Liquidity support and distress resilience in bank-affiliated mutual funds

Giulio Bagattini[⋆], Falko Fecht[⋆], and Angela Maddaloni[†]

[⋆]Frankfurt School of Finance and Management
[†]European Central Bank, DG Research

June 2020

Abstract

We study whether the stability of mutual funds and the propensity of a run among investors depend on the ownership structure of fund management companies. Analyzing a large portion of the European open-ended mutual fund industry, we find that flows of funds run by banks or by firms that belong to the same financial group as a bank are less volatile and less sensitive to bad past performance. This enables bank-affiliated funds to better weather distress and to hold lower precautionary cash buffers in comparison with their unaffiliated peers. We explain this finding by showing that banks provide liquidity support to distressed affiliated funds increasing their stakes in those funds that are experiencing large outflows. This in turn diminishes the severity of strategic complementarities in investors' redemptions. We find that liquidity support and other benefits of bank affiliation are particularly strong if the parent bank is more liquid and better capitalised. Analyzing the aftermath of two exogenous shocks to financial markets – linked to the Brexit referendum and to political uncertainty in the aftermath of 2018 political elections in Italy – we also gather evidence that distress in the banking system spills over to the mutual fund sector via ownership links. Our research highlights substantial dependencies between the banking system and the asset management industry and identifies an important channel via which financial stability risks depend on the organizational structure of the financial sector.

JEL codes: G2; G23; G3

1 Introduction

Concerns about potential financial stability risks posed by the asset management industry have increased recently as a result of the sector's growth. Mutual funds provide liquidity transformation to investors by issuing liquid liabilities (fund shares) and investing in potentially illiquid assets. The liquidity mismatch in funds' balance sheet may have far-reaching adverse consequences on investors' incentive to liquidate their shares during market unease

The views expressed herein are those of the authors only and do not represent the position of the European Central Bank or the Eurosystem.

even if investors are long-term, buy-and-hold agents because it creates a first-mover advantage in redemption decisions. While investors have the right to request the liquidation of their shares daily at the fund's Net Asset Value (NAV), the transaction costs imposed by share redemptions are left with the fund and reflected in the NAV following the sale of its assets. As a result, the liquidation costs originated by redeeming investors are born by the remaining investors in the fund. These dynamics may amplify outflows following bad fund performance and generate risks of a run, as investors have an incentive to exit faster if they believe that others will do so. The resulting price dynamics can spread to other parts of the financial system with a potential for fire-sale contagion.

While the severity of the liquidity mismatch exacerbates strategic complementarities in investors' redemptions, making illiquid funds particularly vulnerable as it increases the likelihood that financial distress precipitates a run, the first-mover advantage is attenuated if the fund is partly owned by large investors which are more likely to internalize the negative externalities generated by their redemptions. Chen et al. (2010) find that while retail illiquid funds suffer particularly large outflows following bad past performance compared to more liquid funds, investors' sensitivity to bad past performance is independent of liquidity if the fund ownership is mostly composed of institutional investors.

A similar mechanism may be in play when there is an external investor which commits to "bail out" the fund in the event of distress. This may be the case if the fund management company is part of a corporate structure that acts as an investor of last resort by providing emergency liquidity support in times of distress. For instance, Franzoni and Giannetti (2019) show that financial conglomerate-affiliated hedge funds perform better than independent hedge funds in times of distress and experience less outflows when they underperform. Kacperczyk and Schnabl (2013) find that money market funds' sponsors care about reputational spillovers generated by an individual fund's default to the financial conglomerate's other business.

In this respect, the case of bank holding companies is particularly relevant. Banks worldwide are major owners of asset management companies, and the overall implications of this arrangement are unclear. On the one hand, the interrelationship between banks and asset management firms within multi-unit bank holding companies gives rise to potential conflicts of interest. While fund managers should act in the best interest of fund investors, in practice they may have incentives to act on behalf of the parent firm's management and shareholders. On the other hand, bank affiliation may also have desirable effects from a financial stability point of view: bank holding companies can optimally use their different entities to achieve a mutual liquidity insurance and smooth out shocks. Fund management arms in particular might benefit from the parent bank support because banks fund themselves via different channels and sometimes are exposed to different financial shocks than investment funds. Bank-affiliated funds may also benefit from the parent bank's access to the central bank's liquidity provision operations. This suggests that funds that are run by asset management divisions of banking groups, or by asset management companies that belong to a financial group which includes a commercial banking business, might be able to mitigate strategic complementarities in investors' redemptions and be more resilient to financial distress thanks to the liquidity insurance provided by the parent institution.

In this paper, we test this hypothesis using data on over 30 thousand European investment funds' portfolio composition, performance and flows provided by Lipper. First, we find that flows of funds run by banks or by firms that belong to the same financial group as a bank are less volatile and less sensitive to bad past performance. We gather evidence that this enables bank-affiliated funds to better weather distress and to hold lower precautionary cash buffers in comparison with their unaffiliated peers.

As a second step, we show that banks concretely provide liquidity insurance to distressed affiliated funds. Using a unique dataset from the European Central Bank that contains security-level data on the 26 largest European banking groups' proprietary holdings of investment fund shares for the period 2013Q4–2018Q4, we provide evidence that banks increase their stakes in those affiliated funds that are experiencing large outflows, while this does not happen when a bank holds shares of a fund that does not belong to the bank's financial conglomerate. This in turn diminishes the severity of strategic complementarities in investors' redemptions, with beneficial effects on the stability of the funds. Furthermore, we find that liquidity support and other benefits stemming from bank affiliation, such as lower precautionary cash buffers, are particularly marked if the parent bank is more liquid and better capitalised.

To further investigate the implications of bank affiliation, we analyze the aftermath of two exogenous shocks to specific segments of the financial markets: the outcome of the Brexit referendum in June 2016 and unexpected distress in the market for Italian sovereign bonds in May 2018 caused by political uncertainty following national elections in Italy. Looking at both events, we find confirmation that, among funds highly exposed respectively to UK financial securities and to Italian government bonds, bank-affiliated funds are insulated from investor withdrawals provided that the parent bank is not exposed to the shock and that it is financially solid. Conversely, we also gather evidence that an increase in bank risk as a result of the exposure to Brexit and to the Italian sovereign is linked to outflows from funds affiliated to the distressed institution even when they do not hold a direct portfolio exposure to the affected assets. This highlights a novel channel of financial contagion and suggests that distress in the banking system spills over to the mutual fund sector via investor expectations on the basis of ownership links.

Our findings give an important contribution to the literature that explores the interrelationships between the different business units of a financial conglomerate and how they affect financial stability. On one hand, they uncover dynamics through which a particular ownership structure of asset management companies can improve the resilience of investment funds and the overall stability of the financial system. On the other hand, they also highlight substantial dependencies between the banking sector and the asset management industry, identifying an important channel of financial contagion via which distress can spread between different segments of the financial system.

The rest of the paper is organised as follows. Section 2 contains a review of the literature. Section 3 describes the data and the two main samples used for the empirical analysis. Section 4 further details the institutional setting and develops the main hypotheses. In section 5 we lay out the methodology and discuss the results. Section 6 concludes.

2 Related literature

Our paper is related to various strands of the literature. First, it speaks to the research on strategic complementarities in fund investors' behaviour and the possibility of fund runs.

Second, our paper contributes to an emerging literature that investigates how financial institutions direct investment from healthy business units to business units in financial distress. Our assessment of the stability of fund flows shares some similarities with the findings in Franzoni and Giannetti (2019). They show that, while financial-conglomerate-affiliated hedge funds perform worse than other hedge funds on average, they also have a lower flow-performance sensitivity, and this difference is particularly pronounced during financial turmoil. Our paper builds on similar findings, but adds novel evidence under several dimensions. Differently from Franzoni and Giannetti (2019), we also concretely identify a channel via which bank affiliation makes funds more stable, namely banks' direct intervention to purchase shares of distressed funds. In this respect, Fecht et al. (2018) also find direct evidence of liquidity support from banks to mutual funds. They show that banks use their distribution network to generate liquidity inflows from their clients into affiliated funds that otherwise experience excessive outflows. However, we go further and analyse how the reliance of funds on a safety net within the conglomerate may lead to financial contagion from the parent bank as bank distress spills over to the conglomerate's asset management arm, which is new to the literature.

Other studies find evidence supporting the view that funds derive benefits from their affiliation to a financial conglomerate. Fecht and Wedow (2014) give evidence that banks also provide liquidity support for their troubled open-end real estate funds that are under outflows pressure. Kacperczyk and Schnabl (2013) show that money market funds that were part of a financial conglomerate were more likely to receive direct support from their sponsors in the week after Lehman's bankruptcy.

Our paper is also closely related to other recent studies that investigate conflicts of interest in asset management firms that are part of a financial conglomerate and an opportunistic behavior of multi-unit bank holding companies which could damage affiliated investment funds. Funds could act as funding vehicles for their parent banks: Golez and Marin (2015) provide evidence that Spanish funds support the stock price of the parent bank, in particular after bad news and around seasoned equity offerings. Gil-Bazo et al. (2019) find that the same funds provide funding support to their parent company via purchases of bonds in the primary market, especially in times of financial stress and to riskier banks with limited access to funding. Additionally, affiliated funds could be used to redistribute risk from the parent bank to unleveraged investors: Bagattini et al. (2018) document that German banks benefited from the support of their mutual funds by shifting risky euro-area sovereign bonds from their portfolio during the sovereign debt crisis. In light of our findings, we argue that these results do not necessarily imply that banks abuse their mutual funds. In fact, most of the findings in this literature are consistent with bank holding companies using the different entities to achieve a mutual liquidity insurance, which could have desirable effects from a financial stability point of view.

Fund managers have also been found to support the bank's lending business by steering their investment policy towards stocks of the bank's clients (Ferreira et al. (2018)) and by overpaying for bank-underwritten IPOs (Ber et al. (2001)), at the expense of the investors in the fund. In contrast, some authors show other examples of how close ties between asset managers and financial institutions can be beneficial to fund investors. Massa and Rehman (2008) offer evidence that bank-affiliated mutual funds benefit of private information obtained by the controlling bank in its lending business with the respective firm. Mola and Guidolin (2009) find that affiliated analysts are likely to assign favorable ratings to stocks that are included in the portfolios of affiliated mutual funds.

Finally, several papers study how liquidity insurance within asset management firms and the optimization of performance at the firm level can generate distortions in delegated asset management and lead to redistribution of wealth across mutual fund investors. Gaspar et al. (2006) and Eisele et al. (2020) show that mutual fund families strategically reallocate performance among sibling funds in order to increase overall family profits. Bhattacharya et al. (2013) find evidence for liquidity insurance within mutual fund families which appears to benefit both the investment firm and the investors of funds suffering liquidity withdrawals, at the expense of the shareholders of the liquidity-supplying funds.

3 Data and sample construction

For our empirical analysis, we obtain two key data sets: the first is from the European Central Bank's securities holdings statistics by banking group (SHSG) and reports the proprietary security holdings of the 26 biggest banking groups operating in the euro area. The second data set comprises balance sheet and securities holdings information for open-end mutual funds domiciled in the European Union from Refinitiv's Lipper for Investment Management.

The *first sample* we construct focuses on banks' holdings of mutual funds' shares. The data set for the securities holdings statistics lists the quarterly holdings of banks on a security-by-security basis for the time period 2013Q4 to 2018Q4. For our analysis, we filter for all instruments that are classified as investment fund shares (instrument ESA classification F511), which include mutual funds, ETFs and (in minor part) other fund types, such as private equity funds and hedge funds. As our analysis focuses on mutual funds, we use the ECB's investment fund statistics and Lipper to identify the fund type and keep only mutual funds, while dropping ETFs and other fund types. Then, we use a hand-collected matching list to match banks to their affiliated asset management companies, i.e. to asset management companies which are fully owned or majority-owned by the parent bank, and ultimately to the asset management companies' mutual funds. In doing so, we take into account changes in the ownership structure of asset management companies that occurred during the sample period.

In total, the 26 banks hold 13,835 different mutual fund share classes (identified by their ISIN code) over the sample period. While for 3 banks none of these funds are affiliated to them, affiliated funds represent the majority of the other banks' fund portfolios. Figure 1 shows that, in aggregate, the market value of shares of affiliated funds held by the parent banks make up between 40% and 67% of the market value of mutual fund shares in the portfolio of the 26 banking groups.

We match the bank holdings on a security-quarter basis with fund data from Lipper such as size, flows, performance and cash holdings. We find that over 88% of the funds are covered in Lipper, although additional reporting gaps occasionally occur for single attributes.

