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Investors' behavior and mutual fund portfolio allocations during the financial crisis in Brazil

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Abstract

I examine the flow and performance of mutual funds in Brazil and their portfolio allocations during the 2008-2009 financial crisis. First, consistent with the empirical literature, I show the sensitivity of fund flows to past performance and the negative impact of large outflows on fund returns, using a large dataset of mutual funds with different investment strategies. Then, I show that mutual funds exposed to deposits and securities issued by small banks suffered significant outflows, due to concerns about the solvency of those banks after the Lehman's default in 2008. Returns of funds exposed to small banks were also negatively affected. Funds adjusted their portfolios by reducing the exposure to deposits of small banks, but when term deposit coverage limits were raised, funds increased risk taking. Our results illustrate the potential risks presented by asset management firms to the extent that interconnections with other financial institutions can induce the transmission of shocks across markets.

Keywords: Mutual fund flows; financial crisis; portfolio choice.
JEL Classification: G01, G11, G21, G23.

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1 Introduction

The asset management industry has grown considerably in advanced and emerging market economies over the last years[1]. The growth of assets under management by asset firms has also raised the concern about the potential risks that they present to financial stability. Mutual funds offer a diversified and liquid investment to retail and institutional investors as an alternative to bank deposits. Nonetheless, they are not guaranteed by a deposit insurance fund and due to liquidity mismatches they are subject to runs, especially those funds that offer daily liquidity and invest in less liquid assets.

In this paper, I study the run on some mutual funds during the financial crisis in Brazil. Following the default of Lehman Brothers on September 2008, small banks that had relied on wholesale funding were severely impacted by the increased risk aversion of institutional investors. They experienced a considerable outflow of term deposits while large banks that were perceived to be "too big to fail" increased their deposit balances (Oliveira et al., 2015). I study the impact of this negative liquidity shock on the mutual fund sector. I investigate whether the run on some funds can be explained by their holdings of deposits of banks affected by the financial crisis. Then, I study how mutual funds exposed to small banks changed their portfolio after the shock and whether the extended guarantee to new wholesale term deposits has altered the portfolio allocations of funds.

Unlike banks that are financed mostly by deposits and face liquidity and solvency risks, funds issue shares. Losses due to the collapse of an investment fund are born by investors. However, due to their size and interconnections to other financial institutions, mutual funds may play a role in the propagation of financial shocks. Channels of contagion[2] arise mainly by the role of mutual funds in funding banks through repurchase agreements, deposits or holdings of securities issued by financial institutions. Interconnections through bank funding are particularly important in the United States where MMFs are the largest provider of short-term funding to financial institutions (Kacperczyk and

[1] IMF (2015) presents a detailed assessment of the global asset management industry during the last decade.

[2] Other channels could arise through price contagion when funds' fire sales of certain illiquid assets exert downward price pressures in other asset markets (Manconi et al., 2012; Hau and Lai, 2017). Interconnections through ownership is another important source of risk since bank and insurance groups are the major owners of asset management firms. During the financial crisis, banks provided financial support to distressed entities with which they had a relationship to avoid the reputational risk that could affect their business, even though they did not have any contractual obligation to do so (Segura, 2018).

Schnabl, 2013).

I start the analysis by studying the drivers of fund flows. Previous studies have shown that flows are positively related to recent past performance (Chen et al., 2010; Ferreira et al., 2012; Lou, 2012; Goldstein et al., 2017). These studies also have shown that because investors invest in funds with strong past performance more intensely than they redeem shares of poorly performing funds, the shape of the relationship between fund flows and performance is convex.

Our analysis of the flow-performance relationship is motivated by the implications of investors behavior to financial stability since asset managers may take on risk to increase fund inflows. Second, there is a large literature examining flows of U.S. equity mutual funds, but there is little research on flows of bond/index funds or for countries other than the U.S.[3]. I aim to fill this gap by examining a large set of mutual funds from Brazil. The sample consists of more than 1,000 open-ended funds with different investment strategies, for retail and professional investors, over the period January 2007 to December 2016.

Consistent with the literature, I find that fund inflows are positively related to recent past performance. I show that past performance predicts inflows in funds for retail investors, but the results are not significant for professional investors. I also find that flows of funds for retail investors respond more intensely to simple returns adjusted to benchmark than more elaborate measures of return.

I further analyze the effect of large outflows on fund performance. Our interest in the impact of outflows on fund returns derives from the redemption risk that funds are exposed to since they offer to investors almost daily liquidity while investing in less liquid assets. This liquidity mismatch creates a first-mover advantage similar to the mechanism behind the Diamond and Dybvig (1983) model of bank runs. Such advantage is more pronounced in funds that invest in illiquid assets because of the cost of selling those assets. In liquid funds, such as short-term bond funds, I do not expect to see any significant damage to future fund performance due to large outflows.

I find that outflows of more than 10% of the total net assets (TNA) affected the returns of the funds in the following month. This effect is significant for equity funds and to a lesser degree for fixed

[3]Goldstein et al. (2017) study flows in U.S. corporate bond mutual funds and Ferreira et al. (2012) study flows in equity funds across 28 countries, which do not include Brazil.

income funds. I do not find a significant effect of large outflows on returns of funds for professional investors. These results confirm the hypothesis that illiquid funds are more affected by large outflows than funds that invest in liquid assets. Moreover, professional investors are less affected by the action of other investors because they hold a large fraction of the fund's TNA and, consequently, the negative externality imposed by withdrawals of other investors is weaker in professional oriented funds (Chen et al., 2010).

The previous results confirm the main stylized facts that emerge from studies of the flow-performance relationship such as the dependence of fund flows on past performance and the importance of other non–performance related variables like fund size and age to explain fund flows. To examine the effect of the small banks distress on mutual funds, I concentrate on the crisis period that starts with the default of Lehman Brothers and ends with the introduction of term deposits with an extended guarantee to institutional investors. I find that funds exposed to certificates of deposit and securities issued by these banks experienced larger outflows. Bearing in mind the differences in size and development of the mutual fund sectors, the origins of the run in Brazil are quite similar to two runs on Money Market Funds[4] (MMFs) that happened in the U.S.. The first one occurred following the default of Lehman when investors ran on MMFs due to concerns about their holdings of risky assets such as commercial papers issued by financial institutions[5]. The second episode occurred during the 2011 European sovereign debt crisis when investors ran on MMFs with large exposures to risky Eurozone banks (Chernenko and Sunderam, 2014).

To examine the extent to which fund returns were affected by their asset holdings, I compare the returns of funds with different exposures to small banks. I find that 1 percentage point (p.p.) increase in the fund exposure to small banks as the share of fund's total net assets leads to reduction in fund's excess return over benchmark by almost 0.60 p.p., which is economically significant.

In the midst of the 2007-2009 financial crisis, several countries – e.g. Australia, Germany, and

[4]MMF is a type of mutual fund that is required by regulation to invest exclusively in short-term, high rated debt securities.

[5]To stop the run and the contagion to other markets, the U.S. government announced an explicit deposit insurance covering all investments in MMFs made prior to Lehman's default and days later the Federal Reserve started to purchase commercial papers directly. Eventually, the blanket guarantee on investments and other measures stopped the run on MMFs, but at the cost of transferring the risk of US$3 trillion invested in MMFs to the government (Kacperczyk and Schnabl, 2010).

Ireland – introduced unlimited coverage on retail deposits while others – e.g. Austria, the Netherlands, and the U.S. – increased the coverage substantially (Allen et al., 2015). In Brazil, the Deposit Insurance Fund extended the guarantee to new term deposits of institutional investors. The extended deposit guarantee was effective in reducing deposit withdrawals from small banks, preventing bank failures that could have destabilized the financial system at that time. Hence, I study how fund portfolios changed after Lehman's default and increase of the deposit coverage limit. I find evidence that banks first reduced (increased) their holdings of certificates of deposit of small (large) banks and then increased (reduced) their exposure to small (large) banks after the deposit guarantee extension. This result is to some extent contrary to Strahan and Tanyeri (2015) that show the government guarantee of all U.S. money market investor claims did not lead to increased risk taking (measured by the sum of commercial paper and non-deposit-bank obligations as a percentage of assets) by fund managers.

