.52)	0.212*** (2.92)
Fund Comp. × Qtr. FE	Yes	Yes	Yes	Yes
Stock × Qtr. FE	Yes	Yes	Yes	Yes
Observations	1,748,255	1,746,357	1,748,255	1,746,357
Adj. R-squared	0.084	0.088	0.031	0.032

Panel B. Seven-Day Loan Announcement Return

	<u>Loan Announcement CARs</u>		<u>Quarterly Return minus CARs</u>	
	(1)	(2)	(3)	(4)
	Alpha × ΔOwnership	DGTW × ΔOwnership	Alpha × ΔOwnership	DGTW × ΔOwnership
Loan	0.057*** (3.42)	0.052*** (3.09)	0.234*** (3.16)	0.191*** (2.66)
Fund Comp. × Qtr. FE	Yes	Yes	Yes	Yes
Stock × Qtr. FE	Yes	Yes	Yes	Yes
Observations	1,748,255	1,746,357	1,748,255	1,746,357
Adj. R-squared	0.085	0.088	0.031	0.032

Table IA.12 – Do Connected Funds’ Trades Predict Earnings Surprises?

This table reports the results of the analysis that uses connected funds’ trades to predict future earnings surprises and disclosure intensity. In particular, in columns (1) and (2), we regress the earnings surprise variables of loan stocks on i) the total net shares traded by connected funds, and ii) the total net shares traded by nonconnected funds, both scaled by the stock’s shares outstanding. We also include various stock control variables such as market capitalization, book-to-market ratio, and momentum, and quarter fixed effects. In columns (3)-(6), since 8-K information intensity variables do not have a positive or negative direction, we use the absolute value of the total net shares traded by connected funds and by nonconnected funds (both scaled by the stock’s shares outstanding) as regressors. Standard errors are adjusted for heteroscedasticity and double clustered by stock and quarter, and *t*-statistics are reported below the coefficients in parentheses. The bottom row of the table reports the p-value of the F-test on the difference between the two coefficients. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	<u>Earnings Surprise</u>		<u>8-K Filing #</u>		<u>8-K Filing Size</u>	
	(1)	(2)	(3)	(4)	(5)	(6)
Trades of Connected Funds	0.196** (2.33)	0.185** (2.12)	2.690** (2.64)	2.400** (2.30)	7.477*** (2.94)	6.325** (2.41)
Trades of Nonconnected Funds	0.021 (1.02)	0.002 (0.10)	-0.581 (-1.35)	-0.696 (-1.13)	-3.743** (-2.10)	-3.883 (-1.53)
Stock-level controls	No	Yes	No	Yes	No	Yes
Qtr. FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,179	7,146	6,863	6,542	6,863	6,542
Adj. R-squared	0.008	0.010	0.128	0.142	0.078	0.089
Diff: Connected – Nonconnected						
<i>p</i> -value	0.040	0.036	0.006	0.018	0.002	0.012

Table IA.13 – Equity Options Trading of Hedge Funds

Panel A of this table reports summary statistics of hedge fund trading in equity options based on data from 13F filings. $\Delta Ownership$ measures a fund’s change in exposure to the stock underlying the options. To calculate it, we divide the changes in the value of underlying shares by the hedge fund firm’s total AUM. Other variables are defined the same way as in Table 1. Panel B of this table reports the estimation results of Eq. (A.1) to examine whether the information advantage that hedge funds gain from their prime broker connections is also present in their trading of option securities. The dependent variable is trade returns, $\Delta Ownership_{i,j,t} \times Return_{j,t+1}$, that is, the product of hedge fund company i ’s portfolio weight change in exposure to stock j underlying the options in quarter t and the subsequent quarter stock abnormal return. $Return_{j,t+1}$ is either the cumulative Carhart (1997) four-factor alpha or DGTW-adjusted return for stock j over the quarter $t+1$. $Call$ is an indicator variable equal to one for fund-stock-quarter observations in which a fund held call options and zero otherwise. Put is an indicator variable equal to one for fund-stock-quarter observations in which a fund held put options and zero otherwise. Standard errors are adjusted for heteroscedasticity and clustered by fund company, stock, and quarter, and t -statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A. Summary Statistics

	N	Mean	Std. Dev	Distribution		
				10th	50th	90th
$\Delta Ownership$	104,188	−0.043%	5.737%	−0.498%	0.000%	0.506%
Call	104,188	51.62%	49.97%	0.00%	100.00%	100.00%
Four-Factor Alpha	104,188	0.05%	19.08%	−19.18%	0.04%	19.18%
DGTW	104,100	0.10%	18.76%	−18.96%	0.07%	19.13%
Alpha \times $\Delta Ownership$ (basis point)	104,188	0.22	75.27	−4.17	0.00	4.12
DGTW \times $\Delta Ownership$ (basis point)	104,100	0.16	74.61	−4.05	0.00	4.03