We are interested in identifying fund flows (share redemptions and purchases) generated by banks in our sample, and distinguishing them from flows ascribable to all other investors. First of all, net flows at the fund share class level over a quarter are provided by Lipper on the basis of the following formula, which uses the evolution of a fund's total net assets (TNA) while netting out the assets' return:

$$\text{Net flows}_{jt} = \text{TNA}_{jt} - \text{TNA}_{jt-1} \times R_{jt} \tag{1}$$

where j denotes the fund share, t denotes the quarter, and R_{jt} is the gross return of the fund's portfolio in period t. Typically, share withdrawals and purchases across different share classes of the same fund are pooled together and netted, after which the necessary amount of securities is purchased or sold by the manager in order to meet investor flows. As a consequence, our variable of interest is flows at the fund level. We calculate this quantity via the following formula:

$$\text{Fund flows}_{kt} = \left(\sum_{j=1}^{J_k} \text{Net flows}_{jt} \Big/ \sum_{j=1}^{J_k} \text{TNA}_{jt-1} \right) \times 100, \tag{2}$$

where we sum the total net flows over all share classes $j \in \{1, \dots, J_k\}$ belonging to fund k, and we scale the total net flows by the fund's aggregate assets over all share classes. [1]

To construct fund flows generated by a single investor (in this case, a bank), we calculate the implied return R_{jt} of equation (1) from the flows and size provided by Lipper, and we use it to account for quarter-on-quarter changes in the market value of the fund shares held by the bank which are not due to share redemptions or investment:

$$\text{Bank flows}_{ijt} = \left(\frac{\text{Market Value Held}_{ijt} - \text{Market Value Held}_{ijt-1} \times R_{jt}}{\sum_{j=1}^{J_k} \text{TNA}_{jt-1}} \right) \times 100 \tag{3}$$

where i denotes the bank. In this way, we obtain a quantity with the same unit of measure as the fund flows computed in (2), with the difference that the net flows in formula (3) are those generated by a single investor (bank i) by trading in a single share class j.[2]

Finally, we aggregate all flows generated by the banks in our sample at the fund level to obtain our last key variable, i.e. fund flows generated by outside investors:

$$\text{Non-bank flows}_{kt} = \text{Fund flows}_{kt} - \sum_{i=1}^{26} \sum_{j=1}^{J_k} \text{Bank flows}_{ijt}. \tag{4}$$

Computing the flows from outside investors by deducting the flows from each bank $i \in \{1, \dots, 26\}$ from the total flows allows us to obtain a variable at the fund k and quarter t

[1] After this step, we drop any observation where the resulting percent flow is greater than 200% or less than −60%. Flows of that size are rare and are typically related to structural changes in the fund, e.g. mergers (cf. Coval and Stafford (2007)).

[2] To temper the effect of outliers, of micro-funds and of possible inconsistencies between the market values provided by Lipper and those reported in the SHSG, we execute a number of data cleaning steps: we set the bank flows to missing whenever these are greater than 90% or lower than -90%; when the implied return R_{jt} is greater than 1.3 or lower than 0.7; when the market value held by a bank exceeds the aggregate fund value by more than 1%; and when the aggregate fund value is lower than €2 million.

level, independent of bank i. Exogeneity with respect to the sample of bank holdings is key to identifying the effect of *Non-bank flows*$_{kt}$ on the investment decisions of different banks.

Panel A of Table 2 presents summary statistics for this sample. The contribution to fund flows stemming from banks' trades is null in approximately half of the observations, reflecting periods when banks simply hold the fund shares. However, in more than 4% of the overall observations, banks execute sizeable trades which generate flows amounting to over 1% of the fund's total assets under management. The mutual funds in banks' portfolios that are affiliated to the holding bank make up 20% of the observations. Given that according to Figure 1, conversely, affiliated funds outweigh other funds in market value terms, this implies that bank holdings of affiliated funds tend to be larger. On average, across the sample banks hold 2.49% of a mutual fund's value.

The *second sample* focuses on mutual funds domiciled in the European Union and it is drawn from Lipper at a monthly frequency, subsequently aggregating different share classes into a single fund. We download time-invariant fund attributes – such as asset type, investment style, client type (institutional or retail), management company – as well as time-varying characteristics such as portfolio allocations, size, performance, and flows at a monthly frequency.

Lipper also lists the ultimate parent of a fund's management company. However, this attribute is static and isn't always accurate. Therefore, we manually validate the information given by Lipper and research possible changes in ownership during the sample period in holding companies' accounts, management companies' websites and financial news outlets. To be able to do this, we limit our search to those parent companies (as initially provided by Lipper) which, for at least one month, are either associated to at least 20 mutual funds or whose funds' TNA exceeds €5 billion.

The resulting sample covers 85% of the mutual funds registered in Lipper, and 95% of their TNA. We drop closed-end mutual funds, funds that track an index and private funds, as well as real estate and commodities funds, and we are left with 30,394 primary mutual funds. Of these, we exclude from our analysis 2,081 small funds with TNA under €5 million. Our final sample is composed of 36% equity funds, while 30% are classified as mixed-assets, and bond funds make up 25% of the observations. 5% are alternative assets funds and 4% money market funds.

Figure 2 shows that affiliated funds make up the better part of the open-end mutual funds industry in Europe. They represent between 58% and 66% of the total and hold over half of the aggregate TNA. Our sample contains funds domiciled in 26 countries (all the EU28 countries with the exception of Croatia and Romania). Overall, more than one third of the funds are domiciled in Luxembourg, 14% are domiciled in France, followed by Ireland, Great Britain, Spain, Belgium and Germany. Figure 3 shows that, also in terms of assets under management, Luxembourg is home to the largest share of both affiliated and unaffiliated funds. As Luxembourg-domiciled funds are mostly owned by foreign asset management companies or by Luxembourgian subsidiaries created ad-hoc, the picture changes when we look at the nationality of the funds' ultimate parents. As it emerges from Figure 4, the United States are among the most important countries which host banks and other financial corporations owning European mutual funds. In terms of banking conglomerates, the relative majority of funds by TNA is ultimately ascribable to French holding companies. Among non-EU countries, also Switzerland plays an important role, being host of a number of universal banks as well as banks focusing on private wealth management which lead sizeable asset management businesses.

In this sample, we do not have securities holdings information for all the parent banks. Therefore, instead of looking for direct evidence of liquidity support to affiliated mutual funds, we study the effect of bank affiliation on the overall behavior of fund investors, which is reflected in fund flows and in funds' management of cash buffers. On top of focusing on the distinction between bank-affiliated funds and funds belonging to independent asset management companies or to non-bank financial conglomerates, for those funds that are affiliated to a bank, we also examine the influence of the parent bank's financial health and portfolio composition. To this end, we merge a subsample of the bank-affiliated funds with key items from their ultimate parent's balance sheet, drawn from the COREP and FINREP datasets of euro area significant institutions (SIs) and less significant institutions (LSIs). In particular, our analysis uses banks' capital and liquidity ratios and their on-balance-sheet exposure to specific countries in percentage of total assets. We are able to match between 38% (liquidity coverage ratio) and 60% (capital ratio) of the observations in our sample of affiliated funds.[3] Finally, we also retrieve CDS spreads from Refinitiv's Eikon for all banks in our sample, whenever these are available, matching 55% of bank-affiliated funds.[4]

The raw data at the share class level also contain an indicator for whether the fund is open to retail investors or dedicated to institutional investors, with the latter being the case in approximately one fourth of the observations. In our data at the fund level, we collapse this variable into a value-weighted average, representing the fraction of fund assets that are owned by institutional investors.

Panel B of Table 2 presents summary statistics for this sample, broken down into affiliated and non-affiliated funds in order to facilitate a comparison between the two groups. Affiliated funds are smaller (average TNA of €71 million versus €90 million) and cater to a lower proportion of institutional investors (on average 14% of TNA versus 21%). Affiliated funds tend to have slightly lower fees, but they also appear to underperform compared to unaffiliated funds both in terms of raw returns and in terms of risk-adjusted returns (Jensen's alpha). However, as both return measures also display a lower standard deviation in affiliated funds, their underperformance might be due to unaffiliated funds being more risky as well as differentiating their investment strategy to a higher extent from the provided benchmark.

Our two samples allow us to conduct two sets of distinct but complementary analyses. With the bank holdings sample we gather direct evidence of one of the mechanisms that banks use to provide a liquidity backstop to affiliated funds for a subset of the largest institutions (which nevertheless represent a large share of the banking and asset management businesses in Europe). The monthly sample, thanks to the larger fund cross-section, allows us to study how the mechanisms identified in the first sample translate into widespread peculiarities of fund flow dynamics and liquidity management in affiliated funds as opposed to their unaffiliated peers.

---

[3] As these indicators are relatively stable over time and given that we use them in levels, in the main analysis we cover reporting gaps up to four quarters by linear interpolation. The interpolated data for capital are 13% of the final sample, for liquidity 34%, for country exposure 20%.

[4] We use CDS with a 5-year tenor, as these are usually the most liquid contracts.

4 Institutional background and hypotheses

Easy redemption options in mutual funds can create run risks because investors have an incentive to exit faster than the others given that the liquidation value of fund shares declines the longer investors wait to exit. This decline in value happens because asset managers may deal with large redemptions by using cash buffers and by selling relatively more liquid assets first. Additionally, if the costs of selling assets is passed on to the remaining investors, such effects are intensified for funds investing in relatively less liquid assets.

Parent banks can step in to provide liquidity to distressed funds, in the context of a mutual liquidity insurance scheme and because they would internalize part of the losses if they already hold a stake in the fund. An emergency intervention by the mother institution can prevent that the fund deplete its cash buffers, decrease the quality of its asset portfolio and incur liquidation costs, thereby contributing to attenuate strategic complementarities and defuse risks of an investor run on the fund.

Banks have substantially three ways to provide support to affiliated funds in periods of stress: they can do so by providing liquidity via lending, for example in the form of repurchase agreements; by buying illiquid securities that the fund manager intends to sell off; or by directly purchasing the fund's shares. In this paper we focus on the last contingency. In particular, we formulate the following hypothesis.

Hypothesis 1: *Banks tend to purchase shares of distressed affiliated funds that are experiencing excessive outflows.*

It is sensible to expect that not all banks can effectively put in place support mechanisms to prevent distress at their affiliated mutual funds. Firstly, not all banks might have the opportunity to enlarge their investment portfolio purchasing fund shares in response to unexpected liquidity shocks. Indeed, investing in mutual funds likely causes an increase in the bank's risk-weighted assets (unless it is matched by a correspondent divestment from similar assets), thereby driving down regulatory capital ratios and possibly forcing the bank to set aside more equity to prevent a capital shortfall. The appetite for banks to intervene on the mutual funds' market might also rest on their available liquidity. As it is easier for banks to purchase additional fund shares by using their available liquidity than by liquidating part of their securities portfolio, banks with a higher liquidity ratio might be more prone to step in in case of affiliated funds' liquidity crisis. This reasoning leads us to the following hypothesis:

Hypothesis 2: *The strength of banks' support to affiliated funds via share purchases in case of excessive outflows is positively correlated to their capital and liquidity ratios.*

Next, we exploit our second sample and analyze whether affiliated funds are more resilient to underperformance, as a result of fears of runs among investors failing to materialize thanks to the liquidity insurance function provided by the parent bank. If this is true, the sensitivity of flows to past bad performance should be attenuated, as investors' decisions will depend less on the expectations around their peers' actions. Our conjecture as to the role of bank affiliation is summarized in the following hypothesis.

Hypothesis 3: *All else equal, outflows are less sensitive to bad past performance at affiliated funds than at unaffiliated funds. In other words, following underperformance, investors at unaffiliated funds withdraw more than investors at comparable affiliated funds.*

Another indicator that a fund is more stable and less prone to cyclicality and shocks than its peers is the volatility of its flows. If the parent institution provides liquidity support to the fund in case of distress, we expect its flows to be less volatile for two reasons. First, if the parent bank carries out fund share purchases, it behaves as a contrarian investor and helps smoothing fund flows. Second, if investor expect that the fund can rely on a "free" liquidity insurance from an investor of last resort, then their reaction to other investors' non-informative withdrawals and other temporary market stimulus should be muted as it will not be driven by strategic complementarities in withdrawals. We therefore formulate the following hypothesis.

Hypothesis 4: *Flows of bank-affiliated funds are less volatile than flows of comparable funds that are not affiliated to a bank.*

Finally, we study the funds' holdings of cash and cash equivalents. In general, asset managers appear to actively manage their liquidity risks with precautionary cash buffers in view of possible idiosyncratic or systematic outflow pressures. IMF (2015) finds that funds hold higher cash buffers when they face more volatile flows from investors (in line with a precautionary motive) and when these investors are primarily less stable retail investors. However, holding cash is costly as fund managers forgo profitable investment opportunities. On the other hand, if funds can count on stable sources of liquidity, such as repos with an institution at favourable prices, then presumably they can set their precautionary cash buffer at a lower level. Following the above line of reasoning, we formulate the following hypothesis.

Hypothesis 5: *Other things equal, bank-affiliated funds hold a lower cash buffer than unaffiliated funds.*

So far, our hypotheses reflect the view that funds that belong to a financially solid banking conglomerate are perceived to be safer from investors, which in turn guarantees them a more stable investor base in general terms. However, the effects of this perceived stability in the event that distress materializes are a priori not clear, not least because it might give rise to adverse incentives in the fund management. For instance, the existence of a potential safety net within the financial conglomerate of bank-affiliated funds may lead managers at these funds to lower the cash buffer, leaving the funds more fragile in the event of abnormal withdrawals in case the parent institution is not actually willing or able to intervene. For this reason, next we study the impact of unexpected shocks which exogenously affect a specific segment of affiliated and unaffiliated funds. We conjecture that bank-affiliated funds would be more shielded from shocks which do not affect their parent bank, or which their parent bank is expected to withstand because of its financial solidity. As a consequence, under these conditions, affiliated funds are expected to be in a better position to withstand the negative shock.

