Appendix for Online Publication

"Liquidity Support in Financial Institutions"

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Abstract

This Online Appendix includes tables and figures referred to but not included in the main body of the paper, which provide robustness checks and additional findings.

A. Asset Sales: Variable Definitions

This section provides detailed definitions of the variables used in Section 7.3 to measure forced sales by distressed funds. Unless otherwise noted, all variables are constructed at the *fund-quarter* level.

1. **Actual Sales**: Following Coval and Stafford (2007), we define actual sales as the total volume of stock-level reductions in a fund's holdings, scaled by total trading volume:

$$\text{Sales}_{i,t} = \sum_{j} \frac{\max(0, -\Delta \text{w}_{i,j,t})}{\text{Volume}_{j,t}},$$

where:

- i indexes mutual funds, j indexes individual stocks, and t denotes quarters.
- $\Delta \text{w}_{i,j,t}$ is the change in the euro value of holdings of stock j by fund i from $t-1$ to t.
- $\text{Volume}_{j,t}$ is the total euro trading volume of stock j in quarter t.

This measure captures overall liquidation activity within a fund.[1]

2. **Excess Sales**: Excess sales are defined as the deviation of actual sales from expected sales that benchmarks the volume of flow-induced sales:

$$\text{Excess Sales}_{i,t} = \text{Sales}_{i,t} - \text{Expected Sales}_{i,t}.$$

A negative value indicates that the fund sold *less* than expected given outflows, potentially due to liquidity support. In contrast, a positive value, where sales exceed expectations, suggests heightened pressure or the absence of mitigating factors.

To construct expected sales, we adapt the "pressure" concept of Edmans et al. (2012)

[1] Coval and Stafford (2007) constructs a stock-level pressure measure using sales by distressed funds (bottom decile of total flows) to examine price impact at the stock level. We simply adapt their framework to the fund-level sales and focus on outflows from ***outside*** investors to assess the magnitude of total fund-level sales.

to the fund level:

$$\text{Expected Sales}_{i,t} = \sum_j \left(\frac{|\text{Flow}_{i,t}| \times \text{Shares}_{i,j,t-1} \times \text{Price}_{j,t-1}}{\text{Volume}_{j,t}} \right),$$

where:

- $\text{Flow}_{i,t} = \frac{\text{Euro Flow}_{i,t}}{\text{TNA}_{i,t-1}}$ is the absolute value of net outflows from outside investors scaled by lagged total net assets.
- $\text{Volume}_{j,t}$ is the euro trading volume of stock j in quarter t
- $\text{Shares}_{i,j,t-1}$ and $\text{Price}_{j,t-1}$ denote, respectively, the number of shares held and the price of stock j by fund i at the end of quarter $t-1$.

Expected sales assume proportional liquidation across holdings and reflect an expected amount of trading mechanically implied by redemptions.

Wardlaw (2020) raises concerns regarding return endogeneity and small-cap bias in the expected sale measure of Edmans et al. (2012).[2] To address these concerns, we also construct a share-based version of the above measures:

$$\text{Expected Sales}^{\text{Shares}}_{i,t} = \sum_j \left(\frac{|\text{Flow}_{i,t}| \times \text{Shares}_{i,j,t-1}}{\text{SharesOut}_{j,t-1}} \right),$$

$$\text{Actual Sales}^{\text{Shares}}_{i,t} = \sum_j \frac{\max(0, -\Delta\text{Shares}_{i,j,t})}{\text{SharesOut}_{j,t-1}},$$

where $\text{SharesOut}_{j,t-1}$ denotes the total shares outstanding of stock j at the start of quarter t. The excess sale is again the difference between actual and expected sales. These measures capture liquidation activity independently of price fluctuations or portfolio weights.

[2]The reliance of the measure on dollar trading volume introduces a return component, which can contaminate identification when the measure is used as a shock to explain stock returns. Moreover, its construction leads to systematic overweighting of small-cap stocks in high-pressure deciles due to minimum investment scales imposed by mutual funds. However, our pressure-based expected sales measure is constructed at the fund level and used to explain fund-level trading behavior, not stock returns. As such, the mechanical return-scaling and size-premium issues are indeed less relevant to our analysis.