Although there were anecdotal evidences of the run on funds with a more diversified portfolio (Mesquita and Torós, 2010) and that depositors ran on small banks after Lehman's default (Oliveira et al., 2015), this paper makes an important contribution by documenting the impact of the financial crisis on the mutual fund sector in Brazil. First, the results confirm the dependence of fund flows on past returns and the impact of large outflows on future performance. Both investors' behaviors have implications to financial stability since asset managers are encouraged to take on risk to increase fund flows and investors may run and amplify shocks due to the first-mover advantage. Second, my results offer a detailed analysis of fund flows and portfolio allocations during the financial crisis. I show that funds exposed to small banks suffered larger outflows when compared to non-exposed funds. Returns of funds exposed to small banks were also negatively affected. In addition, funds reduced risk taking (measured as the share of fund's total assets invested in certificates of deposit of small banks) after Lehman's default and increased risk taking after the extension of the deposit guarantee to wholesale term deposits.

To conclude, my results contribute to the literature on the consequences of Lehman's default across markets. Although I do not aim to assess whether financial intermediation through asset management firms makes the financial system more unstable, my findings suggest that as the banking system and the mutual funds become more interconnected, fund's asset holdings may become a key

transmission channel of shocks.

The organization of the paper is as follows. Section 2 describes the main regulations that apply to mutual funds in Brazil and how funds were affected by the financial crisis. Section 3 describes the data employed in the study. Section 4 presents the empirical methodology and Section 5 describes the main results. In Section 6 I carry out some robustness checks and Section 7 concludes.

2 Institutional background: The mutual fund sector

Brazil has the largest mutual fund sector among the emerging market economies, accounting for 3% of total assets under management[6] by funds as of 2014 (IMF, 2015). The growth of funds has been particularly pronounced during the past decade when assets under management by mutual funds have grown by 70%. Funds' assets reached R$3.4 trillions in December 2016, which represent 56% of the country's GDP or 163% of banking deposits. There are more than a thousand mutual funds available for investors, managed by an equally large number of asset management firms[7].

Asset managers play an important role in the operation of mutual funds. They are responsible for choosing fund's portfolio, trading of securities and managing risks in accordance to the fund's investment policy and regulations. Although end investors are the owners of the fund's assets in the proportion of the shares that they hold, investment decisions are delegated to asset managers, leaving investors with limited control over the fund's portfolio or risk taking. Asset managers are either an independent firm or a firm owned by a banking group. In Brazil, the mutual fund sector is dominated by asset management firms owned by banking groups. They manage the largest share of mutual funds' assets although the importance of independent firms is growing.

At the individual fund level, potential risks to the financial stability are limited since most of the funds are low-leveraged, "plain vanilla" investment products. Due to the high government interest rates, funds allocate 47% of their portfolios in government bonds, 25% in repurchase agreements with financial institutions, 13% in certificates of deposit or debt securities issued by financial institutions

[6] U.S. and Europe account for 49% and 31% of mutual funds' total assets, respectively.

[7] Statistics of Section 2 are based on *Anbima - Statistics of investment funds* (`http://www.anbima.com.br/pt_br/informar/estatisticas/fundos-de-investimento/fi-consolidado-historico.htm`)

and 8% in stocks (Figure 1), as of December 2016. Nonetheless, mutual funds are connected to the banking sector by various channels. Most of asset management firms are owned by banks and mutual funds are an important source of funding for the banking sector as well as revenue for banking groups.

2.1 The regulatory framework

The mutual fund sector is regulated and supervised by the Brazilian Securities and Exchange Commission (*Comissão de Valores Mobiliários – CVM*). To limit the potential risks for investors, the main regulation[8] that applies to publicly offered funds restricts fund holdings to a range of asset classes (e.g. equities, government bonds, corporate bonds, certificates of deposit, and foreign assets) and determines that a fund should be classified in one of the following fund categories in accordance to its investment style and portfolio: equity, fixed-income, balanced or asset allocation funds[9], or foreign exchange funds. Fixed-income funds invest primarily in government bonds, repurchase agreements and certificates of deposit or securities issued by financial institutions. This category includes both bond funds that invest exclusively in short-term government bonds or other low-risk debt securities, which make them similar to U.S. money market funds, and long-term, index-based funds that track a benchmark index. Equity funds should invest at least 67% of their assets in stocks. Balanced funds are generally actively managed funds that keep a diversified portfolio, investing in stocks, government and corporate bonds, derivatives, and other less liquid assets. Finally, foreign exchange funds are a category of funds that invest in assets where the main risk factor is due to changes in the currency exchange rates such as funds that track the U.S. dollar exchange rates. Figure 1 shows the total net assets (TNA) in each of the four categories of funds. The main categories are the fixed-income and balanced funds. They correspond to 67% and 27% of the TNA of the fund sector as of December 2016, respectively.

The use of derivatives and leverage is limited for all fund categories with the exception of balanced funds. In addition, regardless of fund category, mutual funds should follow rules regarding concentration of investments in a single issuer and in a single asset class. The limits per issuer

[8] *Instrução CVM nº 555, de 17 de Dezembro de 2014.*

[9] In Brazil, funds with a diversified portfolio of investments across various asset classes are known as multi-market funds.

establish that a fund may invest up to 20% of its assets in securities issued by a single financial institution, up to 10% in securities issued by a single publicly traded company, and up to 5% by other issuers. As a general rule, a fund may invest up to 20% of its total assets in each class of financial assets. Concentration limits per issuer and per asset class do not apply for investments in government bonds. Rules regarding the disclosure of information determine that investors should be informed about funds' portfolio holdings. Asset managers have up to 30 days to disclose detailed information about portfolio holdings for fixed-income funds and up to 90 days for other fund categories.

Mutual funds usually charges management and performance fees. Management fees were on average 1.02% for fixed-income funds and 2.07% for equity funds in December 2016. They can charge purchase and redemption fees although such fees are not common. Funds usually establish a time period after the investor places a redemption order to calculate the share price, which depends on the fund's net asset value of the day, and to pay investors for their shares. Investors pay income tax every six months (May and November) on interests received from government bonds and other debt securities or when they sell fund's shares. Income tax rates depend on the fund's underlying assets and investment term.

2.2 The financial crisis and the mutual fund sector

Brazil was not affected by the global financial crisis until the bankruptcy of Lehman in September 2008. Up to that date, Brazil as other emerging economies experienced a robust economic growth fueled by high commodity prices and good macroeconomic conditions. However, following Lehman's failure, the growth decelerated and the financial system was impacted by the increased risk aversion of market participants. Although Brazilian banks were not exposed to U.S. mortgage backed securities, the funding of small and medium-sized banks was affected by concerns about the liquidity and solvency of them. Their deposits decreased by almost 20% during the crisis and interbank lending was also reduced. On the other hand, large banks received an extra inflow of deposits. Oliveira et al. (2015) analyze the run on small banks' deposits and show it is explained by the depositors' perception of an implicit government guarantee of "too-big-to-fail" institutions and not by bank fundamentals. The authors also show that mutual funds reduced their holdings of certificates of deposit (CDs) issued

by small banks while increased CDs issued by large ones.