Hypothesis 6: *In the aftermath of a common negative shock in financial markets to which they are exposed, funds affiliated to banks not exposed to the shock tend to experience less outflows than comparable unaffiliated funds. This is especially true if the parent bank is financially solid.*

The motivation for all the previous hypotheses lies in the view that the existence of a banking conglomerate exerts a positive influence on affiliated funds, ultimately because the potential liquidity support provided to the funds by the parent company changes investors' optimal behavior in equilibrium. However, the existence of this potent channel that works via investor expectations suggests that the same channel might also operate in reverse. Specifically, if the financial health of a bank suddenly worsens following a crisis, investors might decide to flee its affiliated funds because the shock that hit the bank means that the protection that it had been providing to its funds ceases to exist. Further, fund investors might fear that deteriorating financial conditions at the bank could draw resources from the other parts of the conglomerate, and possibly lead to defaults. For these reasons, we conjecture that distress in the banking arm spills over to the asset management arm, affecting funds that would otherwise be insulated from the shock.

Hypothesis 7: *In the aftermath of a financial shock affecting banks, a contagion effect from the banking side to the asset management side of financial conglomerates occurs, with the result that mutual funds with no direct portfolio exposure to crisis assets which are affiliated to exposed banks experience abnormal outflows.*

5 Results

5.1 Banks' liquidity support to funds via share purchases

We start by exploiting our sample of banks' securities holdings, and test whether banks put in place a backstop for affiliated funds that are experiencing outflows by purchasing the funds' shares, as conjectured in Hypotheses 1. We construct the fund flows (in other words, trades in fund shares) originating from banks and from all other investors respectively as in expression (3) and (4). The bank trade variable is computed at the fund share class (ISIN) level, in order to exploit the maximum degree of granularity provided by our dataset, and account for differences between share classes of the same fund that might affect bank behavior (for instance the fee structure and, ultimately, net performance). However, in (4) we construct overall fund flows by aggregating flows net of bank trades in all share classes. Coherently, bank trades are normalized with respect to the total fund size rather than the TNA of the single share class. The rationale for this is that, in mutual funds offering multiple share classes, the manager operates on a single portfolio of assets; share issuance and redemption from different share classes are pooled together, and the resulting outflows/inflows determine whether the fund manager has to liquidate or purchase assets. When a bank decides to increase its holdings in a mutual fund's shares in order to provide liquidity support, then, it is reasonable to hypothesize that it does so after observing the outflows at the aggregate fund level rather than at the single share class level. As a consequence, a measure of fund stress should be based on the aggregate flows across the fund's share classes.

Overall the banks in our sample might tend to purchase distressed funds because they are contrarian investors, or because they act as market makers. We can account for these effects via a panel fixed-effects specification that allows us to control for observed and unobserved time-varying heterogeneity both across banks and across funds using bank-quarter and fund-quarter fixed effects. To identify whether outflow pressure in affiliated funds leads the parent bank to provide liquidity by purchasing shares, we estimate the following regression model:

$$\begin{aligned} &\text{Bank flows}_{ijt} = \beta_1 \cdot \text{Non-bank flows}_{kt} \times \text{Affiliated}_{ikt} + \\ &+ \beta_2 \cdot \text{Non-bank flows}_{kt} \times \text{Is Outflow}_{kt} \times \text{Affiliated}_{ikt} + \gamma_{jt} + \alpha_{it}, \end{aligned} \tag{5}$$

with

$$\text{Affiliated}_{ikt} = \begin{cases} 1 & \text{if fund } k \text{ is affiliated to bank } i \text{ at date } t, \\ 0 & \text{otherwise.} \end{cases}$$

Is Outflow$_{kt}$ is a dummy that is equal to 1 if *Non-bank flows*$_{kt}$ is negative, and 0 otherwise, and γ_{jt} and α_{it} represent sets of dummies which account, respectively, for fund share-quarter fixed effects and bank-quarter fixed effects.

Table 3 shows the result of our analysis based on specification (5), which allows us to study the effect of fund inflows and outflows on banks' investment decisions. In columns (1) to (3), we run regression (5) with increasingly comprehensive sets of fixed effects. Columns (1) and (2) show that generally there is a slightly negative correlation between the investment decisions of the banks in our sample and the trades of the rest of the investors in the funds (-0.0145 and -0.0147). The correlation increases when non-banks are redeeming shares (additional coefficient of -0.0333 and -0.0326 when *Is Outflow* = 1). However, we find that banks' contrarian behavior is by far more marked for funds affiliated to the bank and particularly in the case that the fund is experiencing outflows: there is a strongly significant additional negative correlation (-0.134 and -0.130). Hence, banks seem to specifically react to outflows in affiliated funds by purchasing fund shares, thus decreasing the fund's net outflows. This result does not withstand time-varying fund fixed effects (column (3)), although it should be noted that with this restrictive specification the sample shrinks by 70%. The reason for this is that the overlap between banks' portfolios of mutual funds is limited, and it often occurs that a fund share is held by only one bank in our sample. Thus, most of the bank holdings do not contribute to the estimation when we control for fund-quarter fixed effects.

Next, we check the robustness of our results when we consider only bank trades where the bank held a non-zero amount both at the beginning and at the end of the period. This would exclude those observations where a bank were to fail reporting a share holding in a single period, thereby assuaging potential data quality concerns.[5] However, this restriction also disregards those instances where the bank creates a new holding genuinely for the specific purpose of supporting an affiliated fund, as opposed to cases in which the bank intervenes because inaction would lead it to internalize losses originating on an already existing position. Columns (4) and (5) show that the correlation indicating liquidity support from the bank is still strong and highly significant, although the coefficient halves in comparison to the full-

[5] Outlier trades – for instance observations where bank trades exceed 90% of the fund value – were already dropped from the baseline sample.

sample estimation (from -13% to -6%), notwithstanding that the sample size only shrinks by about 13%. The lower correlation suggests that banks do not primarily provide a backstop to funds they already own. Finally, we add time-varying fund "peer group" fixed effects to the estimation. These control for combinations of a fund's asset type, geographical focus and benchmark, and allow us to compare funds that are similar in terms of investment style and risk, at the same time without losing much of the sample as when imposing the stricter fund-specific time-varying fixed effects. Column (6) shows that, while the R-squared indeed climbs from 11% to 24%, the statistical significance of the previous result even increases.

Next, we investigate whether the parent bank's intervention on the market is stronger when affiliated funds are experiencing excessive outflows. We define

$$\text{Distress}_{kt} = \begin{cases} 1 & \text{if Non-bank flows}_{kt} < \mathcal{Q}(5\%) = -15.83\%, \\ 0 & \text{otherwise,} \end{cases}$$

where $\mathcal{Q}$ is the quantile function associated to the variable *Non-bank flows*. In other words, $\textit{Distress}_{kt}$ marks the 5%-tail of the distribution of flows where non-bank investors of fund k withdraw more than 15.83% of TNA during quarter t. We then condition on the sample where $\textit{Is Outflow}_{kt} = 1$, and estimate

$$\text{Bank flows}_{ijt} = \beta_1 \cdot \text{Affiliated}_{ikt} + \beta_2 \cdot \text{Distress}_{kt} \times \text{Affiliated}_{ikt} + \gamma_{jt} + \alpha_{it}. \qquad (6)$$

Testing specification (6) on the sample of fund outflows allows us to study whether banks' contrarian behavior when trading affiliated funds' shares, which emerged from regression (5), depends on the severity of fund outflows. Columns (1)-(3) of Table 4 report the results of the baseline regression with different sets of fixed effects. On average, if a fund is experiencing extreme outflows (*Distress* = 1, outflows larger than -15.83%), its parent bank is responsible for an inflow of 1.46%, even when we account for bank-time fixed effects. Again, the correlation in this baseline estimation does not hold when we include a set of dummies absorbing security-time averages, as the number of observations actively used to estimate the coefficients drops from 69,117 to 21,916.

Following Hypothesis 2, we next investigate which factors determine heterogeneity in banks' investment decisions. We augment regression (6) with cross-sectional bank characteristics that might further explain banks' propensity to provide liquidity support to affiliated funds. In columns (4) and (5) we introduce a dummy for whether the bank is respectively highly capitalised and highly liquid. In particular, the dummy for high capital (resp. liquidity) takes the value of 1 if the bank's CET1 ratio (resp. liquidity coverage ratio) at the end of the previous quarter is in the highest quartile of the sample, and 0 otherwise. These two variables have only a 30% correlation. Column (4) shows that, when we isolate the investment choices of highly capitalised banks, a strong contrarian trading reaction ($\beta = 0.725$, $p = 4.7\%$) persists in response to outflows in affiliated funds even in the most restrictive specification where we account for time-varying bank *and* security fixed effects. Column (5) suggests that also more liquid banks might be more prone to buy crisis funds, although the coefficient does not reach the conventional significance level ($\beta = 1.795$, $p = 14.7\%$).

Next, we again restrict the sample to trades in shares that the bank was holding both at the start and the end of a quarter. As columns (6) and (7) show, banks' reaction appears to be on average smaller in this case, although the estimation is more precise and conserves the same statistical significance as in the original tests. In columns (8) and (9) we test the most restrictive specification – including fund-quarter fixed effects – directly for highly capitalised and liquid banks. In both cases, again the estimated effect is smaller but still statistically significant, now also with respect to liquid banks.

Finally, as columns (6)-(9) suggest that those cases in which the bank invests in new funds seemed to be relevant in determining the average intensity of banks' emergency purchases, it is interesting to further study the role that the original bank's stake in the fund plays in determining its reaction to fund distress. Hence, we interact the size of the bank holding at the beginning of the period, expressed as a percent of the fund TNA, in the baseline regression with fund fixed effects, time-varying bank fixed effects and additionally time-varying fund group fixed effects. Column (10) shows that, when a fund happens to be in distress, a higher bank stake at the beginning of a quarter is positively related to an additional bank investment during that quarter corresponding to 14.5% of the original stake ($p<0.001$). However, for affiliated funds the additional effect of the holding size is nil (opposing coefficient of -13.1%): only the unconditional interaction *Distress* × *Affiliated* signals liquidity support. This result confirms that the propensity of parent banks to provide liquidity support does not increase if the bank already owns a stake in the fund or with the relative size of the holding. On the other hand, it also provides a novel insight: when banks hold a relevant stake in *any* distressed fund, they tend to act as contrarian investors. This behavior can be optimal to the extent that banks try to avoid taking losses incurred when selling the shares in a downturn.

To conclude, the analysis in this section suggests that banks tend to provide a liquidity backstop to affiliated funds that are subject to abnormal outflows, and this does not seem to be motivated by them owning large stakes before the fund becomes distressed. Focusing on that subsample for which we can compare the reaction of the parent bank to fund distress with the reaction of another bank in our sample at the same time, it emerges that if the parent bank is among the better capitalised or liquid banks, then significantly different behavior occurs whereby the parent bank acts in a contrarian manner as opposed to the other institution.

5.2 Flows and cash management in affiliated funds

In this section, we study the impact of bank affiliation on investor behavior. Our key dataset for the following analysis contains mutual funds domiciled in the European Union that are reported in Lipper.

One way in which investor behavior is reflected in observable characteristics is the sensitivity of fund flows to performance. Typically, investors evaluate mutual funds based on past performance and flock to those that outperformed their peers in relatively recent periods, while withdrawing their investment from those that performed poorly.

If parent banks act as stabilizers of their funds in bad times, attenuating strategic complementarities in redemptions, we expect the effect of bad performance on flows to be more moderate in affiliated funds, while we do not expect to find significant differences in how investors react to good performance. We test this conjecture via the following regression:

$$\begin{aligned}\text{Fund flows}_{jt} = &\beta_1 \cdot \text{Alpha}_{j,t-1} \times \mathbb{1}_{\text{Alpha}_{j,t-1}>0} + \beta_2 \cdot \text{Alpha}_{j,t-1} \times \mathbb{1}_{\text{Alpha}_{j,t-1}<0} \\ &+ \beta_3 \cdot \text{Alpha}_{j,t-1} \times \mathbb{1}_{\text{Alpha}_{j,t-1}>0} \times \text{Affiliated}_{jt} + \\ &\beta_4 \cdot \text{Alpha}_{j,t-1} \times \mathbb{1}_{\text{Alpha}_{j,t-1}<0} \times \text{Affiliated}_{jt} + Controls_{jt} + \gamma_{kt},\end{aligned} \tag{7}$$

where $Alpha_{j,t-1}$ is fund j's "alpha" over quarter $t-1$ calculated via a one-factor model that uses as a benchmark the fund's Lipper Global classification group, and γ_{kt} represents sets of dummies for each combination of month t and fund peer group k. Time-varying fund controls include a lag of fund flows, the logarithm of TNAs, the total expense ratio, the age of the fund, the proportion of institutional investors and its interaction with fund's performance.

In the above regression, positive β_1 and β_2 identify the typical flows-performance relation found in the asset management industry, as investor demand for a fund respectively increases following good performance and decreases following bad performance. On the other hand, β_3 and β_4 measure whether the sensitivity of flows to performance is different in bank-affiliated funds in comparison to non-bank-affiliated ones.

Table 5 presents the results. We start by including only time fixed effects in the estimation. Column (1) shows that, coherently with the literature on mutual fund flows, past performance, as measured by the fund's alpha over the previous six-month period, is a strong predictor of fund flows regardless of its sign. The coefficients for negative and positive performance sensitivity are also similar in magnitude: one standard deviation higher (resp. lower) alpha translates into approximately 0.4% higher (resp. lower) monthly fund flows. However, in the case of bank-affiliated funds, the sensitivity to negative performance is halved, while there is no significant difference in flows following outperformance. It is also interesting to note that, as the investor base tilts towards institutional investors, flows become substantially more sensitive to negative performance, while this is not the case for positive performance.