B. Additional Tables and Figures

Table O.A.1: Addressing Endogeneity Concerns: Bank-fund level Switcher Analysis

This table reports coefficient estimates from quarterly OLS regressions examining whether banks' liquidity support differs between treated and untreated funds when a mutual fund company is acquired by a universal bank. The sample is restricted to banks that experienced such acquisitions (two cases) over the period from Q1 2010 to Q2 2021. The dependent variable is $Flow_t^{Insider}$, defined as the normalized quarterly flows from the acquiring bank. The variable *Treated* equals 1 if a fund changes its affiliation during the sample period and 0 otherwise, while *Post* equals 1 after the change in affiliation status and 0 otherwise. The control group consists of funds that were never affiliated with the parent bank. All regressions include standard fund-level controls (omitted from the table for readability). Columns (1)–(4) vary the fixed effects: bank and quarter FEs (column 1), bank-by-quarter FEs (column 2), fund-by-year FEs (column 3), and fund-by-year plus quarter FEs (column 4). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Dependent Variable: $Flow_t^{Insider}$			
	(1)	(2)	(3)	(4)
$Flow_t^{Outsider}$ (β_1)	0.0465***	0.0465***	0.0439***	0.0467***
	(3.59)	(3.56)	(3.02)	(3.19)
Distress	-0.0037 **	-0.0038 **	-0.00214	-0.0018
	(-2.29)	(-2.27)	(-1.38)	(-1.24)
Distress × $Flow_t^{Outsider}$ (β_3)	-0.0430***	-0.0438***	-0.0474***	-0.0499***
	(-3.13)	(-3.21)	(-2.98)	(-3.09)
Treated	0.00722*	0.0070*	-0.0009	-0.0012
	(1.89)	(1.90)	(-0.15)	(-0.33)
Treated × $Flow_t^{Outsider}$ (β_5)	0.0892*	0.0891*	0.0700*	0.0677*
	(1.71)	(1.71)	(1.78)	(1.75)
Distress × Treated	-0.0099	-0.0089	-0.0069	-0.0067
	(-0.91)	(-0.84)	(-0.83)	(-0.81)
Distress × Treated × $Flow_t^{Outsider}$ (β_7)	-0.110	-0.0973	-0.0728	-0.0738
	(-0.76)	(-0.67)	(-0.71)	(-0.73)
Post	0.0053**		0.0014	0.0067**
	(2.16)		(0.81)	(2.66)
Post × $Flow_t^{Outsider}$ (β_9)	0.0146	0.0145	0.0263	0.0246
	(0.91)	(0.89)	(1.33)	(1.25)
Distress × Post	0.0002	0.0004	-0.0013	-0.0020
	(0.09)	(0.16)	(-0.49)	(-0.80)
Distress × Post × $Flow_t^{Outsider}$ (β_{11})	0.0381	0.0390	0.0073	0.0078
	(1.29)	(1.31)	(0.24)	(0.26)
Treated × Post	0.0006	0.0012	0.0176*	0.0182*
	(0.13)	(0.29)	(1.85)	(1.87)
Treated × Post × $Flow_t^{Outsider}$ (β_{13})	0.123*	0.121	0.0642	0.0650
	(1.68)	(1.66)	(1.24)	(1.28)
Distress × Treated × Post	-0.0348**	-0.0344**	-0.0264*	-0.0268**
	(-2.11)	(-2.15)	(-2.01)	(-2.04)
Distress × Treated × Post × $Flow_t^{Outsider}$ (β_{15})	-0.605***	-0.607***	-0.511***	-0.506***
	(-2.89)	(-2.93)	(-3.10)	(-3.12)
No of Obs	12,994	12,994	12,723	12,723
R-squared	0.2927	0.2971	0.6308	0.6341
Controls	Yes	Yes	Yes	Yes
Bank FEs	Yes	No	No	No
Quarter FEs	Yes	No	No	Yes
Bank × Quarter FEs	No	Yes	No	No
Fund x Year FEs	No	No	Yes	Yes
Wald Test for $\cdots$				
$\cdots$ β_1+β_3+β_5+β_7+β_9+β_{11}+β_{13}+β_{15}=0 (p-value)	< 0.01	< 0.01	< 0.01	< 0.01

Table O.A.2: Bank Support via the Direct Flow Channel: Alternative Definition of Distress

Similar to Table 2, this table reports coefficient estimates from quarterly OLS regressions examining whether banks provide liquidity to affiliated mutual funds in distress. The sample period is from Q1 2010 to Q2 2021. Columns (1)–(2) define $Distress$ each quarter following Coval and Stafford (2007), while Columns (3)-(4) define $Distress$ as a dummy equal to one if outsider flows fall into the bottom three deciles (see Figure 1). Controls include lagged insider and outsider flows, cash share, leverage, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and return volatility (12 months). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Dependent Variable: $Flow_t^{Insider}$			
	(1)	(2)	(3)	(4)
$Flow_t^{Outsider}$ (β_1)	0.0057	0.0054	0.0052	0.0077
	(0.33)	(0.31)	(0.29)	(0.42)
Distress (β_2)	-0.0139***	-0.0131***	-0.0077***	-0.0055***
	(-3.77)	(-3.47)	(-4.97)	(-3.65)
Distress $\times$ $Flow_t^{Outsider}$ (β_3)	-0.1965***	-0.1953***	-0.1753***	-0.1754***
	(-4.39)	(-4.48)	(-4.13)	(-4.27)
$Flow_{t-1}^{Insider}$	0.1835***	0.1734***	0.1834***	0.1735***
	(4.78)	(4.58)	(4.78)	(4.57)
$Flow_{t-1}^{Outsider}$	0.0304***	0.0292***	0.0309***	0.0301***
	(3.76)	(3.74)	(3.81)	(3.82)
Cash deposits share	-0.0186***	-0.0123*	-0.0183***	-0.0119*
	(-2.95)	(-1.98)	(-2.89)	(-1.91)
Leverage	-0.1997***	-0.2083***	-0.1950***	-0.2054***
	(-2.79)	(-2.75)	(-2.75)	(-2.73)
Age in logs	-0.0038***	-0.0041***	-0.0037***	-0.0040***
	(-3.93)	(-3.77)	(-3.83)	(-3.73)
Fund size in logs	0.0015***	0.0014***	0.0015***	0.0014***
	(3.10)	(3.03)	(3.07)	(3.11)
Expense ratio	0.0362	0.0650	0.0361	0.0644
	(0.58)	(0.95)	(0.58)	(0.94)
Family size in logs	0.0018***	0.0008	0.0018***	0.0007
	(3.12)	(0.32)	(3.20)	(0.28)
Past performance	0.0031	0.0141***	0.0034	0.0144***
	(0.67)	(3.16)	(0.73)	(3.21)
Past volatility	-0.0297	-0.0330	-0.0310	-0.0357
	(-1.18)	(-1.50)	(-1.23)	(-1.59)
No of Obs	24,932	24,932	24,932	24,932
R-squared	0.0733	0.0882	0.0724	0.0875
Family FEs	No	Yes	No	Yes
Quarter FEs	No	Yes	No	Yes
Wald Test for $\cdots$				
$\cdots$ β_1+β_3=0 (p-value)	< 0.01	< 0.01	< 0.01	< 0.01

Table O.A.3: Bank Support via the Direct Flow Channel: Sample Filters

This table reports coefficient estimates from quarterly OLS regressions examining whether banks provide liquidity to affiliated mutual funds in distress. We use the specification from Column (4) of Table 2 and apply different sampling filters. Columns (1)-(2) expand the sample to include fixed income funds and all fund categories, respectively. Column (3) adds target and index equity and allocation funds to the original sample. Columns (4)-(5) exclude funds with total net assets below EUR 1 million and EUR 10 million, respectively. Controls include cash share, leverage, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and past volatility (12-month standard deviation of returns). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***.