To restore the confidence on small financial institutions the Central Bank of Brazil and the Deposit Insurance Fund took a number of measures aimed at providing liquidity to banks and averting the risk of a systemic crisis. These measures included liquidity provisions in dollar using the foreign exchange reserves, updating of the regulation regarding the central bank's role as lender of last resort, and reduction of reserve requirements of large banks for purchases of assets of smaller institutions (Mesquita and Torós, 2010). Although these measures increased the liquidity of institutions, small banks were still suffering deposit outflows. So, in the end of March 2009, the Deposit Insurance Fund introduced a special term deposit with an extended guarantee of up to R$20 million. The increased coverage for new deposits had a great effect on small banks that were perceived as less solid by creditors and bank deposits started to grow again. These deposits with an extended guarantee became a significant source of funding for small banks and avoided bank failures that could destabilize the banking sector at that time.

The mutual fund sector was also affected by the financial crisis. Figure 2 shows the evolution of TNA of funds for retail and professional investors during the crisis. The net flow of funds for retail investors was negative in 2008 after five years of strong growth. TNA started to decline after May 2008 and presented a steeper decline in September 2008 whereas funds for professional investors[10] did not experience large outflows. This behavior is consistent with previous studies that show flows of funds for sophisticated investors are less sensitive to past performance or to market conditions (see e.g. Frazzini and Lamont, 2008 and Goldstein et al., 2017). However, Strahan and Tanyeri (2015) and Schmidt et al. (2016) found that immediately after Lehman's default, U.S. MMFs for retail investors experienced only minor redemptions when compared to funds for institutional investors.

The performance of funds was also negatively affected by the crisis. Large negative returns occurred in 2008, though in 2009 the mean excess return over benchmark was positive in almost every month and the standard deviation of excess returns decreased significantly (Figure 3).

[10]Professional investors are institutional investors such as pension and investment funds or investors with investments of more than R$1 million.

3 Data and summary statistics

I obtain the data from two sources: the *CVM* Open Data Portal and the Central Bank of Brazil. Fund-level data on the universe of active mutual funds is from *CVM*, which include TNA, share price, redemptions and number of investors. In conjunction with the register of all mutual funds it is possible to identify the fund's asset manager, fund category and other characteristics of the fund.

I also collect detailed information of fund asset holdings at year end from 2007 to 2009. Mutual fund must disclose their portfolio holdings with a delay of up to 90 days. The data contains information on financial assets, issuers and counterparties. Funds invest mainly in government bonds and repurchase agreements backed by government bonds. However, I focus on holdings of assets originated by financial institutions because the government debt market was not affected by the crisis. Among assets originated by the financial sector, funds invest mainly in certificates of deposit and bank debt securities.

The second source of information is the monthly balance sheet data of banks or banking groups provided by the central bank. The data is reported on a consolidated basis and I select all banking groups that manage funds through their asset management firms.

The monthly fund-level data and banks' balance sheet data cover the period from January 2007 to December 2016. I restrict the sample to publicly offered funds that are classified in one of the following *CVM* categories: equity, fixed-income or balanced funds. I exclude foreign exchange funds because this fund category represents less than 1% of the TNA of the fund sector. I also exclude from the analysis funds-of-funds, closed-end funds, funds set up exclusively to a single professional investor, and funds with less than R$10 million in assets.

To ensure that there are sufficient observations to calculate risk-adjusted performance measures, I exclude funds with less than 24 monthly observations. In December 2016, there were 1,479 mutual funds managed by 331 asset management firms in the final sample. Total net assets of these funds amount to R$2,178 billion, compared to R$3,217 billion of the initial sample.

To identify all asset management firms that are owned by banks, I proceed in two steps. First,

I identify asset managers that are part of banking groups using the list of all regulated financial institutions operating in the country provided by the Central Bank of Brazil. This method works for the majority of cases when the fund's manager is a regulated subsidiary of a bank such as a securities firm. However, if the fund's manager is an entity not regulated by the central bank, it can still be controlled by a bank. Based on the names of the asset manager and the fund's service provider or administrator[11], I identify an additional small set of asset management firms that are owned by banks. I compare manager and administrator names because banks usually use financial institutions that are part of their banking group – and are regulated by the central bank – to be the fund's administrator[12]. In the end, I identify 41 asset managers owned by banking groups managing 88.3% of the TNA of the sample as of December 2016. Asset management firms that I could not identify as part of a banking group by neither methods were classified as independent. I identify 290 independent asset managers responsible for 11.7% of the TNA of the sample.

Table 1 shows summary statistics of the mutual funds that belong to the three main fund categories (equity, fixed income and balanced funds). I partition the sample in funds for retail and for professional investors. The sample is from January 2007 to December 2016 and there are on average 1349 (s.d. = 327) funds in each month. Fixed income is the largest fund category with funds much larger than funds of other categories. Although equity funds are smaller than fixed income funds, they have the largest number of investor. The age of funds is approximately 5 to 7 years in the three fund categories. The average flow of funds ranges from 0.3% of the fund's TNA in balanced funds for retail investors to 3.98% of the fund's TNA in fixed income funds for professional investors. Fixed income funds have the higher mean raw returns. However, the average monthly returns of funds (not taking into account fund fees) are only slightly higher than benchmark rates in the three fund categories.

[11] Funds rely on service providers or administrators, either a subsidiary of a banking group or an independent institution, to carry out operational and administrative activities. In many cases, the asset manager and the administrator are the same financial institution.

[12] This method would not work if asset manager names were completely different from the names of their owners/administrators. However, it seems that asset manager names are chosen to closely reflect the underlying controller name. For instance, the asset manager "Credit Suisse Hedging-Griffo Wealth Management S.A." is not an institution regulated by the central bank and I am not able to identify the asset manager as bank-owned in the first step. The administrator of the family of funds is "Credit Suisse Hedging-Griffo Corretora de Valores S.A." which is a regulated securities firm part of the *Credit Suisse* banking group. Hence, based on the manager and the administrator names, this asset manager is classified as bank-owned in the second step.

4 Empirical methodology

4.1 Flows and fund performance

Many studies have shown that fund flows are highly dependent on past performance (see e.g. Ferreira et al. 2012). The dependence of flows on past performance is weaker for bond funds and stronger for equity funds (Goldstein et al., 2017). These studies also have shown that because investors invest in funds with strong past performance more intensely than they redeem shares of poorly performing funds, the relationship between fund flows and performance is non-linear. Huang et al. (2007) present a model to explain the asymmetric response of fund flows to past performance and the effect of several fund characteristics on the flow-performance relationship. The model relies on two main assumptions regarding investor behaviour: fund flows pursue past performance due to investors' Bayesian updating process, and investors face information cost of collection and analyzing information about funds and transaction cost of purchasing and redeeming fund shares. These costs can lead to differential responses of fund flows at different performance levels which explain variations in the flow-performance relationship in the cross-section of funds.

Hence, to investigate the flow-performance relationship, I calculate the net flow of a fund i as:

$$Flow_{it} = \frac{Inflow_{it} - Outflow_{it}}{TNA_{it}},$$

where $Inflow_{it}$ is the amount invested and $Outflow_{it}$ is the amount withdrawn from fund i, over the month t. TNA_{it} is the total net asset value of the fund at the end of month t[13]. I winsorize fund flows at the 1% level to reduce the influence of outliers in the results.

Previous studies have shown that other variables are important to explain fund flows besides past performance. I include variables to measure market conditions and fund characteristics such as

[13]It is standard in the literature to calculate the flow indirectly as $(TNA_{it} - TNA_{i,t-1}(1 + Ret_{it}))/TNA_{i,t-1}$, which measures the growth in TNA net of dividends and capital gains on assets under management. Since I have data on fund inflows and outflows, I could calculate the net flow directly.

size, age and number of investors and run the following regression:

$$Flow_{it} = \alpha + \beta_0 Perf_{i,t-1} + \beta_1 MarketVol_t + \gamma \mathbf{FundControl}_{it} + \varepsilon_{it}, \quad (1)$$

where $Perf_{i,t-1}$ is performance of fund i measured by either the excess return over benchmark or the Sharpe ratio[14]. The $MarketVol_t$ measures the market conditions in month t which may affect the flow of funds. $FundControl_{it}$ is a vector of variables of fund characteristics that affect the flow of funds as shown by previous literature. The coefficient of interest is β_0, which measures the sensitivity of fund flows to past performance. I expect the coefficient to be positive if past performance attracts flows into the fund after controlling for market conditions and fund characteristics.