In column (2), we repeat the estimation including time-varying fund "peer group" fixed effects, thereby benchmarking the sensitivity of flows on a sample of funds that are similar in terms of asset composition and investment objective. According to this estimation, the sensitivity of flows to negative performance for non-affiliated funds is even more statistically significant and slightly larger in magnitude than previously. The offsetting coefficient for affiliated funds is slightly smaller in magnitude, which suggests that differences in investment style and objective can explain part of investors' behavior that was previously attributed to bank affiliation. Nonetheless, the effect of affiliation is still sizeable, strongly significant and reduces the baseline sensitivity by one third. On the other hand, as before, the sensitivity to positive performance is similar in affiliated and unaffiliated funds.

The results we found so far represent an average of investor behavior that can potentially differ a lot across different asset classes. For instance, Goldstein et al. (2017) document that outflows are more sensitive to underperformance of corporate bond funds than are inflows to outperformance, while this relation has been found to be frequently convex in equity funds. Following this insight, we re-run the regression separately for the two main fund types: in columns (3) and (4), we limit the sample respectively to equity and to bond funds.

First of all, the sample split reveals that the flows-to-performance sensitivity estimated for unaffiliated funds is considerably higher in bond funds than in equity funds (0.23 versus 0.16 for outflows). As bond funds are on average more illiquid than their counterparts investing in equities, this finding is consistent with previous literature uncovering evidence that investors in illiquid funds tend to be more sensitive to past performance. Second, looking at affiliated funds, it is clear that the lower sensitivity identified in the full sample mostly originates from investors in bond funds (opposing negative coefficient of -0.10), while there is only a non-significant difference with respect to outflows following underperformance at affiliated versus unaffiliated equity funds (-0.02).

In summary, the analysis of model (7) yields two main points. First, investors at bank-affiliated funds seem less inclined to run away following underperformance. Second, while for unaffiliated funds we find confirmation for the result that outflows following underperformance are particularly marked when the fund holds generally more illiquid assets, investors of bank-affiliated funds seem not to care about the composition of the fund's assets (and thus about their market liquidity) when reacting to bad performance, as outflows at these funds follow underperformance to a similar extent in bond funds and in equity funds (net correlations of 0.13 and 0.14, respectively).

Another indicator that bank-affiliated funds have a more stable and less pro-cyclical investor base is the volatility of their flows, which we would expect to be lower than for other comparable funds, as stated in Hypothesis 4. As flows react to performance, we also expect a more volatile performance to correlate with more volatile flows. Thus, we estimate the effect of bank affiliation on fund volatility, controlling for the standard deviation of fund returns as well as other fund characteristics:

$$\sigma(\text{Flows})_{jt} = \beta_1 \cdot \text{Affiliated}_{j,t-12} + \beta_2 \cdot \sigma(\text{Return})_{jt} + Controls_{j,t-12} + \gamma_{kt}, \qquad (8)$$

where we compute the standard deviation of monthly flows over the 12 months to month t and the standard deviation of monthly fund returns over months $t-12$ to $t-1$.

Table 6 presents the results of the estimation of (8) testing Hypothesis 4. In column (1), we start by including only month fixed effects. Although as conjectured we find evidence that funds with more volatile performance have more volatile flows, no significant difference arises between the volatility of flows of affiliated and unaffiliated funds. A high share of institutional investors is also associated with more volatile flows. Flows of bigger, more expensive and older funds instead fluctuate less.

In column (2), we add fund fixed effects to the estimation, thus identifying the effect of affiliation specifically for those funds whose affiliation status changed over the sample period. In other words, we look at the question of whether a *change in ownership* of a mutual fund has an impact on the variability of its flows. The effect of becoming bank-affiliated (resp. unaffiliated) is estimated to be stronger than before and statistically significant and decreases (resp. increases) the volatility of fund flows by 0.375, or 9% of the sample average. In this within-fund estimation, the volatility of performance does not have a significant impact on the volatility of flows. Adding time-varying peer group fixed effects strengthens statistical significance and size of the effect of affiliation (column (3)). Finally, column (4) shows that when an interaction term between affiliation and return volatility is added, affiliation has a double effect. More volatile returns correspond again to more volatile flows in unaffiliated funds, but the offsetting coefficient on the interaction term means that this sensitivity drops when a fund becomes affiliated, stabilising the fund's investor base.

A low volatility of fund flows is a desirable characteristic for fund managers because it reduces the thickness of the precautionary cash buffer that they have to hold in order to meet unexpected outflows, thereby freeing up resources that can be invested in risky assets to increase the fund's average return. An additional channel via which funds can benefit from the parent bank's role as investor of last resort is the following: if managers know they can rely on an emergency liquidity intervention, then they do not need to hold as much cash on a regular basis. We test this hypothesis by using the portfolio's cash percent allocation as a dependent variable, and estimate:

$$\begin{aligned}\text{Cash}_{jt} &= \beta_1 \cdot \text{Affiliated}_{jt} \times \text{Alternatives fund}_j + \beta_2 \cdot \text{Affiliated}_{jt} \times \text{Bond fund}_j + \\ &+ \beta_3 \cdot \text{Affiliated}_{jt} \times \text{Equity fund}_j + \beta_4 \cdot \text{Affiliated}_{jt} \times \text{Mixed fund}_j + Controls_{jt} + \gamma_{kt}.\end{aligned} \tag{9}$$

where $Cash_{jt}$ is the level of cash the fund is holding in percent of total assets at the end of month t. Fund controls include the volatility of monthly fund flows $\sigma(\textit{Fund flows})_{jt}$ computed over months $t-11$ to t and the contemporaneous flows, as well as the log of fund TNA and age, the total expense ratio, institutional ownership and six-month alpha. [6]

Table 7 presents the results of the estimation. First, we run (9) with simply fund and month fixed effects (column (1)). Larger, cheaper, and older funds hold less cash (not shown). The volatility of flows is also positively related to cash holdings. Taking equity funds as the base category, the estimation shows that the other three categories all hold higher level of cash on average, coherently with the fact that funds holding less liquid assets ought to insure themselves against extreme outflows. Unaffiliated alternatives funds allocate to cash a striking 15.5% more than equity funds, likely to balance their investment in particularly illiquid assets. The cash buffer of bond funds exceeds that of equity funds by 1.8 percentage points. The excess is 5.2 percentage points for mixed-assets funds, suggesting that, behind the generic denomination, some funds in this category may also invest in illiquid assets to a greater extent than bond funds. Looking at affiliated funds, equity funds and funds investing in alternative assets are able to limit their cash holdings, with the latter having on average 7 percentage point lower buffers than their unaffiliated peers. These results, however, might stem from a correlation between bank affiliation and the propensity to hold more liquid assets, which renders substantial cash buffers less essential. In order to compare funds with a more similar portfolio composition, it is necessary to test a more restrictive specification including month-peer group fixed effects, which also absorb the average cash holdings of funds by asset type. Column (2) shows that this estimation confirms the result that affiliated funds hold less cash, although the difference is not significant in the case of bond funds.

Another way of assessing the effect of bank affiliation on funds' capacity to slim down their cash holdings while assuaging the concern that this be due to differences in portfolio composition is to perform a within-fund estimation, exploiting those funds whose company's structure changed as a consequence of a merger or an acquisition. This allows us to study

[6] We exclude money market funds as these funds hold mostly liquid assets and cash-like assets customarily as part of their investment strategy.

how becoming bank-affiliated changes the fund's liquidity management strategy. In column (3) we do this by testing regression (9) with fund fixed effects. Although for the other three asset classes the coefficients turn non-significant, the estimation reveals that, after being acquired by a bank holding company or by a financial conglomerate including a bank, bond funds decrease their cash buffer by on average 1.6 percentage points.

Funds which can afford to hold lower cash buffers are purportedly those that can rely on direct liquidity support from the parent institution. In the previous analysis (Table 4), we found evidence that the capacity of banks to purchase affiliated funds' shares is positively related to their balance sheet solidity as measured by the capital ratio and, to some extent, the liquidity coverage ratio. Therefore, it is natural to test whether funds' cash allocation is affected by measures of financial solidity. Restricting the sample to bank affiliated funds, we estimate the regression:

$$\text{Cash}_{jt} = \beta_1 \cdot \text{Capital ratio}_{jt} \times \text{Alternatives fund}_j + \beta_2 \cdot \text{Capital ratio}_{jt} \times \text{Bond fund}_j + \beta_3 \cdot \text{Capital ratio}_{jt} \times \text{Equity fund}_j + \beta_4 \cdot \text{Capital ratio}_{jt} \times \text{Mixed fund}_j + Controls_{jt} + \gamma_{kt}, \tag{10}$$

Column (4) of Table 7 shows that, among bank-affiliated bond funds, each percentage point increase in the parent bank's capital ratio corresponds to 0.38% lower cash holdings. The result for mixed funds is similar in magnitude and statistical significance. As before, more volatile flows lead to higher cash holdings, but the corresponding coefficient is almost twice as big as in the previous sample: now, a one standard-deviation higher volatility ($\simeq 5$) leads to an additional 0.5 percentage point of cash buffer. Thus, next we ask the question whether volatile flows increase cash buffers in the same way irrespective of the parent bank's solidity. As a matter of fact, from column (5) it emerges that a higher bank capitalisation leads to a smaller influence of the volatility of outflows on the safety buffer. Column (6) shows that the standalone effect of the bank's capital ratio does not hold in the within-fund estimation, which might be due to its relative stability over time. Nevertheless, a high level of capital is still significant in determining a dampened sensitivity of cash buffers to flow volatility.

Finally, we run a sort of robustness test by replacing the bank capital ratio with the CDS spread. The motivation for this is twofold: first, since each of the two variables is only available for specific banks and time periods, the two estimations are run on two different subsets of our sample of affiliated funds that are not completely overlapping. Second, the CDS spread is arguably a better measure of investors' perception of financial solidity of a bank, because it captures expectations of financial markets as to a possible default of the institution and it instantaneously incorporates innovations.

Testing regression (10) with the CDS spread again yields evidence that bond funds of banks that are cosidered to be more solid (lower CDS spread) afford to keep lower cash holdings (columns (7) and (8)), while a lower CDS spread also induces a lower sensitivity of cash to the volatility of flows (column (8)). Only in the within-fund estimation is the CDS spread not significant in explaning cash holdings (column (9)).

In conclusion, these results again reinforce the view that the solidity of the parent bank, described by well-established measures such as the capital ratio and the CDS spread, is important in determining its ability to step in to support distressed affiliated funds, as well as in cementing the corresponding perception of stability among fund investors.

5.3 Affiliated funds' response to shocks and bank-fund contagion

5.3.1 Italy's 2018 political uncertainty

In the middle of May 2018 tensions started to loom over Italian sovereigns due to expectations that a new populist, anti-euro government would form. As investors cut down their exposure, the spread between 10-year Italian and German government bond yields increased from 123 bps to 243 bps in the course of May and June and remained on that level over the following months. An analysis of fund flows shows that deleveraging took place also in the asset management market, with investors fleeing those mutual funds characterised by a portfolio highly tilted towards Italian assets. To see this, we start by estimating the following fixed-effects specification at a monthly frequency:

$$\begin{aligned} \text{2-month flows}_{jt} &= \beta_1 \cdot \text{Fund Exp}^{Ita\ sov}_{j,t-1} \times \text{May '18}_t \\ +\beta_2 \cdot \text{Fund Exp}^{Ita\ sov}_{j,t-1} &\times \text{Affiliated}_{jt} \times \text{May '18}_t + Controls_{j,t-1} + \gamma_{kt} + \delta_j, \end{aligned} \tag{11}$$

where the dependent variable is the cumulative two-month flow of months t to $t+1$ at the fund level and $Fund\ Exp^{Ita\ sov}_{j,t-1}$ is a dummy variable that is equal to 1 if the fund's stated geographical focus is Italy or more than 25% of fund j's portfolio is invested in Italian bonds.[7] $May\ '18$ takes the value of 1 for observations referred to May 2018 and 0 otherwise. The results of the estimation in column (1) of Table 8 show that Italy-exposed funds were met with abnormal outflows in May and June 2018 (-2.26%, $p<0.01$), although bank-affiliated funds seem to experience more outflows compared to the others (offsetting coefficient of 0.66%, $p<0.01$). Column (2) shows that controlling for a fund's peer group, thereby comparing Italy-exposed and non-exposed funds with an otherwise high degree of similarity, the shock largely persists for unaffiliated funds (-2.08%, $p<0.01$), while it becomes less sizeable for exposed affiliated funds (offsetting coefficient of 1.17%, $p<0.01$).

The previous analysis of direct bank support via share purchases and of fund precautionary cash holdings revealed that differences in bank solidity help explain the average benefit yielded by bank affiliation. Following this insight, we aim to motivate the mitigated impact of the Italian crisis on exposed affiliated funds that we observed in columns (1) and (2) of Table 8 by looking at the cross section of parent banks. Thus, we look at affiliated funds and add to the explanatory variables the parent banks' CET1 and liquidity coverage ratios, when available. In columns (3) and (4) we see that both these characteristics have a significant impact on distressed mutual funds: each percentage point of higher CET1 ratio reduces outflows at exposed funds by 0.44 percentage points over the two crisis months, while a standard deviation difference in LCR reduces outflows at exposed funds by 0.51 percentage points (0.88×0.58).