	Dependent Variable: $Flow_t^{Insider}$				
	(1)	(2)	(3)	(4)	(5)
$Flow_t^{Outsider}$ (β_1)	-0.005	-0.0031	-0.0230	0.0077	0.0058
	(-0.29)	(-0.20)	(-1.26)	(0.50)	(0.29)
Distress (β_2)	-0.0178***	-0.0179***	-0.0151***	-0.0122***	-0.0153***
	(-4.14)	(-4.34)	(-3.16)	(-3.37)	(-3.63)
Distress x $Flow_t^{Outsider}$ (β_3)	-0.197***	-0.191***	-0.187***	-0.173***	-0.206***
	(-5.10)	(-5.22)	(-4.30)	(-4.55)	(-4.00)
$Flow_{t-1}^{Insider}$	0.173***	0.191***	0.127***	0.159***	0.178***
	(5.70)	(6.77)	(4.12)	(3.58)	(4.10)
$Flow_{t-1}^{Outsider}$	0.0382***	0.0430***	0.0348***	0.0291***	0.0296***
	(5.19)	(6.38)	(4.47)	(4.10)	(3.75)
Cash deposits share	-0.0143**	-0.0224***	-0.0098	-0.0189***	-0.0073
	(-2.02)	(-3.61)	(-1.53)	(-2.98)	(-1.17)
Leverage	-0.195***	-0.155***	-0.200**	-0.144***	-0.121
	(-3.15)	(-4.14)	(-2.69)	(-4.90)	(-1.44)
Age in logs	-0.0029***	-0.0025***	-0.0041***	-0.0044***	-0.0034***
	(-3.18)	(-3.11)	(-3.41)	(-3.64)	(-3.33)
Fund size in logs	0.0011**	0.0010**	0.0015***	0.0011*	0.0014**
	(2.28)	(2.38)	(2.72)	(1.99)	(2.51)
Expense ratio	0.148**	0.154**	0.178**	-0.0145	0.0482
	(2.03)	(2.15)	(2.16)	(-0.75)	(0.60)
Family size in logs	0.0005	0.0010	0.0010	0.0011	0.0012
	(0.23)	(0.48)	(0.39)	(0.39)	(0.38)
Past performance	0.0184***	0.0202***	0.0144***	0.0155***	0.0118**
	(4.09)	(4.63)	(3.01)	(2.89)	(2.17)
Past volatility	-0.0170	-0.0128	-0.0415*	-0.0332	-0.0270
	(-0.92)	(-0.64)	(-1.80)	(-1.53)	(-1.09)
No of Obs	31,962	36,332	26,591	26,050	22,427
R-squared	0.0773	0.0804	0.0699	0.0786	0.0915
Clustering	Fund Level	Fund Level	Fund Level	Fund Level	Fund Level
Family FEs	Yes	Yes	Yes	Yes	Yes
Quarter FEs	Yes	Yes	Yes	Yes	Yes
Wald Test for $\cdots$					
$\cdots$ β_1+β_3=0 (p-value)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Table O.A.4: Bank Support via the Direct Flow Channel: Pre-COVID vs. Post-COVID time

This table reports coefficient estimates from quarterly OLS regressions examining whether banks provide liquidity to affiliated mutual funds in distress before and during the Covid-19 crisis. Columns (1)-(2) use the pre-Covid sample period, while Columns (3)-(4) restrict the sample to the onset of the pandemic (2020Q1-Q2). The dependent variable is insider flows, computed as the quarterly change in the total value of an affiliated fund's holdings in the bank's combined proprietary and client portfolios. Controls include cash share, leverage, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and past volatility (12-month standard deviation of returns). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***.

	Pre-Covid sample		Covid-19 (2020Q1-Q2)	
	(1)	(2)	(3)	(4)
$Flow_t^{Outsider}$ (β_1)	0.0102	0.0098	-0.0794	-0.0648
	(0.57)	(0.54)	(-1.51)	(-1.49)
Distress (β_2)	-0.0151***	-0.0141***	-0.0023	-0.0133
	(-3.46)	(-3.20)	(-0.10)	(-0.63)
Distress $\times$ $Flow_t^{Outsider}$ (β_3)	-0.188***	-0.187***	-0.318**	-0.331***
	(-4.55)	(-4.59)	(-2.36)	(-2.80)
$Flow_{t-1}^{Insider}$	0.193***	0.180***	0.0318	0.0027
	(4.86)	(4.69)	(0.25)	(0.02)
$Flow_{t-1}^{Outsider}$	0.0273***	0.0261***	0.0313	0.0298
	(2.97)	(2.94)	(1.08)	(1.08)
Cash share	-0.0138**	-0.0080	-0.0826***	-0.0772**
	(-2.40)	(-1.43)	(-2.78)	(-2.30)
Leverage	-0.196**	-0.203**	-0.269	-0.275
	(-2.55)	(-2.50)	(-1.27)	(-1.39)
Age in logs	-0.0037***	-0.0039***	-0.0061*	-0.0097***
	(-3.61)	(-3.43)	(-1.73)	(-3.01)
Fund size in logs	0.0013***	0.0013***	0.0048***	0.0051***
	(2.80)	(2.92)	(3.00)	(3.49)
Expense ratio	0.0134	-0.0006	0.436	0.872***
	(0.20)	(-0.01)	(1.64)	(3.72)
Family size in logs	0.0016***	0.0022	0.0073***	-0.349***
	(2.77)	(0.89)	(3.14)	(-3.35)
Past performance	0.0100***	0.0182***	-0.0525***	-0.0043
	(3.56)	(4.06)	(-3.68)	(-0.21)
Past volatility	-0.0609**	-0.0463*	-0.0659	-0.0652
	(-2.65)	(-2.00)	(-0.67)	(-0.73)
No of Obs	21,626	21,626	1,094	1,094
R-squared	0.0735	0.0869	0.2381	0.3307
Family FEs	No	Yes	No	Yes
Quarter FEs	No	Yes	No	Yes
Wald Test for $\cdots$				
$\cdots$ β_1+β_3=0 (*p*-value)	< 0.01	< 0.01	< 0.01	< 0.01