I test three variables to measure the global and the local market conditions: the VIX[15], which is usually used as measure of global risk aversion; the JP Morgan Emerging Markets Bond Index (EMBI) for Brazil that measures the spread of sovereign debt over US treasuries; and the monthly variance of the Brazilian real-dollar exchange rate. In addition, I include a dummy variable for the crisis period ($Crisis_t$), equal to one from September 2008 to March 2009, and zero otherwise. In the vector of fund control variables, I include the size of the fund ($Size_{it}$) in log of its total net assets (TNA), fund age (Age_{it}) in years since the fund's inception, and log of the number of investors in the fund ($NumInv_{it}$). To control for asset manager characteristics, I include the log of manager's total assets under management. I also include interaction variables of the fund size and fund age with the performance measure.

Funds are subject to redemption risk because they offer daily liquidity while investing in less liquid assets. After large outflows, funds need to conduct costly trades to adjust their portfolio. First, asset managers can use cash buffers or sell more liquid assets. Then, managers sell less liquid assets possible at a discount, which may damage future returns. If the transaction costs are born by the remaining investors, the incentive for each individual investor to stay in the fund is reduced (Chen

[14]The common benchmark rate used for fixed income and balanced funds is the Brazilian interbank deposit rate known as *CDI* and for equity funds is the *Ibovespa*, which is the leading indicator of Brazilian stocks listed on the *BM&FBovespa*. The Sharpe ratio is the risk-adjusted performance measure given by: $(\bar{r}_{it} - r_{ft})/\sigma_{it}$, where $\bar{r}_{it}$ is the mean fund's return, r_{ft} is the risk-free return rate and σ_{it} is standard deviation of the fund's return. Means and standard deviavitions were computed using a 12 months window.

[15]Chicago Board Options Exchange Market Volatility Index.

et al., 2010).

Therefore, to investigate whether large outflows damage future fund returns, the following model is estimated:

$$Perf_{it} = \alpha + \beta_0 Outflow_{i,t-1} + \sum_{j=1}^{j=6} \beta_j Perf_{i,t-j} + \beta_7 MarketVol_t + \gamma \mathbf{FundControl}_{it} + \varepsilon_{it}, \tag{2}$$

where $Perf_{it}$ is alternatively the excess return over benchmark or the Sharpe ratio. As in Chen et al. (2010), $Outflow$ is an indicator variable equal to one if the net flow is lower than -10% of the fund's TNA. I include the lags of returns up to six months in the regression to control for past fund returns. Our coefficient of interest is β_0, which measures the impact of large outflows on future fund returns. I expect the coefficient to be positive if large outflow affects future fund returns after controlling for past returns and fund characteristics.

4.2 Mutual funds and the banking sector during the financial crisis

The financial crisis was an extreme event and so, I expect to observe a completely different interaction between asset managers and investors during that time. Therefore, the analysis of the large sample that consists mostly of calm periods may reduce the ability to explain the run on some funds. For this reason, I focus on the period from January 2008 to March 2009, which includes the exogenous liquidity shock on small banks caused by Lehman's default and ends with the introduction of term deposits with a special guarantee in March 2009. The guarantee of the deposit insurance fund for large term deposits of institutional investors contributed to stop the outflow of deposits from small banks.

Our main objective is to explain the run on some funds during the crisis. The outflow of those funds may be explained by recent past performances or by their asset holdings. Investors could have run on funds with low returns or because they were concerned about investments of funds in certificates of deposit or other securities issued by banks that were affected by the liquidity crisis

following the Lehman's default. Investors have data on past fund returns, but they usually do not have accurate and timely data on the composition of a fund's portfolio. However, investors can infer the fund's asset holdings from past portfolio disclosures which contain detailed information on the composition of the portfolio, issuers and counterparties of financial assets and are published with a delay of up to 90 days.

Fund flows and returns may be endogenously related to fund asset holdings. To solve this endogeneity problem and answer whether the run on funds is explained by their underlying assets, I use the financial crisis as a negative liquidity shock that affected mainly small banks. There is no evidence that the shock was anticipated by asset managers when they invested in certificates of deposit or securities issued by small financial institutions prior to Lehman's default. As a result, funds with a larger amount of financial assets originated by small banks are expected to be more affected by the shock. This makes holdings of small banks' assets a good proxy to measure the individual fund's exposure to the increased risk aversion of market participants.

Hence, to study the effect of the shock on the mutual fund sector, I proceed in the following ways: First, I show the effect of holdings of deposits and obligations of small banks on the flow of funds. I expect that funds with more assets originated by small banks in their portfolios will experience larger redemptions since those assets were considered risky during the crisis. Second, I study whether holdings of small banks' assets affect the performance of funds. I expect that returns of funds with a higher exposure to small banks will be lower because asset managers had to conduct costly trades to adjust fund's portfolio and reduce risk exposures. Finally, I focus on how funds reallocated their portfolio holdings of risky assets to face outflows. I expect to see a reduction in certificates of deposit of small banks following Lehman's default and an increase after the change in the deposit coverage limit.

To study the effect of small banks' asset holdings on the flow of funds following Lehman's default, I apply a Difference-in-Differences (DiD) estimation in which $RiskyAssets_i$ is a treatment variable. More specifically, I estimate the following regression model:

$$Flow_{it} = \beta_0 Crisis_t + \beta_1 Crisis_t \times RiskyAssets_i + \gamma \mathbf{FundControl}_{it} + \nu_i + \varepsilon_{it}, \tag{3}$$

where $Flow_{it}$ is the net flow into fund i in month t. $Crisis_t$ is an indicator variable equal to one for the post crisis period (September 2008 to March 2009) and zero for the pre crisis period (January to August 2008). It controls for any time effects common to all funds independently of their exposure to the shock. $RiskyAssets_i$ is used to measure fund i's exposure to small banks in December 2007. The variable controls for differences between funds with different levels of exposure to small banks. I am interested in the coefficient β_1 of the interaction between $Crisis_t$ and $RiskyAssets_i$. It gives the average DiD effect that measures the difference in the average fund flows after the shock for funds with different levels of exposure to small banks.

The variable $RiskyAssets_i$ is calculated as the fraction of fund total assets invested in certificates of deposit and other securities issued by small banks before the crisis. I opt for a continuous treatment variable to compare the effect of a change in the level of exposure to small banks. I also test a binary variable equal to one if the fund has invested in assets of small banks. $FundControl_{it}$ is a vector of fund variables that includes fund's asset size, fund age, number of investors in the fund and the size of manager's assets under management. I also include fund returns because fund flows is expected to be correlated to the performance of the fund. I add fund fixed effects represented by ν_i to account for time invariant fund-specific influences.

Instead of estimating Equation (3) using monthly data, I collapse the data and take the average of the pre- and post-shock periods. This procedure has the advantage of smoothing out variation and it produces consistent standard errors (Bertrand et al., 2004). Besides, the validity of the identification strategy rests on the assumption of parallel trends between treatment and control groups. That is, trends in flows of funds exposed to assets originated by small banks and of funds not exposed to these assets would be the same in the absence of the shock. In Section 6 I report the results of a number of robustness tests aim at assessing the validity of the research design. I show that the differences in pre-crisis levels and trends of the two fund groups are not statistically significant.