The results for bank capital and liquidity corroborate the view that the financial condition

[7] To construct this measure, we primarily use the fund's portfolio allocation to Italian fixed income assets provided by Lipper. When this is missing, but full fund holdings are available, we compute directly the percentage allocation to Italian sovereign bonds in market value terms. We use up to two monthly lags of both variables to fill in missing values.

of the banking group played a role in determining the behavior of investors in their affiliated funds during this phase of unrest on markets. Along the same lines it is natural to ask the question of whether the exposure of the bank itself to the shock negatively affected fund investors. For instance, Italian banks are by default highly exposed to shocks around the Italian sovereigns because of the home bias in their sovereign bond portfolio and because of the wider sovereign-bank nexus, which posits that the deep dependence of banks on their sovereign means that a sovereign default would inevitably lead to a default of its banks irrespective of their financial solidity. Foreign banks with a considerable exposure to the Italian public sector may also be affected by an unexpected drop in the market value of their trading portfolio. To answer this question, in column (5) we study the effect of parent banks' nationality on fund flows, distinguishing Italian and non-Italian groups by means of a dummy variable. First, in this sample exposed funds incur on average 0.94% more outflows during the crisis. Moreover, the estimation reveals that funds affiliated to Italian banks also suffer 0.5% higher outflows. However, this additional effect vanishes for funds themselves already exposed to the shock. Next, we replace the dummy variable *Italian parent* with a continuous variable representing the percent exposure of a bank to Italian assets, and we exclude from the sample Italian institutions (as for this banks the mere nationality is a more salient measure of distress than are differences in actual portfolio exposure). The estimation yields qualitatively similar results: while outflows at Italy-exposed funds signal distress unconditional on the parent's exposure, funds with low holdings of Italian bonds also suffer abnormal outflows if the parent bank owns a relatively large portfolio of Italian assets.

In summary, the analysis of a local shock affecting a specific section of the financial market corroborates previous evidence pointing to the fact that financially solid banking groups help affiliated funds to better withstand distress, in the sense that they are less likely to fall victim to severe outflows. However, it also reveals the existence of the opposite channel: mutual funds with an exposed parent are subject to outflows even if they do not have a direct exposure to the shock via holdings of distressed assets. This result uncovers a novel channel according to which the dependence of a business unit on expectations of a safety net within its financial conglomerate leads to financial contagion as a consequence of distress outside the unit undermining these expectations.

5.3.2 Brexit referendum

The outcome of the Brexit referendum of 23 June 2016 was deemed as largely unexpected. The decision to leave the EU threw the UK financial services industry into disarray and spooked investors in UK-focused investment funds (Lewin (2016)). We study how this shock affected affiliated and unaffiliated mutual funds by estimating the following fixed-effects specification at a monthly frequency:

$$\begin{aligned}\text{2-month flows}_{jt} &= \beta_1 \cdot \text{Fund Exp}^{UK}_{j,t-1} \times \text{June '16}_t \\ +\beta_2 \cdot &\text{Fund Exp}^{UK}_{j,t-1} \times \text{Affiliated}_{jt} \times \text{June '16}_t + Controls_{j,t-1} + \gamma_{kt} + \delta_j,\end{aligned} \tag{12}$$

where the dependent variable is the cumulative two-month flows of months t and $t+1$ at the fund level, and *Fund* $Exp^{UK}_{j,t-1}$ is a dummy variable that is equal to 1 if more than 25%

of fund j's portfolio is invested in UK assets. *June '16*$_t$ takes the value of 1 for observations referred to June 2016 and 0 otherwise. When aggregating variables at the fund share class level to the fund portfolio level, we drop share classes denominated in GBP in order to abstract from exchange rate fluctuation, as the sterling depreciated starkly following the Brexit referendum.

The results of the estimation in column (1) of Table 9 confirm the hypothesis that UK-exposed funds were met with abnormal outflows in June and July 2016. For non-affiliated funds with above-threshold exposure to the UK in the wake of the referendum, the flows are estimated to be 2.62% lower after controlling for month and fund fixed effects, past performance and other fund characteristics (coefficient of *Fund Exp*$^{UK}\times$ *June '16*). However, bank-affiliated funds experienced 0.41% less outflows compared to their unaffiliated peers (non-significant coefficient of *Fund Exp*^{UK} $\times$ *Affiliated* $\times$ *June '16*). Controlling for a fund's peer group in column (2) further shows that, even among funds with similar investment styles, outflows for UK-exposed unaffiliated funds are still highly significant and estimated at -1.02%, but affiliated funds are largely shielded (offsetting coefficient of 0.73%).

In a further attempt to identify more precisely the funds most adversely hit by the shock, we look at their portfolio allocation in terms of industry sector. The UK financial sector was allegedly the most exposed to risks resulting from a disorderly exit from the European Union. Therefore, in the next test we repeat the estimation after taking this into account. As the portfolio allocation in terms of geography and industry reported by Lipper are independent of each other, we construct the dummy *Fund Exp*$^{UK\ Fin}$ which is equal to 1 under both the condition that *Fund Exp*^{UK} be 1 and the additional condition that the portfolio allocation to the financial sector be greater than 25%. Columns (3) and (4) show that, as expected, the estimated outflows in June 2016 for unaffiliated funds with both a large exposure to UK assets and a large exposure to the financial sector are several times greater than those estimated previously for funds with *Fund Exp*^{UK} $= 1$ (-8.07% in the model with time fixed effects and -5.81% in the model with time-varying peer-group fixed effects). However, remarkably affiliated funds are still largely insulated from the shock, with little or no abnormal outflows (offsetting coefficients of 5.84% and 6.66%).

As affiliated funds on average do not seem to be affected by the Brexit referendum, we next investigate whether this is also true for funds affiliated to potentially vulnerable banks. If any banks in our sample fail to meet investor expectations of providing emergency support to UK-exposed funds in the aftermath of the Brexit vote upheaval, we conjecture that they would be those presenting particularly weak balance sheet ratios. Therefore, we identify with two dummies – respectively *Low Cap.* and *Low Liq.* – those observations where respectively the bank's CET1 ratio and the bank's LCR lie below the lower quartile of their distribution across the sample. The two dummies have a 9% correlation. Columns (5) and (6) present the result of the estimation of regression (12) with the corresponding additional interactions. Interestingly, low-capital banks have an adverse effect not only on highly UK-exposed funds, but also on other funds (baseline outflows for both categories of -0.73%). Additionally, exposed funds affiliated to less liquid and to less capitalised banks suffer more outflows than the rest of the bank-affiliated funds in the two-month period (respectively -1.51% and -1.55%). As a further test, next we take the bank CDS spread as measure of bank distress. We define a dummy *High CDS* which is equal to 1 when the bank's CDS spread is above 100 bps, which is approximately the upper quartile of its distribution over the sample. The correlation of this dummy with *Low Cap.* is -13%, with *Low Liq.* 4%, indicating that the CDS spreads is not simply aligned to some of the balance sheet metrics. In column (7) we run regression (12) with *High CDS* and we find that funds owned by these risky banks do suffer Brexit-related distress (0.49% larger outflows for all funds plus 1.68% larger outflows for funds with large UK exposure).

These results suggest that, as was the case during the Italian crisis, the financial conditions of the banking arm – in particular for especially vulnerable institutions – influenced the investment decisions of investors in the group's funds following financial uncertainty, partly irrespective of the funds' own exposure. Thus, in our final test we address the question of whether investors withdrew their shares of funds belonging to a British financial conglomerate or to a British asset management company following the Brexit vote. We make use of a dummy variable that indicates whether the fund's ultimate parent is a UK company, and we focus directly on a sample of affiliated and unaffiliated funds that are not heavily invested in UK assets, excluding all funds with an exposure higher than 20%. Then, any outflows would be arguably motivated by the uncertainty surrounding the future prospects of the fund's company and the doubts about its continued ability to provide financial guarantees to its mutual funds business.[8]

Column (8) illustrates the results. Investors of funds belonging to UK companies – including banks, independent asset managers and other financial firms – withdraw on average 1.28% more of the fund's TNA in two months, compared to funds operated by non-UK companies but investing in the same asset type, with the same benchmark and geographical focus. Remarkably, the interaction with the *Affiliated* dummy shows that the fallout is more sizeable specifically for funds belonging to UK banks: in this case, average outflows increase by an additional 0.91%.

Our findings have important implications. On one hand, the analysis of the mutual fund sector following the surprise Brexit vote shows again that funds belonging to a financially sound banking conglomerate seem to be shielded from shocks which do not affect their parent bank, arguably because these funds are perceived to be safer from investors. On the other hand, it also suggests that in case of shocks affecting directly the parent bank – such as the unexpected outcome of the Brexit vote for English financial institutions – distress can spill over to the asset management arm of a financial conglomerate, in that fund investors are induced to run to safety and withdraw capital.

6 Conclusion

In this paper, we provide evidence suggesting that banks provide liquidity insurance to distressed affiliated funds by increasing their stakes in those funds that are experiencing large outflows. This dampens the severity of strategic complementarities in investors' redemptions and thus diminishes the propensity of a run among investors. We showed that, as a result, investor flows of bank-affiliated funds tend to be less volatile and less sensitive to bad performance, which in turn allow these funds to hold lower precautionary cash buffers.

[8]We also use the exposure of a fund's parent bank to UK assets, but we do not find this to significantly influence fund flows.

Our further analysis shows that these beneficial effects are particularly strong if the parent bank is more liquid and better capitalised. This suggests that those funds that are part of a multi-unit financial group directly benefit from the solidity of the parent institution. At the same time, it suggests that a worsening of a conglomerate's financial health or adverse shocks to the banking business may spill over to the asset management side even absent a direct link in the mutual funds in the form of portfolio exposure.

Although evidence indicates that funds invested in Italy and the United Kingdom were more resilient to episodes of distress in their respective market segment if they were affiliated to well capitalised and liquid banks, we also found that – conversely – investors ran on funds that were in principle not exposed to the shock following distress in the parent bank. Our research highlights substantial dependencies between the banking system and the asset management industry and identifies an important channel via which financial stability risks depend on the organizational structure of the financial sector.

References

Bagattini, G., F. Fecht, and P. Weber (2018). The fire-sale channels of universal banks in the european sovereign debt crisis.

Ber, H., Y. Yafeh, and O. Yosha (2001). Conflict of interest in universal banking: Bank lending, stock underwriting, and fund management. *Journal of Monetary Economics 47*(1), 189–218.

Bhattacharya, U., J. H. Lee, and V. K. Pool (2013). Conflicting family values in mutual fund families. *Journal of Finance 68*(1), 173–200.

Chen, Q., I. Goldstein, and W. Jiang (2010). Payoff complementarities and financial fragility: Evidence from mutual fund outflows. *Journal of Financial Economics 97*, 239–262.

Coval, J. and E. Stafford (2007). Asset fire sales (and purchases) in equity markets. *Journal of Financial Economics 86*(2), 479–512.

Eisele, A., T. Nefedova, G. Parise, and K. Peijnenburg (2020). Trading out of sight: An analysis of cross-trading in mutual fund families. *Journal of Financial Economics 135*(2), 359–378.

Fecht, F., E. Genc, and Y. Karabulut (2018). Liquidity support in financial institutions.

Fecht, F. and M. Wedow (2014). The dark and the bright side of liquidity risks: Evidence from open-end real estate funds in Germany. *Journal of Financial Intermediation 23*(3), 376–399.

Ferreira, M. A., P. Matos, and P. Pires (2018). Asset Management within Commercial Banking Groups: International Evidence. *Journal of Finance 73*(5), 2181–2227.

Franzoni, F. and M. Giannetti (2019). Costs and benefits of financial conglomerate affiliation: Evidence from hedge funds. *Journal of Financial Economics 134*(2), 355–380.

Gaspar, J.-M., M. Massa, and P. Matos (2006). Favoritism in mutual fund families? evidence on strategic cross-fund subsidization. *Journal of Finance 61*(1), 73–104.

Gil-Bazo, J., P. Hoffmann, and S. Mayordomo (2019). Mutual funding. *Review of Financial Studies*.

Goldstein, I., H. Jiang, and D. T. Ng (2017). Investor flows and fragility in corporate bond funds. *Journal of Financial Economics 126*, 592–613.

Golez, B. and J. M. Marin (2015). Price support by bank-affiliated mutual funds. *Journal of Financial Economics 115*(3), 614–638.

IMF (2015). Global financial stability report, april 2015: Navigating monetary policy challenges and managing risks. `https://www.imf.org/~/media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/gfsr/2015/01/pdf/_text.ashx`.

Kacperczyk, M. and P. Schnabl (2013). How safe are money market funds? *Quarterly Journal of Economics 128*(3), 1073–1122.