Table O.A.5: Bank Support via the Direct Flow Channel: Additional Checks

This table reports coefficient estimates from quarterly OLS regressions examining whether banks provide liquidity to affiliated mutual funds in distress. Columns (1)-(2) use fund style fixed effects (with and without style-by-quarter interactions). Columns (3)-(4) use Morningstar star-rating fixed effects (with and without star-rating-by-quarter interactions). Columns (5)-(6) extend the baseline specification by including a moderate distress in outsider flows and its interaction with distress. Controls include lagged insider and outsider flows, cash share, leverage, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and past volatility (12-month standard deviation of returns). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***.

	Dependent Variable: $Flow_t^{Insider}$					
	(1)	(2)	(3)	(4)	(5)	(6)
$Flow_t^{Outsider}$ (β_1)	0.00377	0.00111	-0.00635	-0.00710	0.00408	0.0148
	(0.22)	(0.06)	(-0.28)	(-0.32)	(0.21)	(0.86)
Distress (β_2)	-0.0146***	-0.0150***	-0.0134***	-0.0137***	-0.0147***	-0.0162***
	(-3.81)	(-3.91)	(-3.14)	(-3.20)	(-3.64)	(-3.85)
Distress $\times$ $Flow_t^{Outsider}$ (β_3)	-0.197***	-0.199***	-0.189***	-0.189***	-0.196***	-0.194***
	(-4.48)	(-4.46)	(-3.86)	(-3.87)	(-4.38)	(-4.59)
$Flow_{t-1}^{Insider}$	0.181***	0.179***	0.120***	0.120***	0.172***	0.176***
	(4.74)	(4.64)	(2.79)	(2.81)	(4.55)	(4.58)
$Flow_{t-1}^{Outsider}$	0.0288***	0.0288***	0.0282***	0.0282***	0.0288***	0.0238***
	(3.62)	(3.52)	(3.02)	(3.05)	(3.73)	(3.22)
Cash deposits share	-0.0182***	-0.0209***	-0.0145**	-0.0143**	-0.0127**	-0.0126*
	(-2.82)	(-3.13)	(-2.11)	(-2.03)	(-2.06)	(-2.00)
Leverage	-0.196***	-0.182**	-0.173**	-0.169**	-0.209***	-0.228**
	(-2.71)	(-2.34)	(-2.36)	(-2.30)	(-2.75)	(-2.63)
Age in logs	-0.00414***	-0.00413***	-0.00394***	-0.00394***	-0.00381***	-0.00373***
	(-4.24)	(-4.11)	(-3.09)	(-3.08)	(-3.60)	(-3.54)
Fund size in logs	0.00121**	0.00126**	0.000533	0.000550	0.00136***	0.00123***
	(2.56)	(2.66)	(1.12)	(1.16)	(2.94)	(2.69)
Expense ratio	0.00339	0.000457	0.00878	0.00855	0.0725	0.0798
	(0.06)	(0.01)	(0.12)	(0.11)	(1.07)	(1.17)
Family size in logs	0.00195***	0.00192***	0.00171***	0.00170***	0.000815	0.00701***
	(3.40)	(3.38)	(2.96)	(2.97)	(0.31)	(2.86)
Past performance	0.0162***	0.0211***	0.0104*	0.00955*	0.0139***	0.0117**
	(3.29)	(3.58)	(1.99)	(1.74)	(3.09)	(2.54)
Past vola	-0.00807	-0.00989	-0.00998	-0.00903	-0.0327	-0.0254
	(-0.32)	(-0.37)	(-0.35)	(-0.31)	(-1.48)	(-1.16)
$Mid\_Distress$					-0.00474***	-0.00455***
					(-3.75)	(-3.36)
$Mid\_Distress \times Flow_t^{Outsider}$					-0.143***	-0.128***
					(-3.83)	(-3.46)
Constant	-0.0454***	-0.0458***	-0.0288**	-0.0287**	-0.0232	-0.164***
	(-3.39)	(-3.43)	(-2.29)	(-2.28)	(-0.40)	(-2.83)
No of Obs	24,932	24,692	20,783	20,783	24,932	24,862
R-squared	0.0822	0.1110	0.0633	0.0738	0.0891	0.1669
Quarter FEs	Yes	No	Yes	No	Yes	No
Style FEs	Yes	No	No	No	No	No
Style-Quarter FEs	No	Yes	No	No	No	No
Star FEs	No	No	Yes	No	No	No
Star-Quarter FEs	No	No	No	Yes	No	No
Family FEs	No	No	No	No	Yes	No
Family-Quarter FEs	No	No	No	No	No	Yes