Panel B. Regression Results

	(1) Four-Factor Alpha \times $\Delta Ownership$	(2) DGTW \times $\Delta Ownership$
Loan \times Call	11.515*** (4.01)	17.104*** (3.76)
Loan \times Put	−6.232 (−1.36)	−7.949 (−1.32)
Call	−0.021 (−0.12)	−0.031 (−0.17)
Fund Comp. \times Qtr. FE	Yes	Yes
Stock \times Qtr. FE	Yes	Yes
Observations	92,759	92,687
R-squared	0.207	0.210

Part C. Media Reports on Hedge Fund-Investment Bank Relationship

Anecdotal evidence suggests that hedge funds are important clients of investment banks and pay substantial fees for prime brokerage services. In return, hedge fund clients often receive preferential access to broader resources and services of the bank. Concerns have been raised that banks may bend over backward and engage in questionable practices to please these clients. We show below excerpts from media reports detailing some exclusive services provided by investment banks to their prized clients and raising concerns about certain practices at investment banks.

“Who wants to be a billionaire?” by Hal Lux, *Institutional Investor*, June 1, 2002. ([weblink](#))

- Morgan Stanley & Co. kicked off its invitation-only hedge fund conference in January with a dinner at the Breakers Hotel in Palm Beach. As the plates were being cleared, the 150 or so guests - a who's who of investors in the secretive hedge fund world - awaited a presentation on stocks by the firm's stock market strategist, Byron Wien. ...Morgan Stanley's annual do at the Breakers is arguably the hedge fund world's answer to Mrs. Astor's ball. The firm even enlisted chairman Philip Purcell as a glad-hander. Morgan Stanley, say hedge fund executives, was inundated this year with hedge fund investors pulling strings to get an invitation to the exclusive event. ...At Goldman's April 2001 European hedge fund dinner - at the aquarium in Monte Carlo - Karel Van Miert, former European Union competition commissioner, gave a long-winded but prescient talk. He explained in some detail to attentive arbitrageurs in the audience why the then-pending General Electric Co.-Honeywell International merger might violate EU antitrust rules. The deal was killed soon after by Van Miert's successor as competition commissioner, Mario Monte.
- The business is equally lucrative for Wall Street. With their appetite for leverage and their typically frenetic trading styles, hedge funds can generate more than \$10 million in annual investment banking revenue just in basic brokerage and financing services for every billion dollars that the funds have under management. ... Goldman Sachs and Morgan Stanley, two firms dueling it out with longtime leader Bear, Stearns & Co. to be the leading brokerage to hedge funds, are each estimated to generate at least \$600 million in hedge-fund-related revenue annually.

“Banks woo funds with private peeks,” by David Enrich and Dana Cimilluca, *The Wall Street Journal*, May 11, 2011. ([weblink](#))

- Investment banks vie for business from elite hedge funds by offering traders at those funds special access to senior deal makers and corporate executives at dinners and other gatherings. The traders sometimes pick up valuable nuggets of information that aren't available to other investors, according to people who have attended such gatherings.