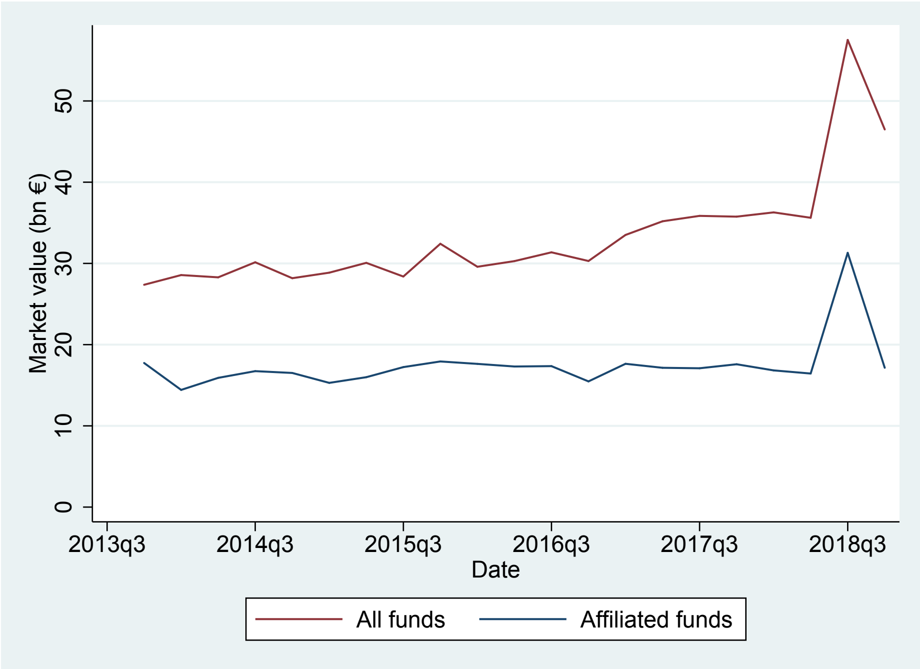
Lewin, J. (2016, August). Brexit fund outflows topped 2008 peak. *Financial Times*. `https://www.ft.com/content/8a8055a9-e9dc-399e-bf0d-6d859697cc1d`.

Massa, M. and Z. Rehman (2008). Information flows within financial conglomerates: Evidence from the banks-mutual funds relation. *Journal of Financial Economics 89*(2), 288–306.

Mola, S. and M. Guidolin (2009). Affiliated mutual funds and analyst optimism. *Journal of Financial Economics 93*(1), 108–137.

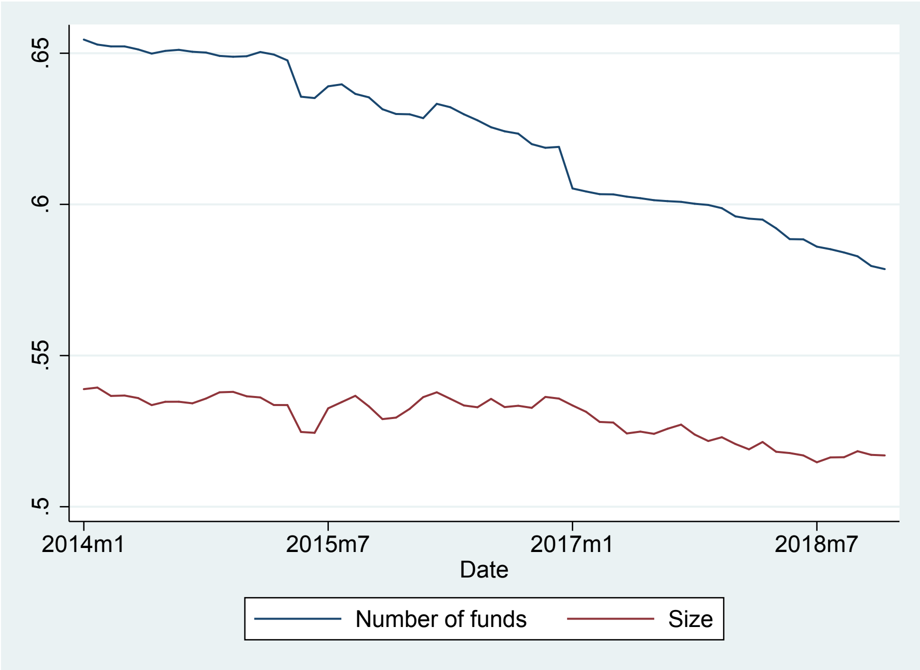
A Figures

Figure 1: Banks' holdings of mutual fund shares.



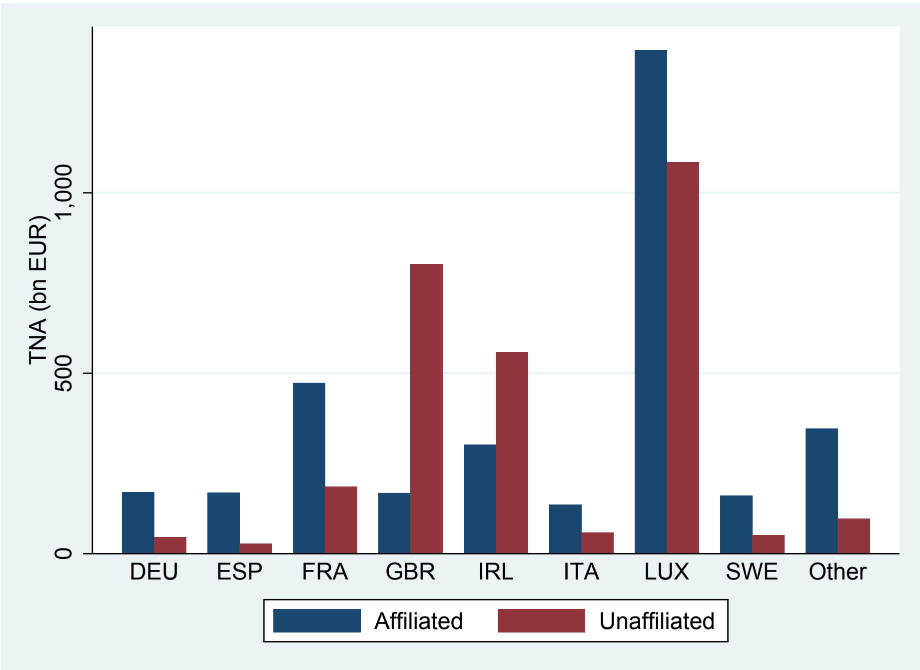
The graph plots the market value of mutual fund shares (red line) and shares of mutual funds affiliated to the holding bank (blue line) in the portfolios of 26 banking groups reporting for the Securities Holdings Statistics.

Figure 2: Share of EU funds affiliated to a bank.



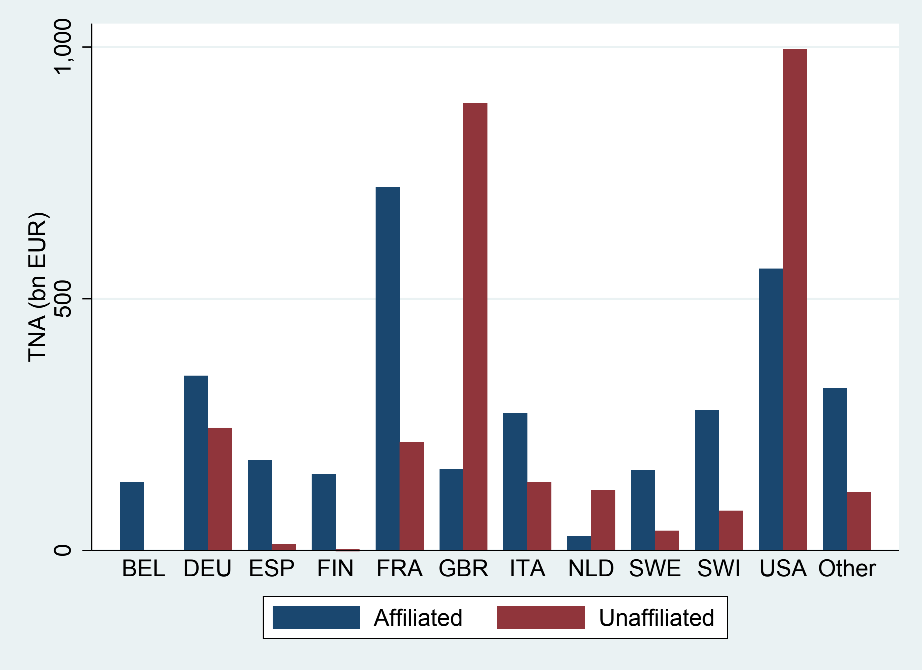
The graph plots the share of bank-affiliated funds in the Lipper sample of mutual funds domiciled in the European Union in terms of number of primary funds (blue line) and in terms of funds' aggregate TNA (red line).

Figure 3: Domicile country of EU mutual funds.



This figure shows the aggregate TNAs of bank-affiliated funds (blue bars) and unaffiliated funds (red bars) broken down by country of domicile in the Lipper sample of mutual funds domiciled in the European Union in June 2016.

Figure 4: Country of EU mutual funds' ultimate parents.



This figure shows the aggregate TNAs of bank-affiliated funds (blue bars) and unaffiliated funds (red bars) broken down by country of their ultimate parent in the Lipper sample of mutual funds domiciled in the European Union in June 2016.

B Tables

Table 1: Definition of dependent and independent variables.

Dependent variables	
Bank flows$_{ijt}$	Percent fund flows originated by bank i trading fund share j during quarter t (see definition (3)). This variable exists if fund j is in bank i's portfolio in at least quarter $t-1$ or quarter t.
Fund flows$_{kt}$	Percent flows for fund k in month t (see definition (2)).
2m flows$_{jt}$	Cumulative percent flows for fund j in months t and $t+1$.
σ(Flows)$_{jt}$	Standard deviation of monthly flows for fund j computed over a 12-month period from $t-11$ to t if at least 5 data points are not missing.
Cash %$_{jt}$	Percent portfolio allocation to cash and cash-like instruments for fund j at the end of month t.
Independent variables	
Affiliated$_{ikt}$	In the bank-holdings sample, binary variable which is equal to 1 if mutual fund k is affiliated to bank i at the end of quarter t and 0 otherwise; in the mutual funds sample without index i, it is equal to 1 if fund k in month t is part of a bank holding company or a financial conglomerate which includes banking activities.
Non-bank flows$_{kt}$	Percent flows for fund k in quarter t, net of flows originating from banks in the bank-holdings sample (see definition (4)).
Is outflow$_{kt}$	Binary variable which is equal to 1 if Non-bank flows$_{kt}$ is strictly negative, 0 otherwise.
Distress$_{kt}$	Binary variable which is equal to 1 if Non-bank flows$_{kt}$ is below the 5th percentile in the corresponding sample, 0 otherwise.
High capital$_{ijt}$	Binary variable which is equal to 1 if bank i's CET1 ratio is above the upper quartile in the corresponding sample, 0 otherwise.
High liquidity$_{ijt}$	Binary variable which is equal to 1 if bank i's liquidity coverage ratio is above the upper quartile in the corresponding sample, 0 otherwise.
Holding size$_{ijt}$	Market value of bank i's holding in fund share j in quarter t divided by the aggregate TNA of the fund and multiplied by 100.
6-month alpha$_{jt}$	Jensen's alpha of fund j over months $t-6$ to $t-1$, computed based on the fund's Lipper Global classification benchmark.
σ(Return)$_{jt}$	Standard deviation of fund j's monthly returns computed over a 12-month period from $t-12$ to $t-1$ if at least 5 data points are not missing.
σ(Flows)$_{jt}$	See *Dependent variables.*
Log(TNA)$_{jt}$	Natural logarithm of fund j's Total Net Assets (in € million) at the end of month t.
Fund TER$_{jt}$	Total expense ratio of fund j in month t.
Log(Age)$_{jt}$	Natural logarithm of fund j's age (expressed in months) at month t.
Institutional ownership$_{jt}$	Value-weighted fraction of fund j's share classes reserved for institutional investors in month t.
Capital ratio$_{jt}$	Capital ratio of the parent bank of fund j in month t.
Bank CET1$_{jt}$	CET1 ratio of the parent bank of fund j in month t.
Low capital$_{jt}$	Binary variable which is equal to 1 if the CET1 ratio of the parent bank of fund j is below the lower quartile in the corresponding sample, 0 otherwise.

Table 1: Definition of dependent and independent variables.