Table O.A.6: Interactions among Bank Support Mechanisms

This table reports coefficient estimates from OLS regressions that examine whether bank support via the direct flow channel varies across fund subsamples defined by combinations of within-family support, credit access, and cash holdings. The sample period is from Q1 2010 to Q2 2021. Panel A splits funds jointly by cash holdings and whether the family has a fund-of-funds (FoF) structure, where FoF serves as the proxy for within-family support. Panel B splits funds jointly by cash holdings and changes in credit lines: Low ΔCredit includes funds outside the top quartile, while High ΔCredit includes those in the top quartile. Panel C splits funds jointly by FoF structure and changes in credit. Low Cash refers to funds in the bottom three quartiles of the cross-sectional cash distribution in a given quarter, while High Cash refers to those in the top quartile. Distress is a dummy variable equal to one if a fund's outsider flows are in the bottom 10% of the sample distribution. Each regression is estimated separately for the subsample indicated. The control variables (omitted for brevity) include lagged insider and outsider flows, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and return volatility (12 months). All regressions include family and quarter fixed effects. Standard errors are clustered by fund and quarter. Statistical significance at the 10, 5, and 1 percent levels is indicated by *, **, and ***, respectively.

Panel A: Cash × ΔCredit

	Low Cash		High Cash	
	Low ΔCredit	*High* ΔCredit	*Low* ΔCredit	*High* ΔCredit
Distress $\times Flow_t^{Outsider}$	-0.255***	-0.230*	-0.048	-0.208**
	(-4.75)	(-1.96)	(-1.43)	(-2.13)
N	16,795	2,097	5,505	529
R^2	0.089	0.129	0.145	0.475

Panel B: Cash × FoF

	Low Cash		High Cash	
	FoF = No	*FoF = Yes*	*FoF = No*	*FoF = Yes*
Distress $\times Flow_t^{Outsider}$	-0.544**	-0.211***	-0.247	-0.054
	(-2.52)	(-3.50)	(-1.34)	(-1.34)
N	1,810	17,084	546	5,484
R^2	0.119	0.099	0.381	0.141

Panel C: FoF × ΔCredit

	FoF = No		FoF = Yes	
	Low ΔCredit	*High* ΔCredit	*Low* ΔCredit	*High* ΔCredit
Distress $\times Flow_t^{Outsider}$	-0.410**	-0.411***	-0.140***	-0.207**
	(-2.36)	(-4.38)	(-3.18)	(-2.11)
N	1,986	369	20,318	2,250
R^2	0.133	0.416	0.089	0.179

Table O.A.7: Robustness to Alternative Explanations: Contrarian Investing (Subsample of Mutual Funds)

This table reports coefficient estimates from quarterly OLS regressions examining whether banks' liquidity support differs between affiliated and unaffiliated funds. The sample period is from Q1 2010 to Q2 2021. To address concerns about investor awareness, the sample is restricted to mutual funds that were bought or sold by banks or their customers in the previous year. The dependent variable is a bank's normalized insider flows, defined as the quarterly change in the total value of a fund's holdings in the bank's aggregated portfolio. Affiliated is a dummy variable equal to one if a fund belongs to an investment firm affiliated with the bank. Each regression includes a three-way interaction between distress, affiliation, and outsider flows to capture whether affiliated distressed funds receive stronger support than unaffiliated distressed funds. Column (1) shows the baseline specification without controls or fixed effects, column (2) adds the full set of fund-level controls, column (3) includes bank and quarter fixed effects, and column (4) adds bank-by-quarter fixed effects. Controls include lagged insider and outsider flows, cash share, leverage, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and return volatility (12 months). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Dependent Variable: $Flow_t^{Insider}$			
	(1)	(2)	(3)	(4)
$Flow_t^{Outsider}$ (β_1)	0.0170***	0.0170***	0.0166***	0.0168***
	(6.35)	(5.94)	(5.98)	(6.18)
Distress (β_2)	0.0003	0.0002	0.0002	0.0002
	(0.47)	(0.31)	(0.38)	(0.38)
Distress x $Flow_t^{Outsider}$ (β_3)	0.0080	0.0062	0.0082	0.0066
	(1.11)	(0.84)	(1.27)	(0.95)
Affiliated	0.0016*	0.0017*	0.0000	0.0002
	(1.80)	(2.00)	(0.04)	(0.29)
Affiliated x $Flow_t^{Outsider}$ (β_4)	0.0117	0.0118	0.0141	0.0167
	(0.65)	(0.65)	(0.79)	(0.95)
Affiliated x Distress	-0.0133**	-0.0135**	-0.0125**	-0.0126**
	(-2.51)	(-2.55)	(-2.39)	(-2.64)
Affiliated x Distress x $Flow_t^{Outsider}$ (β_5)	-0.2228***	-0.2248***	-0.2269***	-0.2147***
	(-4.70)	(-4.73)	(-4.73)	(-4.71)
$Flow_{t-1}^{Bank}$		0.2067***	0.2011***	0.2047***
		(7.31)	(7.36)	(7.44)
$Flow_{t-1}^{Outsider}$		-0.0014	-0.0015	-0.0020
		(-0.96)	(-1.07)	(-1.47)
No of Obs	103,589	103,589	103,589	103,577
R-squared	0.0829	0.0857	0.0944	0.1195
Fund controls	Yes	Yes	Yes	Yes
Bank FEs	No	No	Yes	No
Quarter FEs	No	No	Yes	No
Bank x Quarter FEs	No	No	No	Yes
Wald Test for $\cdots$				
$\cdots$ β_1+β_3+β_4+β_5=0	<0.01	<0.01	<0.01	<0.01
$\cdots$ β_1+β_3=0	0.12	0.12	0.10	0.07