To study whether the performance of the funds were affected by their holdings of assets of small banks, I again use a DiD estimation similar to Equation 3:

$$Perf_{it} = \beta_0 Crisis_t + \beta_1 Crisis_t \times RiskyAssets_i + \gamma \mathbf{FundControl}_{it} + \nu_i + \varepsilon_{it}, \tag{4}$$

where the dependent variable $Perf_{it}$ is the excess return over benchmark, $Crisis_t$ is an indicator variable for the crisis period, and $RiskyAssets_i$ measures the exposure of fund i to assets originated by small banks. Fund control variables are similar to those in Equation 3. The coefficient of interest is β_1, which measures how the returns of funds more exposed to small banks were affected by the crisis.

Finally, I investigate how funds adjusted their portfolios in response to Lehman's default and later to the introduction of term deposits with an extended guarantee. The liquidity problems faced by small banks altered significantly the risk-taking incentives of asset managers. On the other hand, the extended guarantee on term deposits was effective in restoring the confidence of institutional investors in small banks and their deposits started to grow again.

Hence, to study how funds adjusted their holdings of risky assets, I extend the analysis to include data for the period after the increase of the deposit coverage limit. I only have detailed fund portfolio data for December of the years 2007 to 2009. Due to these data constraints, the dependent variable (fraction of risky assets) and explanatory variables are measured by year end observations from 2007 to 2009. I then estimate the following regression model:

$$RiskyAssets_{it} = \beta_0 Crisis_t + \beta_1 ExtCoverage_t + \gamma \mathbf{FundControl}_{it} + \nu_i + \varepsilon_{it}, \tag{5}$$

where the dependent variable ($RiskyAssets_{it}$) measures the fraction of fund's TNA invested in certificates of deposit of small banks. I include $Crisis_t$, which is an indicator variable equal to one for the periods after Lehman's default (i.e. 2008 and 2009) and zero otherwise, and $ExtCoverage_t$, which is an indicator variable equal to one for the period after the extension of guarantees to wholesale term deposits (2009) and zero otherwise. The vector of control variables is measured as before. I add fund fixed effects to account for unobserved, time-invariant fund characteristics. I expect to see a reduction in the fraction of risky assets in the portfolio of funds during the crisis and then an increase in risk taking because of the deposit guarantee extension.

To check the robustness of the results, I also run a regression including in Equation (5) fund flows and the dummy variables interacted with flows to reflect the differential effect of flows on the share of risky assets during the post-Lehman periods. To deal with the potential endogeneity of fund

flows and risky assets, I estimate it by two-stage least square (2SLS) using lagged values of fund returns as instruments. The intuition is that returns are strongly correlated with fund flows as previous results have shown but should not otherwise affect the share of risky assets in fund's portfolio.

5 Results

In this section, I describe the main empirical results. First, I study the drivers of fund flows and the performance of funds after large outflows using monthly observations from January 2007 to December 2016. I am particularly interested in the effect of fund returns on flows which may encourage excessive risk taking by asset managers and the existence of a first-mover advantage which may motivate investor to run. Next, using a reduced sample, I investigate the behavior of mutual funds during the financial crisis. Our main interests are in the flow and performance of funds exposed to small banks through portfolio holdings and how funds reallocate their investments following Lehman's default and the increase in term deposit coverage limits.

5.1 The flow-performance relationship

I start the analysis showing how the flow of funds is affected by recent past performance. In Table 2, I show the coefficients of Equation (1) estimated by pooled OLS and including fund fixed effects, for the subsample of retail funds in the three fund categories (equity, fixed-income and balanced funds). In Table 3, I show the results for the subsample of funds for professional investors.

Columns (1), (5) and (9) of Table 2 show that an increase in fund returns in excess to benchmark has a significant effect on fund flows. Balanced funds exhibit stronger sensitivity of flows to past performance than the other fund categories. For example, one percentage point increase in lagged average excess return would increase subsequent fund flows by approximately 0.14%, 0.61% and 0.73% in equity, fixed income and balanced funds, respectively. In Columns (2), (6) and (10), I estimate the model with fund fixed effects to account for unobserved, time-invariant factors affecting fund flows as in Gil-Bazo and Ruiz-Verdú (2009). Standard errors are adjusted for heteroskedasticity and clustered

at the fund level. The coefficients are slightly lower but statistically significant, confirming the sensitivity of fund flows to past performance. Fund flows within the same asset management firm may be correlated across its funds. To address this concern, I also clustered standard errors at the asset manager level but both regressions produce similar results (not shown).

In Columns (3-4), (7-8) and (11-12) of Table 2, the dependent variable that measures the performance of the fund is the Sharpe ratio. We see that responses of fund flows to this performance measure are not significant. The results are consistent with the previous literature on the flow-performance relationship which shows that investors respond more strongly to simple adjusted returns to benchmark than to more refined measures of performance (Chen et al., 2010).

In the regressions, I tested three different variables to control for market conditions. The variance of the dollar exchange rate and the VIX produced similar results while the *Embi* was not significant in most regressions. I opt to present only the results using the VIX variable. The indicator variable $Crisis_t$, which also accounts for the change in market conditions during the financial crisis, has a negative and significant effect on fund flows in all regressions. I find that the size of the fund has a positive while the age has a negative effect on fund flows. I also find that the coefficients of the interaction of fund returns with fund age are negative and statistically significant. This result is consistent with Berk and Green (2004) model, in which investors have more information about the fund's performance as the age of the fund increases and, consequently, flows respond less to past returns.

Table 3 presents the results of the regressions examining the flow-performance relationship of funds for professional investors. Consistent with prior literature, we see that professional investors are less responsive to past performance than retail investors. The excess return over benchmark is statistically significant only for the subsample of equity funds. The coefficients of the performance measure calculated by the Sharpe ratio are not significant in all fund categories.

In Table 4 I investigate if large outflows damage future fund performance. I estimate Equation (2) by pooled OLS on subsamples partitioned by fund category and investor base[16]. In the previous regressions, I find that flows respond more to simple adjusted returns and so, the excess return over benchmark is used as the fund's performance measure. The results for retail oriented funds are pre-

[16]I do not estimate Equation 2 with fund fixed effect because it would be correlated with the lagged dependent variable.

sented in Columns (1) to (3). I find that large outflows in the past month predict lower returns in the current month after controlling for past returns. The effect is significant for the three fund categories, but the magnitude of the estimates are different. The results of funds for professional investors are presented in Columns (4) to (6). Large outflows do not have a significant effect on future returns of those funds.

Chen et al. (2010) show that large outflows damage future fund performance in illiquid funds more than in liquid ones. This pattern disappears in funds where the investor base is composed mostly of large investors. The illiquidity of the underlying assets could explain the higher negative effect of large outflows on future returns of equity funds compared to fixed-income funds that invest mainly in government bonds and repo transactions. However, I could not test this hypothesis because I do not have detailed data to calculated the liquidity of the underlying assets. Yet the insignificant coefficients on large outflows in funds for professional investors are consistent with Chen et al. (2010) findings.

5.2 The run on mutual funds during the financial crisis

The banking sector and especially small banks were affected by the negative liquidity shock following the default of Lehman. This section studies the impact of this shock on flows, returns and portfolio holdings of mutual funds. I focus on funds for retail investors and consider only fixed income and balanced funds since equity funds have a negligible exposure to deposits or debt securities issued by banks.

I first analyze the flow of funds that have invested in risky assets during the financial crisis (Equation (3)). I use a continuous variable ($RiskyAssets_i$) to measure the fraction of fund's TNA invested in assets of small banks. To address the concern that the results might be driven by unobserved, time-invariant differences among funds that are correlated with their exposure to small banks, I estimate the equation with fund fixed effects. In Columns (1) to (4) of Table 5, I show the results for the sample of all funds. Column (1) reports simple DiD estimates which yield large negative effects on the flow of funds. In Column (2), the regression model is extended by including control variables for the fund characteristics that may affect the outcome of interest such as fund age and fund returns. The

results also imply a substantial impact on the flow of funds exposed to assets of small banks compared to other funds. Specifically, in the sample, one percentage point increase in the fraction of fund's TNA invested in risky assets as certificates of deposit of small banks leads to a reduction of fund flows in the order of 0.10 p.p.. Columns (3) and (4) replace the continuous variable with an indicator variable ($DumRiskyAssets_i$) equal to one for funds that have invested in assets of small banks. The estimated coefficients are smaller but still significant and they confirm that investors reduced their exposure to exposed funds. These findings indicate strong support for the hypothesis that investors flew from funds exposed to small banks due to concerns on the solvency of those banks.