Bank LCR_{jt}	Liquidity coverage ratio of the parent bank of fund j in month t.
Low $liquidity_{jt}$	Binary variable which is equal to 1 if the liquidity coverage ratio of the parent bank of fund j is below the lower quartile in the corresponding sample, 0 otherwise.
CDS $spread_{jt}$	5-year CDS spread of the parent bank of fund j in month t (normally 2014 modified-modified restructuring contracts in Euro).
High CDS_{jt}	Binary variable which is equal to 1 if the parent bank of fund j has a CDS spread higher than 100 at the end of month t, 0 otherwise.
Alternatives $fund_{j}$	Binary variable which is equal to 1 if fund j is classified as an alternative assets fund, 0 otherwise.
Bond $fund_{j}$	Binary variable which is equal to 1 if mutual fund j is classified as a bond fund, 0 otherwise.
Equity $fund_{j}$	Binary variable which is equal to 1 if mutual fund j is classified as an equity fund, 0 otherwise.
Mixed $fund_{j}$	Binary variable which is equal to 1 if mutual fund j is classified as a mixed assets fund, 0 otherwise.
Fund $Exp._{jt}^{Ita\ Sov}$	Binary variable which is equal to 1 if fund j's portfolio is invested for at least 20% in Italian sovereign bonds (for those funds reporting securities holdings) or at least 25% in Italian bonds (for those funds reporting a geographical portfolio allocation) at the end of month t, or if the geographical focus in the fund prospectus is Italy; 0 otherwise.
Bank $Exp_{jt}^{Ita\ Sov}$	Balance sheet exposure of the parent bank of fund j to Italian sovereign bonds at the end of month t, expressed as a percent of the bank's total assets.
Italian $parent_{jt}$	Binary variable which is equal to 1 if the ultimate parent of fund j's asset management company is Italian; 0 otherwise.
Fund Exp_{jt}^{UK}	Binary variable which is equal to 1 if fund j's portfolio is invested for at least 25% in United Kingdom securities (according to reported securities holdings or geographical portfolio allocation) at the end of month t, or if the geographical focus in the fund prospectus is the United Kingdom; 0 otherwise.
Fund $Exp_{jt}^{UK\ Fin}$	Binary variable which is equal to 1 if Fund Exp_{jt}^{UK} is 1 and additionally at least 25% of the portfolio is invested in financial sector assets at the end of month t; 0 otherwise.
UK $parent_{jt}$	Binary variable which is equal to 1 if the ultimate parent of fund j's asset management company is from the United Kingdom; 0 otherwise.
June $'16_{t}$	Binary variable which is equal to 1 if t is June 2016, 0 otherwise.
May $'18_{t}$	Binary variable which is equal to 1 if t is May 2018, 0 otherwise.

Table 2: Summary statistics for main dependent and independent variables.

Panel A: sample of bank holdings of mutual fund shares.

	Mean	St. dev.	p1	p5	p25	Median	p75	p95	p99	N
Bank flows (%)	-0.03	3.13	-4.23	-0.16	-0	0	0	0.15	3.19	116821
Non-bank flows (%)	0.17	14.32	-31.47	-15.83	-5.04	-1.14	2.83	20.56	53.56	116821
Is outflow	0.61	0.49	0	0	0	1	1	1	1	116821
Distress	0.05	0.22	0	0	0	0	0	1	1	116821
Affiliated	0.20	0.40	0	0	0	0	0	1	1	116821
CET1 ratio (%)	11.68	1.83	8.15	9.51	10.49	11.34	12.94	14.94	17.53	116808
LCR	1.44	0.30	0	1.16	1.32	1.44	1.49	1.99	2.27	74263
Holding size (%)	2.49	11.89	-3.16e-03	0	6.34e-05	1.05e-03	0.09	9.64	84.36	116821

Panel B: sample of European mutual funds.

	Mean	St. dev.	p1	p5	p25	Median	p75	p95	p99	N
Affiliated funds										
Fund flows (%)	-0.16	7.45	-20.34	-7.20	-1.52	-0.26	0.55	7.22	22.72	683665
Return (%)	0.25	2.29	-7.51	-3.59	-0.50	0.11	1.11	4.15	7.57	683665
6-month alpha (%)	0.16	2.37	-7.10	-3.60	-0.90	0	1.20	4.20	8	683665
Cash (%)	6.01	9.92	-9.01	-0.22	1.29	3.28	7.17	21.12	49.18	264379
Fund Exp.$^{Ita\ Sov}$	0.12	0.32	0	0	0	0	0	1	1	385346
Fund Exp.^{UK}	0.03	0.16	0	0	0	0	0	0	1	371328
Fund Exp.$^{UK\ Fin}$	0.01	0.09	0	0	0	0	0	0	0	216907
UK parent	0.02	0.14	0	0	0	0	0	0	1	637900
Italian parent	0.08	0.27	0	0	0	0	0	1	1	664333
Log(TNA)	4.27	1.48	1.70	2.04	3.13	4.16	5.27	6.83	8.03	683665
Fund TER (%)	1.35	0.73	0.09	0.27	0.81	1.30	1.82	2.60	3.35	640420
Log(Age)	4.40	0.95	2.08	2.63	3.76	4.55	5.16	5.68	5.99	683586
Institutional ownership	0.14	0.31	0	0	0	0	0	1	1	683665
Bond fund	0.28	0.45	0	0	0	0	1	1	1	683665
Equity fund	0.32	0.47	0	0	0	0	1	1	1	683665
Mixed fund	0.31	0.46	0	0	0	0	1	1	1	683665
Bank exposure to Ita. sov.	1.75	2.94	0	0.04	0.24	0.81	1.21	9.84	12.39	355571
Capital ratio (%)	16.89	2.83	10.18	12.20	14.77	17.10	18.96	21.29	23.21	410742
CET1 ratio (%)	12.92	2.55	8.54	9.68	11.05	12.59	14.39	17.41	20.71	410742
LCR	1.60	0.79	0	1.11	1.33	1.42	1.53	3.22	4.66	258785
CDS spread	86.53	66.81	22.29	31.70	58.01	74.13	95.34	170.03	265.36	374195
Unaffiliated funds										
Fund flows (%)	0.31	7.53	-18.66	-6.41	-1.15	-0.02	1.05	7.76	23.48	399233
Return (%)	0.31	2.50	-7.80	-4.06	-0.69	0.21	1.46	4.58	7.77	399233
6-month alpha (%)	0.21	2.52	-7.34	-3.83	-1	0.10	1.40	4.51	8.30	399233
Cash (%)	6.14	9.59	-10	-0.13	1.29	3.43	7.63	21.54	47.56	181267
Fund Exp.$^{Ita\ Sov}$	0.08	0.27	0	0	0	0	0	1	1	252343
Fund Exp.^{UK}	0.03	0.18	0	0	0	0	0	0	1	177115
Fund Exp.$^{UK\ Fin}$	0.01	0.09	0	0	0	0	0	0	0	115537
UK parent	0.14	0.35	0	0	0	0	0	1	1	281029
Italian parent	0.09	0.29	0	0	0	0	0	1	1	378053
Log(TNA)	4.50	1.55	1.72	2.11	3.31	4.41	5.57	7.17	8.27	399233
Fund TER (%)	1.43	0.76	0.08	0.28	0.89	1.42	1.86	2.75	3.69	375819
Log(Age)	4.41	0.94	2.08	2.64	3.81	4.55	5.14	5.74	6.07	398837
Institutional ownership	0.21	0.37	0	0	0	0	0.25	1	1	399233
Bond fund	0.23	0.42	0	0	0	0	0	1	1	399233
Equity fund	0.39	0.49	0	0	0	0	1	1	1	399233
Mixed fund	0.32	0.46	0	0	0	0	1	1	1	399233
Bank exposure to Ita. sov.	.	.	.	.	.	.	.	.	.	0
Capital ratio (%)	.	.	.	.	.	.	.	.	.	0
CET1 ratio (%)	.	.	.	.	.	.	.	.	.	0
LCR	.	.	.	.	.	.	.	.	.	0
CDS spread	.	.	.	.	.	.	.	.	.	0

Table 3: Bank purchases of affiliated fund shares. Test of Hypotheses 1 and 2 based on model (5).

	(1) Bank flows	(2) Bank flows	(3) Bank flows	(4) Bank flows	(5) Bank flows	(6) Bank flows
Affiliated	-0.377***	-0.376***	-0.114*	-0.200**	-0.215**	-0.173*
	(-3.33)	(-3.46)	(-1.86)	(-2.78)	(-2.68)	(-1.98)
Non-bank flows	-0.0145**	-0.0147**		-0.00730	-0.00767	-0.00545
	(-2.08)	(-2.13)		(-1.65)	(-1.64)	(-1.49)
Is Outflow	-0.398**	-0.367**		-0.145	-0.129	-0.0956
	(-2.32)	(-2.33)		(-1.57)	(-1.53)	(-1.60)
Non-bank flows × Is Outflow	-0.0333*	-0.0326*		-0.0129	-0.0129	-0.0121**
	(-2.04)	(-2.05)		(-1.50)	(-1.52)	(-2.23)
Non-bank flows × Affiliated	-0.0167	-0.0164	-0.0138	-0.00434	-0.00497	-0.00754
	(-1.44)	(-1.44)	(-1.70)	(-0.89)	(-0.97)	(-1.57)
Non-bank flows × Is Outflow × Affiliated	-0.134***	-0.130***	-0.00107	-0.0596***	-0.0597***	-0.0579***
	(-3.22)	(-3.36)	(-0.08)	(-2.94)	(-2.90)	(-3.00)
Bank fixed effects	Yes	No	No	Yes	No	No
Fund fixed effects	Yes	Yes	No	Yes	Yes	Yes
Bank-quarter fixed effects	No	Yes	Yes	No	Yes	Yes
Fund-quarter fixed effects	No	No	Yes	No	No	No
Fund peer group-quarter fixed effects	No	No	No	No	No	Yes
Observations	115836	115817	35905	100493	100469	96927
R^2	0.151	0.187	0.541	0.096	0.111	0.239
Sample	Full	Full	Full	Partial trades	Partial trades	Partial trades

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of different versions of regression (5) where the dependent variable *Bank flows* is a bank's net purchase/sale of a mutual fund share expressed in percent of the fund's TNA. Columns (3)-(6) include only observations where the bank holding is positive in both the periods used to calculate bank trades. Quarter-peer group fixed effects represent a set of dummies for each combination of quarter and fund's asset type, benchmark technical indicator and geographical focus. Fund fixed effects are at the fund's share class level. The t-statistics reported in parentheses use standard errors clustered at the fund level and at the bank level.

Table 4: Bank purchases of affiliated fund shares. Test of Hypotheses 1 and 2 based on model (6).

	(1) Bank flows	(2) Bank flows	(3) Bank flows	(4) Bank flows	(5) Bank flows	(6) Bank flows	(7) Bank flows	(8) Bank flows	(9) Bank flows	(10) Bank flows
Affiliated	-0.0919**	-0.0740*	-0.0376	-0.0241	-0.0730*	-0.0483**	-0.0543**	-0.0288	-0.00570	0.110
	(-2.50)	(-1.94)	(-1.16)	(-0.67)	(-2.08)	(-2.09)	(-2.67)	(-0.62)	(-0.21)	(1.36)
Distress	0.364*	0.357*				0.190	0.182			0.0175
	(1.96)	(1.99)				(1.48)	(1.50)			(0.35)
Distress × Affiliated	1.458**	1.457**	0.153	-0.0111	0.193	0.412**	0.421**	-0.125	-0.0778	0.417**
	(2.49)	(2.76)	(0.71)	(-0.06)	(0.43)	(2.15)	(2.17)	(-1.37)	(-0.88)	(2.33)
Affiliated × High Capital				-0.0570				-0.0360		
				(-0.85)				(-0.53)		
Distress × High Capital				-0.111				-0.0494		
				(-1.12)				(-0.71)		
Distress × Affiliated × High Capital				0.724**				0.354**		
				(2.10)				(2.26)		
Affiliated × High Liquidity					0.111				-0.263	
					(0.41)				(-1.37)	
Distress × High Liquidity					-0.0781				-0.00875	
					(-0.81)				(-0.27)	
Distress × Affiliated × High Liquidity					1.795				0.348*	
					(1.51)				(1.91)	
Holding size										-0.129**
										(-2.40)
Distress × Holding size										0.145***
										(3.64)
Affiliated × Holding size										-0.00545
										(-0.09)
Distress × Affiliated × Holding size										-0.131**
										(-2.76)
Bank fixed effects	Yes	No	No	No	No	Yes	No	No	No	No
Fund fixed effects	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes
Bank-quarter fixed effects	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Fund-quarter fixed effects	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No
Fund peer group-quarter fixed effects	No	No	No	No	No	No	No	No	No	Yes
Observations	69117	69075	21916	21916	12874	60769	60722	16051	9463	57939
R^2	0.243	0.285	0.555	0.555	0.503	0.171	0.201	0.516	0.498	0.328
Sample	Outflows	Outflows	Outflows	Outflows	Outflows	Partial trades	Partial trades	Partial trades	Partial trades	Partial trades

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of different versions of regression (6) where the dependent variable *Bank flows* is a bank's net purchase/sale of a mutual fund share expressed in percent of the fund's TNA. The sample contains only observations where *Is Outflow* $= 1$. Columns (6)-(10) include only observations where the bank holding is positive in both the periods used to calculate bank trades. Quarter-peer group fixed effects represent a set of dummies for each combination of quarter and fund's asset type, benchmark technical indicator and geographical focus. Fund fixed effects are at the fund's share class level. The t-statistics reported in parentheses use standard errors clustered at the fund level and at the bank level.

Table 5: Sensitivity of fund flows to negative performance. Test of Hypothesis 3.