Table O.A.8: Bank Support via the Direct Flow Channel: The Role of Retail Deposits

This table examines whether banks provide stronger liquidity support to affiliated funds when they hold larger customer savings deposits (overnight and term deposits from households and firms, excluding monetary financial institutions). The table reports estimates for two subsamples: column (1) accounts for observations where the quarterly change in customer savings relative to affiliated fund family NAV is below the 75th percentile ($\Delta Cust.Savings$), and column (2) accounts for observations where the change is in the top quartile of the distribution. The variable *Affiliated* equals 1 when the majority of a mutual fund investment firm is owned by a universal bank. The dependent variable is normalized fund flows from a bank, measured as the quarterly total change in a fund's holdings within the bank's aggregated portfolio. The regressions include bank-by-quarter fixed effects. Controls include lagged insider and outsider flows, cash share, leverage, log age, log size, expense ratio, log family size, past performance (cumulative 12-month returns), and return volatility (12 months). Standard errors are clustered by fund and quarter. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and **, respectively.

	Dependent Variable: $Flow_t^{Insider}$	
	Low $\Delta Cust.Savings$	*High* $\Delta Cust.Savings$
$Flow_{t-1}^{Insider}$	0.12396***	0.18421***
	(4.8606)	(6.7301)
$Flow_{t-1}^{Outsider}$	-0.00185*	-0.00429***
	(-1.8876)	(-3.2151)
$Flow_t^{Outsider}$	0.02213***	0.02842***
	(8.7169)	(10.7831)
Distress	-0.00009	0.00012
	(-0.1518)	(0.2897)
Distress $\times$ $Flow_t^{Outsider}$	0.01269**	0.01051**
	(2.1819)	(2.2038)
Affiliated	0.00015	0.00076
	(0.1628)	(0.7320)
Affiliated $\times$ $Flow_t^{Outsider}$	-0.00907	0.02041
	(-0.4605)	(0.7681)
Distress $\times$ Affiliated	-0.00684	-0.01279*
	(-1.0116)	(-1.9333)
Distress $\times$ Affiliated $\times$ $Flow_t^{Outsider}$	-0.07929*	-0.29281***
	(-1.7073)	(-5.5348)
Cash deposits share	-0.00229	-0.00117
	(-1.5264)	(-0.8448)
Leverage	-0.00091	-0.04667***
	(-0.1058)	(-3.3552)
Age in logs	-0.00014	-0.00069***
	(-0.7728)	(-3.5708)
Fund size in logs	0.00032***	0.00024***
	(4.8559)	(3.3122)
Expense ratio	0.00625	0.00561
	(0.6277)	(0.6429)
Family size in logs	-0.00012*	0.00012*
	(-1.7340)	(1.6897)
Past performance	0.00078	0.00240***
	(0.9756)	(2.7547)
Past volatility	-0.00055	0.00772
	(-0.1001)	(1.5735)
No of Obs	81,143	132,952
R-squared	0.0574	0.1138
Bank $\times$ Quarter FE	Yes	Yes

Table O.A.9: Robustness to Alternative Explanations: Contrarian Investing (Client type)

This table reports coefficient estimates from OLS regressions on whether banks' liquidity support differs between affiliated and unaffiliated funds, partitioned by client type. The dependent variables are normalized fund flows from banks' retail (column 1) and institutional (column 2) client accounts, computed as the quarterly change in the total value of a fund's holdings in the bank's respective client portfolio. *Distress* is a dummy equal to one if a fund's outsider flows fall in the lowest decile. *Affiliated* is a dummy equal to one if a fund belongs to an investment firm affiliated with a bank. Each regression includes a three-way interaction term between distress, affiliated, and outsider flows to capture the incremental flows in affiliated distressed funds relative to unaffiliated distressed funds. Control variables include lagged flows from bank retail, bank institutional, and outside investors, cash share, leverage, fund age and size (log), expense ratio, family size (log), past performance (12m return), and past volatility (12m). Bank-by-quarter fixed effects are included. Standard errors are clustered by fund and quarter. Statistical significance at the 10, 5, and 1 percent levels is denoted by *, **, and ***, respectively.

Dependent variable:	$Flow_t^{Ret}$	$Flow_t^{Inst}$
$Flow_t^{Outsider}$ (β_1)	0.0056***	0.0139***
	(8.50)	(11.35)
Distress (β_2)	-0.0006***	-0.0001
	(-5.24)	(-0.27)
Distress $\times$ $Flow_t^{Outsider}$ (β_3)	-0.0034***	0.0074***
	(-3.64)	(3.15)
Affiliated	-0.0004	0.0008**
	(-1.09)	(2.19)
Affiliated $\times$ $Flow_t^{Outsider}$ (β_4)	0.0154***	-0.0092
	(3.36)	(-1.07)
Affiliated $\times$ Distress	-0.0014	-0.0026
	(-0.87)	(-0.90)
Affiliated $\times$ Distress $\times$ $Flow_t^{Outsider}$ (β_5)	-0.0506***	-0.0645***
	(-5.77)	(-3.24)
$Flow_{t-1}^{Ret}$	0.4376***	
	(13.48)	
$Flow_{t-1}^{Inst}$		0.0504***
		(3.28)
$Flow_{t-1}^{Outsider}$	-0.0014***	-0.0009
	(-3.99)	(-1.60)
Cash deposits share	-0.0001	-0.0010*
	(-0.38)	(-1.91)
Leverage	-0.0052**	-0.0090**
	(-2.24)	(-2.07)
Age (log)	-0.0002***	-0.0002**
	(-3.84)	(-2.63)
Fund size (log)	0.0001***	0.0001***
	(4.28)	(3.23)
Expense ratio	0.0013	-0.0011
	(0.66)	(-0.31)
Family size (log)	0.0000	-0.0000
	(0.15)	(-1.03)
Past performance (12m)	0.0011***	0.0003
	(4.27)	(0.80)
Past volatility (12m)	0.0004	0.0016
	(0.21)	(0.89)
No of Obs	214,095	214,095
R-squared	0.2646	0.0414
Bank-Time FEs	Yes	Yes
Wald test: $\beta_1 + \beta_3 + \beta_4 + \beta_5 = 0$	<0.01	0.01
Wald test: $\beta_1 + \beta_4 = 0$	<0.01	>0.1