The inclusion of control variables such as fund age, size, and past performance influences the estimate of the DiD effect only slightly, which is an indication that the DiD strategy is sound, since sorting of funds across treatment and control groups is not predicted by observables.

Columns (5) to (8) of Table 5 show the results for the subsample of funds that invest in assets of banks. As expected, the coefficients on β_1 are statistically significant and moderately higher than the coefficients estimated for the full sample. The preferred estimate of the coefficients, using the continuous treatment variable and control variables for fund characteristics – Column (6) – implies that on average a fund with a 1 percentage point increase in its exposure to small banks decreased its net flow by approximately 0.30 p.p. of the fund's total net assets.

Next, I study whether the performance of the funds were affected by their holdings of assets of small banks (Equation (4)). In Columns (1) and (2) of Table 6, I estimate the impact of the shock on the returns of funds with different levels of exposure to small banks. I include fund fixed effects to account for unobserved, time-invariant fund characteristics. The vector of fund characteristics controls for differences in observable characteristics between the treatment and control groups in both periods. The results indicate that for fixed income funds 1 percentage point increase in the fraction of holdings of small bank deposits leads to a decrease in the fund's excess return over benchmark by nearly 0.59 p.p., which is economically and statistically significant. In Columns (3) and (4), I use an indicator variable equal to one for funds exposed to small banks. The results also show that the returns of funds exposed to those banks were negatively affected by the shock.

In Columns (5) to (8) of Table 6, I repeat the same exercise only for funds that invest in assets originated by banks. I find that funds exposed to small banks have significantly lower yields in the post shock period relative to other funds. Our findings support the interpretation of the causal relationship between the exposure of funds to small banks and the reduction in their yields.

In the previous regressions, I document the significant decrease in flows of funds exposed to small banks and the reduction in fund yields. Funds that took more risks before Lehman's default, compared to funds that had invested in safe assets such as government bonds for example, experienced larger redemptions. In Equation (5), I study how funds adjusted their portfolios in response to outflows during the time period that includes the Lehman's default shock and the increase in the deposit coverage limits. Due to constraint in fund portfolio data, I estimate a three-year panel data set with dependent and explanatory variables measured at the end of years 2007 to 2009.

I report the results in Table 7. In Column (1), I regress the share of fund's TNA invested in certificates of deposit of small banks on fund flows, time dummies for the periods after the Lehman's default ($Crisis_t$) and after the extension of deposit guarantee to term deposits ($ExtGuarantee_t$), and interactions of these variables with fund flows. I also include a vector of fund control variables. To deal with the endogeneity of fund flows, I estimate Equation (5) by 2SLS using lagged fund returns as instruments. We see a reduction in the average share of deposits of small banks in December 2008 and an increase in December 2009. In Column (2), I estimate the equation without fund flows and the interactions of this variable with time dummies to check whether the results differ from 2SLS estimates. It is possible to see that the coefficients on $Crisis_t$ and $ExtGuarantee_t$ are practically the same and the coefficients on fund flows are not statistically significant. In Columns (3) and (4), I repeat the same exercise for the subsample of funds that invest in bank deposits. As expected, I find an even large negative effect of the crisis on the average share of fund's assets invested in deposits of small banks. Although the effect of fund flows is not significant, I find that the coefficient on flows interacted with extended deposit guarantee period is negative and statistically significant. Funds reduced their investments in deposits of small banks when faced with outflows.

Considering that the dependent variable is censored at zero, I check the robustness of my findings using for estimation a random effects Tobit regression. Column (9) shows the results for the

sample of all funds. I also find that the coefficient for $Crisis_t$ is negative and significant while the coefficient for $ExtGuarantee_t$ is positive, consistent with the prediction that funds reduced their average exposure to risky assets and increased their exposure afterwards.

In Columns (5) to (8) I estimate the same regression but changing the dependent variable to the share of fund's TNA invested in certificates of deposit of large banks. Since large banks were not affected by the liquidity shock, the aim is to check whether asset managers reallocated their investments to deposits in safer banks during the crisis. The coefficients of $Crisis_t$ and $ExtGuarantee_t$ are positive and negative, respectively, and statistically significant. The signals of the coefficients are contrary to the ones observed when using the share of deposits of small banks as the dependent variable. I find that funds increased the average share of deposits of large banks during the crisis and then reduced their investments in deposits of those banks after the extension of deposit guarantees. In Column (10), the results of the estimation of a random effects Tobit regression for the sample of all funds confirm my previous results. In conclusion, the results of Table 7 confirm that funds increased their holding of safe certificates of deposit of large banks during the crisis and move toward insured deposits of small banks after the extension of the deposit guarantee.

6 Robustness checks

The consistency of the DiD estimator rests on the "parallel trend" assumption, which means that in the absence of treatment, the average change in the dependent variable would have been the same for both the treatment and control groups. Although this assumption is not testable, I present the results of tests to check the validity of my research design.

Table 8 provides *p*-values for tests of the null hypothesis that mean pre Lehman's default shock levels (Panel A) and trends (Panel B) are equal across funds not exposed to small banks and funds exposed to those banks. Column (4) shows that the differences between the mean flows and mean returns of funds in the two groups in June 2008 are not statistically different from zero. The only minor difference is in the mean fund age. Funds exposed to small banks are older than not exposed funds. Moreover, panel B of Table 8 indicates that trends over the December 2007 to June 2008 period

are similar between the two groups. The results show that there are not significant differences in the levels of variables among funds exposed or not to small banks and the treatment and control groups were on parallel trends in the pre-period.

The assumption of the methodology is that funds holding a larger fraction of assets originated by small banks were affected more severely by the shock because those banks were perceived as risky by investors. The effect of fund's portfolio holdings on fund flows should be insignificant if I repeat the same experiment on pre-crisis years. Therefore, I falsely assume that the onset of crisis occurred in December 2007.

As reported in Columns (1) to (4) of Table 9, the effect of holdings of small bank deposits and securities on fund flows – the β_1 coefficient that measures the average DiD effect – is statistically indistinguishable from zero for the samples of either all funds and funds that invest in assets of banks. In Columns (5) to (8), the dependent variable is fund's excess return over benchmark. I also find that the coefficients of the interaction terms that give the average DiD effect are not statistically significant. These results confirm that the observed changes in fund flows and returns are more likely due to the risk aversion of investors following Lehman's default than other possible explanations.

7 Conclusion

This paper studies investors' behavior and mutual fund portfolio allocations during the financial crisis in Brazil. Following Lehman's default, small banks that had relied on institutional investors as funding providers were severely impacted by the increased risk aversion of market participants. I find that outflows were especially pronounced among funds for retail investors that invested in deposits and other assets of those banks. The result indicates that interconnectedness through holdings of bank assets played a role in the transmission of these negative liquidity shock to the mutual fund sector. I further show that funds responded to outflows by reducing their exposures to risky assets. However, when the deposit insurance fund extended the guarantee to wholesale term deposits, funds increased their exposure to those banks.