	(1) Fund flows	(2) Fund flows	(3) Fund flows	(4) Fund flows
6-month alpha $\times \mathbb{1}_{\text{6-month alpha}>0}$	0.153***	0.170***	0.166***	0.312***
	(9.10)	(9.61)	(8.26)	(5.92)
6-month alpha $\times \mathbb{1}_{\text{6-month alpha}>0} \times$ Affiliated	-0.00766	-0.0259*	-0.0752***	0.00709
	(-0.48)	(-1.70)	(-3.63)	(0.16)
6-month alpha $\times \mathbb{1}_{\text{6-month alpha}<0}$	0.178***	0.187***	0.161***	0.227***
	(14.47)	(16.14)	(11.44)	(4.79)
6-month alpha $\times \mathbb{1}_{\text{6-month alpha}<0} \times$ Affiliated	-0.0864***	-0.0640***	-0.0196	-0.101**
	(-5.94)	(-4.44)	(-1.15)	(-2.24)
6-month alpha $\times \mathbb{1}_{\text{6-month alpha}>0} \times$ Institutional ownership	0.0261	0.0386*	0.0663**	-0.103*
	(1.14)	(1.72)	(2.10)	(-1.76)
6-month alpha $\times \mathbb{1}_{\text{6-month alpha}<0} \times$ Institutional ownership	0.173***	0.159***	0.110***	0.150**
	(7.36)	(6.73)	(3.39)	(2.43)
Affiliated	-0.369***	-0.185***	0.00362	-0.235***
	(-11.51)	(-5.92)	(0.08)	(-3.65)
Log(TNA)	0.0509***	0.00828	-0.0164	-0.0248
	(5.40)	(0.93)	(-1.33)	(-1.62)
Fund TER	0.0618**	-0.0682***	0.0416	-0.197***
	(2.34)	(-3.11)	(1.31)	(-2.73)
Log(Age)	-0.349***	-0.479***	-0.462***	-0.443***
	(-17.17)	(-22.28)	(-16.51)	(-13.31)
Institutional ownership	0.360***	0.184***	0.0574	0.236**
	(6.33)	(3.59)	(0.66)	(2.55)
L(Fund flows)	0.196***	0.182***	0.154***	0.185***
	(28.18)	(26.60)	(22.61)	(20.80)
Month fixed effects	Yes	No	No	No
Month-peer group fixed effects	No	Yes	Yes	Yes
Observations	1054892	1034853	376318	273908
R^2	0.050	0.099	0.079	0.115
Sample	Full	Full	Equity funds	Bond funds

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of regression (7), where the dependent variable is monthly percent fund flows. In column (3) the sample is restricted to equity funds; in column (4) it is restricted to bond funds. Month-peer group fixed effects represent a set of dummies for each combination of month and fund's asset type, Lipper Global classification scheme and geographical focus. The *t*-statistics reported in parentheses use standard errors clustered at the fund level and at the month level.

Table 6: Volatility of fund flows. Test of Hypothesis 4.

	(1) σ(Flows)	(2) σ(Flows)	(3) σ(Flows)	(4) σ(Flows)
Affiliated $_{t-12}$	-0.0397	-0.375**	-0.410***	-0.272*
	(-0.74)	(-2.61)	(-2.87)	(-1.76)
σ(Return)	0.117***	-0.0177	0.0530	0.0936**
	(4.25)	(-0.66)	(1.58)	(2.53)
Institutional ownership $_{t-12}$	2.089***	1.115***	1.112***	1.115***
	(20.67)	(3.64)	(3.60)	(3.61)
Log(TNA) $_{t-12}$	-0.199***	-1.867***	-1.945***	-1.945***
	(-12.40)	(-19.52)	(-19.08)	(-19.09)
Fund TER $_{t-12}$	-0.731***	0.239***	0.188**	0.188**
	(-17.89)	(3.30)	(2.54)	(2.54)
Log(Age) $_{t-12}$	-0.315***	-0.283***	-0.191**	-0.191**
	(-11.54)	(-3.37)	(-2.10)	(-2.09)
Affiliated $_{t-12} \times \sigma$(Return)				-0.0671**
				(-2.19)
Month fixed effects	Yes	Yes	No	No
Month-peer group fixed effects	No	No	Yes	Yes
Fund fixed effects	No	Yes	Yes	Yes
Observations	783662	783218	767705	767705
R^2	0.049	0.570	0.588	0.588

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of different versions of regression (8) where the dependent variable is the volatility of monthly fund flows over the previous 12 months. All regressors except $\sigma(Return)$ are at month $t-12$. $\sigma(Return)$ is the volatility of monthly fund returns over months from $t-12$ to $t-1$. Month-peer group fixed effects represent a set of dummies for each combination of month and fund's asset type, Lipper Global classification scheme and geographical focus. The t-statistics reported in parentheses use standard errors clustered at the fund level and at the month level.

Table 7: The influence of parent banks on funds' cash buffers. Test of Hypothesis 5.

	(1) Cash %	(2) Cash %	(3) Cash %	(4) Cash %	(5) Cash %	(6) Cash %	(7) Cash %	(8) Cash %	(9) Cash %
Alternative fund	15.45***								
	(9.37)								
Bond fund	1.799***								
	(8.04)								
Mixed fund	5.226***								
	(20.35)								
Affiliated × Alternative fund	-7.020***	-5.592***	5.539						
	(-3.69)	(-2.68)	(1.66)						
Affiliated × Bond fund	0.354	-0.0617	-1.555**						
	(1.55)	(-0.28)	(-2.63)						
Affiliated × Equity fund	-0.434***	-0.294**	-0.431						
	(-3.30)	(-2.56)	(-1.63)						
Affiliated × Mixed fund	-0.339	-1.200***	-0.669						
	(-1.26)	(-4.01)	(-1.59)						
Capital ratio × Alternative fund				-0.211	-0.133	0.112			
				(-0.47)	(-0.29)	(0.28)			
Capital ratio × Bond fund				-0.384***	-0.291***	0.00314			
				(-4.53)	(-3.42)	(0.04)			
Capital ratio × Equity fund				0.00715	0.0859*	0.0503			
				(0.18)	(1.79)	(1.13)			
Capital ratio × Mixed fund				-0.369***	-0.322***	-0.00775			
				(-4.52)	(-4.00)	(-0.09)			
Capital ratio ×σ(Flows)					-0.0186***	-0.0132***			
					(-2.71)	(-3.05)			
CDS spread × Alternative fund							0.0228	0.0154	-0.0168
							(0.89)	(0.61)	(-0.88)
CDS spread × Bond fund							0.0220***	0.0145***	-0.00243
							(4.44)	(3.15)	(-1.02)
CDS spread × Equity fund							0.00141	-0.00337	0.000694
							(0.51)	(-1.11)	(0.48)
CDS spread × Mixed fund							0.00549	0.00110	-0.00279
							(0.97)	(0.20)	(-1.06)
CDS spread ×σ(Flows)								0.00156***	0.000371
								(3.37)	(1.52)
σ(Flows)	0.0510***	0.0515***	0.0340***	0.0979***	0.413***	0.294***	0.0587***	-0.0670**	0.00236
	(4.91)	(4.93)	(5.34)	(4.03)	(3.09)	(3.59)	(2.96)	(-2.17)	(0.13)
Fund controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month fixed effects	Yes	No	No	No	No	No	No	No	No
Month-peer group fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
N	438914	426378	425152	121052	121052	120552	128933	128933	128453
R^2	0.109	0.233	0.725	0.273	0.274	0.684	0.277	0.279	0.730

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of regressions (9) and (10) where the dependent variable is a fund's percent portfolio allocation to cash. Fund controls include the contemporaneous percent flows, the log of TNA, the log of fund age in months, the total expense ratio, the proportion of institutional ownership and the alpha over the previous six months. Month-peer group fixed effects represent a set of dummies for each combination of month and fund's asset type, Lipper Global classification scheme and geographical focus. The t-statistics reported in parentheses use standard errors clustered at the fund level and at the month level.

Table 8: The effect of the government and political crisis in Italy on fund flows.

	(1) 2m flows	(2) 2m flows	(3) X = *Bank CET1*	(4) X = *Bank LCR*	(5) X = *Italian parent*	(6) X = *Bank Exp.*$^{Ita\ sov}$
Fund Exp.$^{Ita\ sov}$	-0.797**	-0.888**	-0.679	-0.412	0.132	-0.270
	(-2.13)	(-2.31)	(-0.56)	(-0.63)	(0.45)	(-0.49)
Affiliated	-0.431**	-0.410**				
	(-2.14)	(-2.02)				
Affiliated × May '18	-0.0342	-0.108*				
	(-0.49)	(-1.68)				
Fund Exp.$^{Ita\ sov}$ × Affiliated	1.084**	1.088**				
	(2.42)	(2.48)				
Fund Exp.$^{Ita\ sov}$ × May '18	-2.262***	-2.082***	-6.498***	-1.738***	-0.937***	-1.697***
	(-14.11)	(-12.92)	(-5.99)	(-3.90)	(-5.18)	(-3.82)
Fund Exp.$^{Ita\ sov}$ × Affiliated × May '18	0.661***	1.168***				
	(4.06)	(6.67)				
Variable X			0.0560	-0.0465	0.876*	0.362*
			(1.21)	(-0.32)	(1.77)	(1.93)
Fund Exp.$^{Ita\ sov}$ × *Variable X*			0.0672	0.490	0.718	0.0996
			(0.85)	(1.43)	(0.98)	(0.32)
May '18 × *Variable X*			0.0510**	0.152*	-0.502**	-0.462***
			(2.52)	(1.84)	(-2.66)	(-4.67)
Fund Exp.$^{Ita\ sov}$ × May '18 × *Variable X*			0.439***	0.580***	0.606*	0.515*
			(5.73)	(3.34)	(1.95)	(1.83)
Fund controls	Yes	Yes	Yes	Yes	Yes	Yes
Month fixed effects	Yes	No	No	No	No	No
Month-peer group fixed effects	No	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	655094	639371	197353	133492	373873	152865
R^2	0.214	0.265	0.303	0.328	0.273	0.318
Sample	Full	Full	Affiliated	Affiliated	Affiliated	Non-Ita banks

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of different versions of regression (11) where the dependent variable represents cumulative percent fund flows for months t and $t+1$. The sample in columns (3)-(6) is restricted to bank-affiliated funds. In the estimation of column (6), funds with an Italian parent bank are excluded. Fund controls include 6-month alpha, Log(TNA), Log(Age), 2-month flows and institutional ownership, all lagged at time $t-1$, with the exception of the lag of 2-month flows which represents cumulative flows at time $t-2$ and $t-1$. Month-peer group fixed effects represent a set of dummies for each combination of month and fund's asset type, Lipper Global classification scheme and geographical focus. The t-statistics reported in parentheses use standard errors clustered at the fund level and at the month level.

Table 9: The effect of the Brexit referendum on fund flows.

	(1) 2m flows	(2) 2m flows	(3) 2m flows	(4) 2m flows	(5) *X = Low Cap.*	(6) *X = Low Liq.*	(7) *X = High CDS*	(8) *X = UK parent*
Fund Exp.^{UK}	-0.228	-0.141			-0.150	0.000959	-0.652	
	(-0.53)	(-0.37)			(-0.31)	(0.00)	(-1.32)	
Affiliated	-0.502**	-0.435**	-0.386	-0.524**				-0.274
	(-2.40)	(-2.16)	(-1.61)	(-2.23)				(-0.90)
Affiliated × June '16	-0.188**	-0.263***	-0.750***	-0.820***				-0.383***
	(-2.46)	(-3.58)	(-8.39)	(-8.77)				(-4.72)
Fund Exp.^{UK} × Affiliated	0.470	0.208						
	(0.88)	(0.40)						
Fund Exp.^{UK} × June '16	-2.622***	-1.016***			1.625**	1.842***	-0.464	
	(-9.80)	(-3.98)			(2.39)	(3.95)	(-1.33)	
Fund Exp.^{UK} × Affiliated × June '16	0.409	0.732***						
	(1.55)	(2.85)						
Fund Exp.$^{UKFin.}$			1.030	0.580				
			(1.21)	(0.77)				
Fund Exp.$^{UKFin.}$ × June '16			-8.065***	-5.807***				
			(-16.76)	(-15.10)				
Fund Exp.$^{UKFin.}$ × Affiliated			0.159	0.419				
			(0.15)	(0.44)				
Fund Exp.$^{UKFin.}$ × Affiliated × June '16			5.836***	6.656***				
			(8.51)	(9.49)				
Variable X					-0.421**	0.312	-0.777***	0.181
					(-2.58)	(1.45)	(-4.68)	(0.43)
Fund Exp.^{UK} × *Variable X*					1.500*	-0.370	1.296	
					(1.85)	(-0.35)	(1.62)	
June '16 × *Variable X*					-0.728***	0.0278	-0.494***	-1.276***
					(-5.53)	(0.26)	(-3.61)	(-7.94)
Fund Exp.^{UK} × June '16 × *Variable X*					-1.551***	-1.511**	-1.681**	
					(-2.89)	(-2.35)	(-2.35)	
Affiliated × June '16 × *Variable X*								-0.912***
								(-4.34)
Fund controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month fixed effects	Yes	No	Yes	No	No	No	No	No
Month-peer group fixed effects	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	568758	554084	346038	337635	194556	131696	189974	518834
R^2	0.209	0.262	0.223	0.267	0.301	0.328	0.296	0.266
Sample	Full	Full	Full	Full	Affiliated	Affiliated	Affiliated	Not UK-exposed

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table reports coefficient estimates of different versions of regression (12). The dependent variable represents cumulative percent fund flows for months t and t+1. All models exclude share classes denominated in GBP. The sample in columns (5)-(8) is restricted to bank-affiliated funds, and in column (8) funds with an exposure to UK assets higher than 20% are excluded. Fund controls include 6-month alpha, Log(TNA), Log(Age), 2-month flows and institutional ownership, all lagged at time $t-1$, with the exception of the lag of 2-month flows which represents cumulative flows at time $t-2$ and $t-1$. Month-peer group fixed effects represent a set of dummies for each combination of month and fund's asset type, Lipper Global classification scheme and geographical focus. The t-statistics reported in parentheses use standard errors clustered at the fund level and at the month level.