Table O.A.10: Benefits to Funds: Performance Analysis with IV

This table reports OLS regressions testing whether the support via direct flow channel impact the fund performance during distress. The dependent variable is the fund alpha computed based on one- or six-factor models.Columns (1) and (2) test the relation between fund performance and the bank support ($I\{Flow_t^{Insider} > 0\}$), which is an indicator equal to 1 if affiliated bank flows are positive in quarter t.Columns (3) and (4) use changes in parent-bank customer savings scaled by bank total assets (Δ Cust. Savings) as an instrument for the bank support ($I\{Flow_t^{Insider} > 0\}$). Control variables include cash share, leverage, log age, log fund size, expense ratio, log family size, past performance, and past return volatility. All regressions include family and quarter fixed effects. Standard errors are clustered by fund and quarter. Significance at the 10, 5, and 1 percent levels is denoted by *, **, and *** respectively

	FF1 Alpha	FF6 Alpha	FF1 Alpha	FF6 Alpha
$I\{Flow_t^{Insider} > 0\}$	0.000196	0.000272*		
	(1.36)	(1.84)		
Distress	-0.000447**	-0.000478**	-0.000285*	-0.000360*
	(-2.68)	(-2.26)	(-1.78)	(-1.72)
Distress $\times$ $I\{Flow_t^{Insider} > 0\}$	0.000795***	0.000618**		
	(3.24)	(2.02)		
Δ Cust. Savings			0.0143	0.00166
			(1.34)	(0.11)
Distress $\times$ Δ Cust. Savings			0.0251***	0.0222**
			(3.21)	(2.02)
Cash deposits share	0.000301	0.000244	0.000260	0.000189
	(0.42)	(0.25)	(0.38)	(0.19)
Leverage	0.00346	0.000640	0.00338	0.000312
	(1.28)	(0.22)	(1.38)	(0.11)
Age in logs	-0.0000866	-0.000249	-0.000132	-0.000287
	(-0.51)	(-1.13)	(-0.78)	(-1.25)
Fund size in logs	0.000167***	0.000103*	0.000190***	0.000112*
	(3.38)	(1.93)	(3.63)	(1.83)
Expense ratio	-0.0142	-0.0419***	-0.0169	-0.0461***
	(-1.11)	(-2.70)	(-1.33)	(-2.85)
Family size in logs	0.000258	0.0000265	0.000193	0.0000284
	(1.49)	(0.13)	(1.23)	(0.13)
Past performance	0.0282***	0.0212***	0.0295***	0.0222***
	(9.79)	(5.59)	(10.00)	(5.01)
Past volatility	-0.0424***	-0.0471**	-0.0372***	-0.0444*
	(-3.18)	(-2.26)	(-2.84)	(-1.98)
No of Obs	24561	24561	22671	22671
R-squared	0.4861	0.3217	0.4975	0.3246
Family FEs	Yes	Yes	Yes	Yes
Quarter FEs	Yes	Yes	Yes	Yes

Table O.A.11: Benefits to Funds: Flow Analysis with IV

This table reports OLS regressions testing whether changes in parent-bank customer savings scaled by bank total assets (Δ Cust. Savings) reduce the persistence of outsider outflows. In column (1), the dependent variable is outsider flows in the following quarter $t+1$. In column (2), the dependent variable is outsider flows in quarter $t+2$, and in column (3) it is cumulative outsider flows over two quarters. $Flow_t^{Outsider}$ is lagged outsider flow. $I\{Flow_t^{Insider} > 0\}$ is an indicator equal to 1 if affiliated bank flows are positive in quarter t. Control variables include cash share, leverage, log age, log fund size, expense ratio, log family size, past performance, and past return volatility. All regressions include family and quarter fixed effects. Standard errors are clustered by fund and quarter. Significance at the 10, 5, and 1 percent levels is denoted by *, **, and ***

Dependent variable:	$Flow_{t+1}^{Outsider}$	$Flow_{t+2}^{Outsider}$	$CumFlow_{t+1,t+2}^{Outsider}$
	(1)	(2)	(3)
$Flow_t^{Outsider}$	0.190***	0.113***	0.333***
	(6.17)	(5.12)	(6.39)
Δ Cust. Savings	-0.253	-0.449	-0.935
	(-0.53)	(-1.18)	(-0.99)
Distress	-0.0104*	-0.0152**	-0.0252**
	(-1.77)	(-2.67)	(-2.39)
Distress × Δ Cust. Savings	1.369***	2.069***	3.775***
	(2.84)	(5.87)	(4.28)
Cash deposits share	-0.0136	-0.0368**	-0.0494*
	(-1.01)	(-2.41)	(-1.88)
Leverage	0.0315	0.103	0.151
	(0.36)	(1.22)	(1.04)
Age in logs	-0.00932***	-0.00662***	-0.0178***
	(-6.07)	(-5.17)	(-5.99)
Fund size in logs	0.00270***	0.00171**	0.00401***
	(3.75)	(2.61)	(2.92)
Expense ratio	-0.120	-0.187	-0.298
	(-0.74)	(-1.28)	(-0.96)
Family size in logs	-0.000742	0.000133	-0.000893
	(-0.14)	(0.03)	(-0.10)
Past performance	0.0787***	0.0553***	0.153***
	(5.40)	(5.40)	(6.45)
Past volatility	-0.0281	-0.00357	-0.0518
	(-0.46)	(-0.07)	(-0.43)
$Flow_{t+1}^{Outsider}$		0.181***	
		(7.24)	
No. of Obs.	22,790	22,522	22,522
R-squared	0.0625	0.0788	0.0907
Family FEs	Yes	Yes	Yes
Quarter FEs	Yes	Yes	Yes
Wald Test for ⋯			
⋯ β_1+β_3=0 (*p*-value)	<0.01	<0.01	<0.01