Although I present evidence that investors ran on funds exposed to assets of small banks and asset managers reallocated their portfolios away from risky banks, it is important to note that the run did not threaten the stability of the banking system. Differently from the U.S., where the government had to intervene in the money market funds to stop the run by providing unlimited guarantee to all fund investors, the level of financial intermediation through asset management firms in Brazil is still low since most of mutual funds invest in government bonds that were not affected by the crisis. However, in a prolonged period of low interest rates as experienced by advanced economies, asset managers may be encouraged to take more risks to increase their revenues given of the sensitivity of fund flows to past performance. As a result, fund managers could reduce market discipline on financial institutions and make the banking system more unstable.

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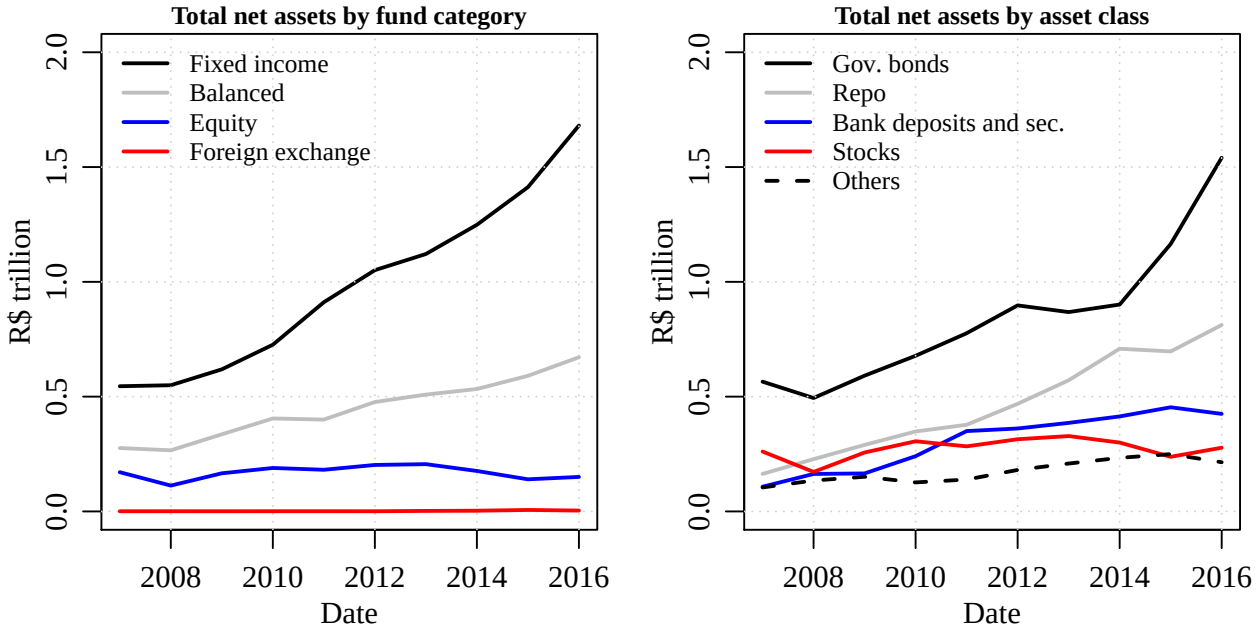

Figure 1: *Total net assets (TNA) of mutual funds by fund category (left) and by underlying asset (right), from 2007 to 2016.*

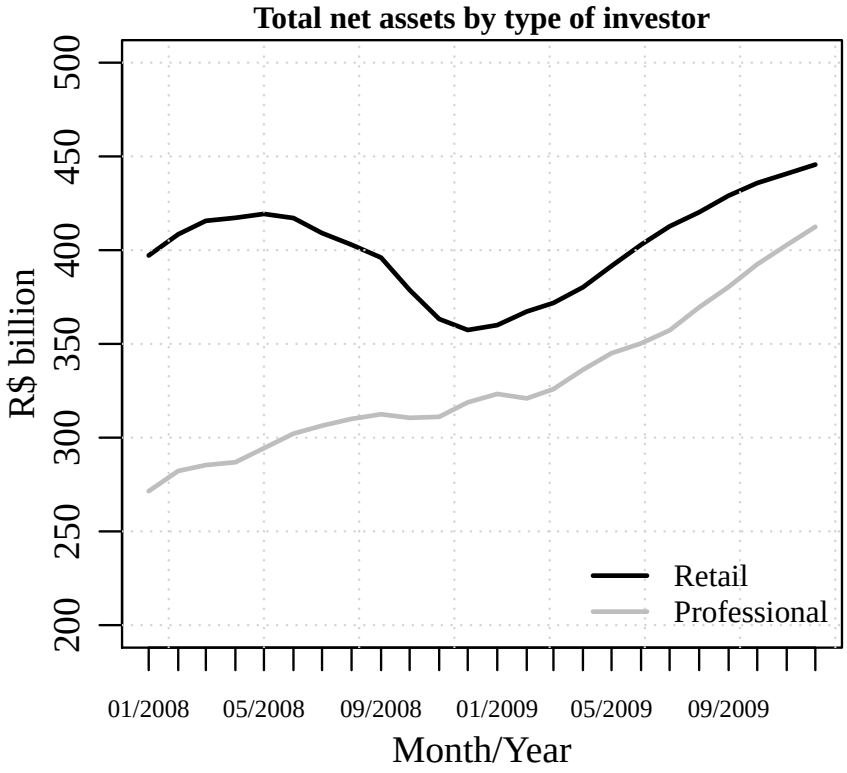

Figure 2: *Total net assets (TNA) of mutual funds for retail and professional investors, from January 2008 to December 2009.*

Figure 3: *Mean fund excess returns over benchmark (left) and standard deviation of excess returns (right) of mutual funds for retail and professional investors, from January 2008 to December 2009.*

Table 1: Summary statistics of the sample of mutual funds.
The table presents mean, median, 25% and 75% quartiles, and standard deviation of fund variables within each fund category (equity, fixed-income and balanced funds) of funds for retail and professional investors, from January 2007 to December 2016. The sample is restricted to open-end funds, funds with a minimum of 24 continuous monthly observations of returns, and funds with more than R$10 million in assets.

	Retail-oriented funds					Professional-oriented funds				
	Mean	Median	25%	75%	St. Dev.	Mean	Median	25%	75%	St. Dev.
Equity funds										
Size (R$ million)	140.9	60.4	25.9	156.0	223.9	149.5	44.5	21.1	121.6	318.6
Flow (% of TNA)	0.12	-0.74	-2.40	0.48	12.18	0.96	0.00	-0.05	0.00	33.26
Return Raw(%)	0.53	0.48	-3.13	4.13	6.66	0.64	0.71	-2.36	3.57	10.69
Return Excess (p.p.)	0.43	0.30	-1.31	2.30	4.30	0.58	0.43	-1.46	2.67	10.03
Age (years)	6.60	5.13	2.58	9.61	5.34	4.54	3.56	1.88	6.17	3.70
Num. of investors	3,140	38	3	635	11,492	16	3	1	7	57
Fixed income funds										
Size (R$ million)	1,547.9	222.4	75.4	880.0	4,979.8	959.1	170.5	67.9	480.8	4,419.4
Flow (% of TNA)	1.96	-0.16	-3.51	3.26	67.86	3.98	0.00	-1.70	1.37	148.95
Return Raw (%)	0.91	0.86	0.71	1.04	7.17	0.89	0.89	0.73	1.08	1.37
Return Excess (p.p.)	0.04	0.00	-0.04	0.04	7.17	0.02	0.01	-0.02	0.08	1.36
Age (years)	7.17	5.89	2.78	10.78	5.32	5.56	4.50	2.14	8.02	4.28
Num. of investors	423	25	6	152	2,143	16	2	1	10	108
Balanced funds										
Size (R$ million)	246.2	66.0	28.9	192.9	778.0	167.8	43.4	21.4	109.7	513.0
Flow (% of TNA)	0.03	-0.75	-4.42	1.48	19.20	0.83	0.00	-0.99	0.00	31.93
Return Raw (%)	0.88	0.87	0.51	1.26	2.12	0.86	0.88	0.58	1.19	3.16
Return Excess (p.p.)	0.02	0.02	-0.30	0.38	2.11	0.00	0.02	-0.21	0.29	3.16
Age (years)	5.29	4.16	2.11	7.28	4.18	5.06	4.05	1.98	7.30	3.94
Num. of investors	330	11	2	152	1,204	9	2	1	4	69

Table 2: The flow-performance relationship of funds for retail investors.