- The meetings are held by many of the world’s largest investment banks for their hedge-fund clients. The funds are prized clients because they collectively pay billions of dollars in fees each year for buying and selling stocks. ...Representatives of the banks say their investment bankers aren’t permitted to discuss material nonpublic information, and that the meetings serve a legitimate business purpose. In addition to helping the banks win trading business, the get-togethers allow the bankers and corporate executives to cultivate relationships with the hedge funds, the banks say. ...But the longstanding practice is coming under fresh scrutiny as regulators in the U.S. and U.K. try to discourage the dissemination of market-sensitive information to select groups of investors. Amid intensified scrutiny of insider trading, the U.S. Securities and Exchange Commission recently warned some banks that they need to be careful that such meetings don’t result in the improper exchange of privileged information, according to people familiar with the matter. ...It is unclear how often useful trading information is disseminated in the meetings. The meetings appear to have made some banks nervous. Goldman Sachs Group Inc.’s compliance department last year barred its brokers from arranging dinner meetings between Goldman’s bankers and outside hedge-fund traders, say people familiar with the matter. Bank of America’s investment-banking arm, Bank of America Merrill Lynch, this year cut down on the gatherings after the SEC expressed concern, although it still allows them in some circumstances, according to people familiar with the matter.
- The increased scrutiny comes as prosecutors in the U.S. and U.K. are pursuing a variety of insider trading cases, some involving information that hedge funds allegedly received from officials at banks and through so-called expert networks. ... Many banks nevertheless continue to hold closed-door meetings with hedge funds on a regular basis, according to traders, bankers and other industry officials. Banks try to differentiate themselves from rivals by dangling access to key players – coveted by hedge funds, for which incremental bits of information can be extremely valuable.
- Many banks enlist their senior investment bankers to attend dinners and other private gatherings with hedge-fund traders. Last September and October, for example, Credit Suisse held about a dozen meetings for small groups of investors. Each meeting featured a senior Credit Suisse banker with expertise in a specific industry, who was available to answer questions from the hedge-fund officials. ...Spokesmen for some of the banks say that to ensure nonpublic information isn’t improperly shared, the gatherings are chaperoned by bank compliance officials who vet traders’ questions in advance. Several bankers and traders who regularly attend such meetings dispute that characterization. They say compliance officials are rarely present. The discussions, they say, often are free-wheeling and delve into the latest chatter about companies that are in play. Some bankers say the meetings make them uncomfortable because they feel under pressure from the investors to divulge sensitive information. “It made me congenitally nervous,” said a banker who until recently worked at a top Wall Street investment bank. “It certainly should be on [regulators’] radar.” “There’s

clearly an element of risk in it,” another banker said. “You’re relying on a banker’s judgment and on him not having too much to drink.”

- Hedge funds are a big business for banks. U.S. and European hedge funds last year shelled out a total of about \$3.7 billion in brokerage commissions to banks for equity trades, according to research firm Greenwich Associates. ...“If you can provide your client with good information, that distinguishes you,” one banker says. The meetings with bankers and corporate executives are useful not just for the information gleaned over dinner. Afterwards, traders sometimes phone their new acquaintances, peppering them with questions about specific deals.

“Surveys give big investors an early view from analysts,” by Gretchen Morgenson, *The New York Times*, July 15, 2012. ([weblink](#))

- They are supposed to be among Wall Street’s most closely guarded secrets: changes in research analysts’ views, up or down, of a company’s prospects. But some of the nation’s biggest brokerage firms appear to be giving a handful of top hedge funds an early peek at these sentiments — allowing them to trade on the information before other investors get the word. The signals come from questionnaires that analysts answer and submit electronically, either monthly or quarterly, to some of their firms’ largest hedge fund clients. Chief among the questions posed to the analysts are those about possible earnings surprises at companies they follow.
- But documents obtained by The New York Times indicate that the hedge fund practice of trawling for analysts’ shifting views is systematic and growing on Wall Street. Questionnaires completed by analysts that can telegraph their thinking are being used by hedge funds run by BlackRock and Two Sigma Investments, a United States hedge fund concern. The funds say they ask only for public information, but in at least four cases, documents from Barclays Global Investors, now a unit of BlackRock, state the goal is to receive nonpublic information. Two documents state that the surveys allow for front-running analyst recommendations.
- Analysts at many companies, including Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, JPMorgan Chase, Merrill Lynch and UBS, have participated in the programs. The analysts’ answers are fed into the hedge funds’ trading algorithms, determining which stocks to buy or sell. As one of the largest payers of trading commissions to Wall Street, BlackRock is a client that brokerage firms want to please to keep those commissions flowing. For a period during 2008 and 2009, the firms participating in an expanded survey received cash based on their results. BlackRock Scientific Active Equity, the money management unit that was part of Barclays Global Investors before it was bought by BlackRock in 2009, has been a leader in these surveys. One of the company’s survey questions, titled “earnings surprise direction,” asks analysts whether a company’s coming profits “are more likely to surprise on the upside or downside.” Another asks: “Do you think the current consensus earnings forecast” for a

specified period “will likely move upwards or downwards?” A more recent question involves takeovers: “How likely is it that the company will be taken over in the next 6 months?”

- The BlackRock surveys are careful to ask that analysts supply only those views that they have already stated publicly. But in various confidential documents describing the surveys, company officials state that nonpublic information is what they are after. “We expect the earnings surprise direction to be able to capture the information not released to the market,” stated a confidential BlackRock memo from November 2008, detailing its analyst surveys of nine brokerage firms in Asia. “The question may give the clue on the direction of the analyst’s future revisions.” A 2009 document on the firm’s analyst surveys is even more explicit. “We are trying to front-run recs,” it said, referring to trading ahead of analysts’ recommendations.