Figure O.A.1: Kernel Density of Selected Variables for Funds in the Switcher vs. Control Groups

This figure plots kernel density estimates of selected fund-level variables for switcher funds (dotted line) and control funds (solid line) prior to acquisition by a bank. Switcher funds are those that change their affiliation status during the sample period, excluding funds that are always affiliated or unaffiliated. The control group consists of funds that remain unaffiliated with a parent bank throughout the sample period.

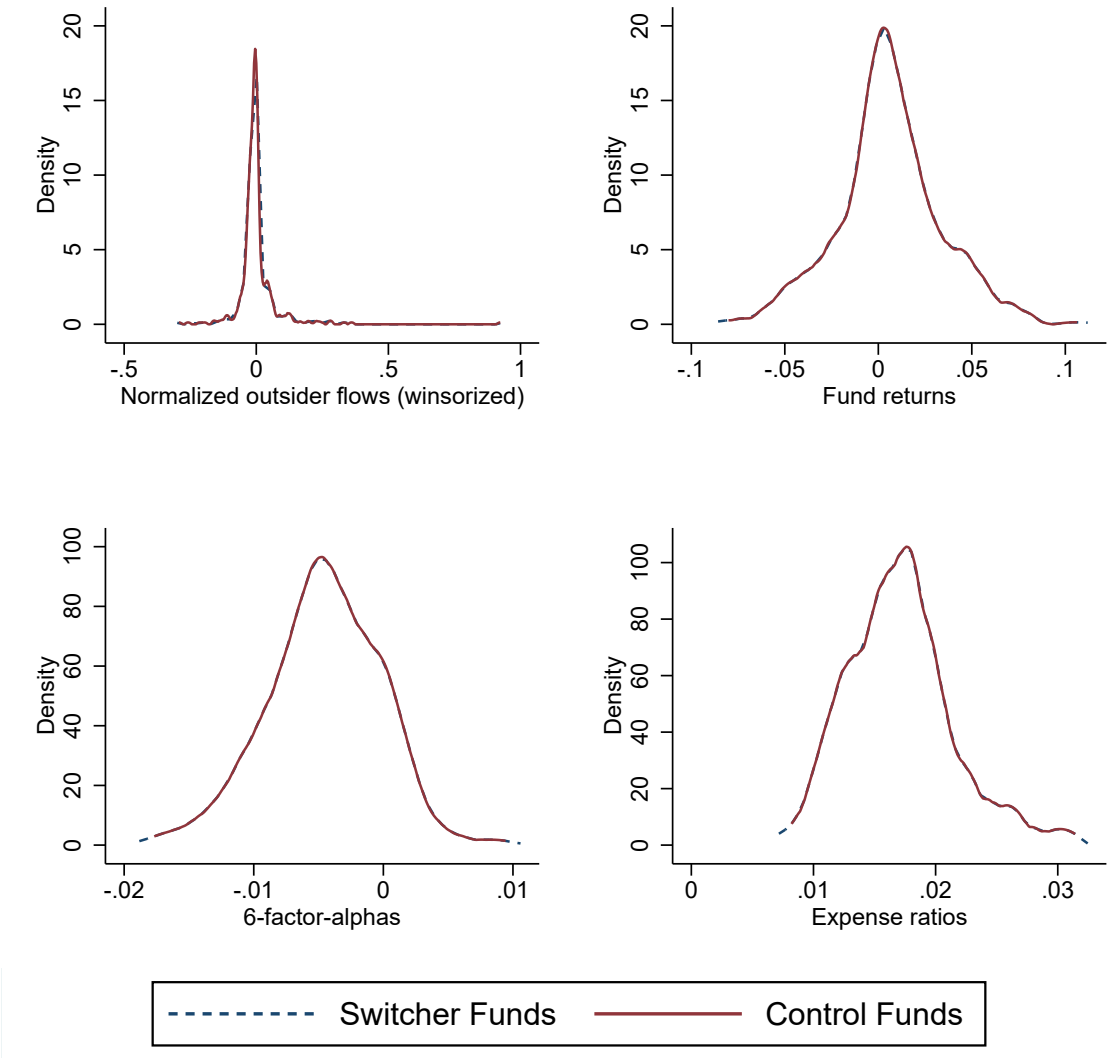

Figure O.A.2: Insider Flows Versus Outsider Flows: Including Fixed-income Funds

This figure plots the average insider flows into their affiliated mutual funds across deciles of percentage outsider flows, similar to figure 1. Each quarter, we sort all *equity, allocation, and bond funds* into deciles according to their outsider flows, with decile 10 containing the largest outsider flows. We then compute the cross-sectional averages of insider flows in each decile. Outsider flows are computed as the difference between an affiliated fund's total net flows and its insider flows. Insider flows are calculated as the quarterly total change in the value of an affiliated fund's holdings in the bank's combined proprietary and client portfolios.