*The table presents the results of regressions examining the flow-performance relationship of funds for retail investors from January 2007 to December 2016. The sample is partitioned by fund categories (equity, fixed-income and balanced funds). The dependent variable is the net flow to fund i in month t ($Flow_{it}$). The explanatory variables are the performance of the fund, measured by the return over the benchmark ($ReturnExcess_{it}$) or the Sharpe ratio ($SharpeRatio_{it}$), and variables to control for fund characteristics. The coefficients in Columns (1),(3),(5),(7),(9) and (11) are estimated by pooled OLS. The coefficients in Columns (2),(4),(6),(8),(10) and (12) are estimated including fund fixed effects. The table reports robust standard errors (in parentheses), clustered at the fund level. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

Fund category	Equity				Fixed income				Balanced			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$ReturnExcess_{t-1}$	0.141***	0.123***			0.611***	0.557*			0.732***	0.776***		
	(0.027)	(0.038)			(0.141)	(0.313)			(0.118)	(0.154)		
$SharpeRatio_{t-1}$			0.321	0.222			-0.016	-0.018			0.035	0.009
			(0.263)	(0.239)			(0.029)	(0.028)			(0.047)	(0.043)
VIX_t	0.022***	-0.058***	0.032***	-0.019	0.021	0.021	0.040**	0.045**	-0.067***	-0.123***	-0.061***	-0.100***
	(0.008)	(0.012)	(0.010)	(0.014)	(0.013)	(0.015)	(0.016)	(0.018)	(0.014)	(0.019)	(0.018)	(0.020)
$Crisis_t$	-2.161***	-1.166***	-2.216***	-1.519***	-1.173**	-1.130**	-1.689***	-1.804***	-2.547***	-1.717**	-2.340***	-1.681**
	(0.304)	(0.337)	(0.336)	(0.364)	(0.484)	(0.558)	(0.562)	(0.588)	(0.515)	(0.699)	(0.602)	(0.780)
$\log FundSize_t$	0.313***	1.029***	0.204***	0.708*	0.616***	3.036***	0.648***	3.504***	0.483***	2.727***	0.408***	2.299***
	(0.041)	(0.291)	(0.056)	(0.404)	(0.045)	(0.350)	(0.061)	(0.456)	(0.054)	(0.369)	(0.070)	(0.450)
Age_t	-0.121***	-0.763***	-0.125***	-0.725***	-0.209***	-0.390***	-0.218***	-0.453***	-0.240***	-0.711***	-0.274***	-0.757***
	(0.011)	(0.068)	(0.014)	(0.101)	(0.014)	(0.065)	(0.019)	(0.085)	(0.017)	(0.084)	(0.023)	(0.120)
$\log NumInv_t$	0.112***	-1.372***	0.034	-1.246***	0.128***	-2.093***	0.070	-2.564***	-0.003	-1.623***	0.009	-2.029***
	(0.018)	(0.317)	(0.022)	(0.396)	(0.033)	(0.323)	(0.045)	(0.430)	(0.033)	(0.389)	(0.045)	(0.437)
$\log ManagerSize_t$	-0.077***	0.331	-0.059**	0.382	-0.071**	0.069	-0.080	0.314	-0.091***	-0.733*	-0.032	-1.337**
	(0.018)	(0.256)	(0.024)	(0.336)	(0.036)	(0.386)	(0.049)	(0.462)	(0.029)	(0.416)	(0.038)	(0.549)
$Ret \times FundSize_t$	0.008	0.019			0.528***	0.534**			-0.018	-0.014		
	(0.032)	(0.031)			(0.074)	(0.226)			(0.019)	(0.052)		
$Ret \times Age_t$	-0.008***	-0.007**			-0.075***	-0.068*			-0.029**	-0.040**		
	(0.002)	(0.003)			(0.017)	(0.038)			(0.014)	(0.016)		
$SR \times FundSize_t$			-1.282***	-1.515***			0.014*	0.012*			0.049	0.033
			(0.363)	(0.443)			(0.008)	(0.007)			(0.036)	(0.039)
$SR \times Age_t$			-0.018	-0.003			0.001	0.001*			-0.008	-0.002
			(0.022)	(0.020)			(0.000)	(0.001)			(0.011)	(0.010)
Constant	-4.611***	-13.146*	-2.853***	-10.114	-10.287***	-50.780***	-10.756***	-63.812***	-5.504***	-22.140***	-5.387***	0.195
	(0.735)	(6.901)	(0.995)	(8.980)	(0.932)	(9.479)	(1.271)	(11.717)	(0.955)	(8.286)	(1.260)	(10.934)
Fund fixed eff.	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Observations	23400	23400	13384	13384	34405	34405	19230	19230	23006	23006	13527	13527
R^2	0.016	0.048	0.013	0.029	0.013	0.020	0.011	0.020	0.029	0.046	0.019	0.025

Table 3: The flow-performance relationship of funds for professional investors.

*The table presents the results of regressions examining the flow-performance relationship of funds for professional investors from January 2007 to December 2016. The sample is partitioned by fund categories (equity, fixed-income and balanced funds). The dependent variable is the net flow to fund i in month t ($Flow_{it}$). The explanatory variables are the performance of the fund, measured by the return over the benchmark ($ReturnExcess_{it}$) or the Sharpe ratio ($SharpeRatio_{it}$), and variables to control for fund characteristics. The coefficients in Columns (1),(3),(5),(7),(9) and (11) are estimated by pooled OLS. The coefficients in Columns (2),(4),(6),(8),(10) and (12) are estimated including fund fixed effects. The table reports robust standard errors (in parentheses), clustered at the fund level. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

Fund category	Equity				Fixed income				Balanced			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$ReturnExcess_{t-1}$	0.069***	0.067***			0.052	0.091			0.006	-0.009		
	(0.018)	(0.021)			(0.068)	(0.079)			(0.030)	(0.021)		
$SharpeRatio_{t-1}$			0.084	0.069			0.003	0.008			-0.011	-0.015
			(0.212)	(0.204)			(0.010)	(0.011)			(0.014)	(0.015)
VIX_t	0.049***	0.026**	0.048***	0.039***	0.015	0.019	0.019	0.022	0.006	-0.012	-0.005	-0.025**
	(0.009)	(0.012)	(0.012)	(0.015)	(0.011)	(0.013)	(0.014)	(0.017)	(0.007)	(0.008)	(0.009)	(0.010)
$Crisis_t$	-1.538***	-0.874**	-1.377***	-0.750	-1.930***	-1.763***	-1.761***	-1.715***	-0.736***	-0.107	-0.488	0.179
	(0.350)	(0.384)	(0.426)	(0.466)	(0.458)	(0.458)	(0.528)	(0.498)	(0.281)	(0.291)	(0.328)	(0.327)
$\log FundSize_t$	0.376***	1.637***	0.331***	1.653***	1.086***	4.497***	1.044***	4.348***	0.582***	4.361***	0.577***	4.232***
	(0.039)	(0.324)	(0.053)	(0.362)	(0.047)	(0.323)	(0.065)	(0.370)	(0.039)	(0.258)	(0.053)	(0.311)
Age_t	-0.187***	-0.594***	-0.207***	-0.662***	-0.174***	-0.623***	-0.218***	-0.801***	-0.103***	-0.520***	-0.163***	-0.669***
	(0.016)	(0.058)	(0.026)	(0.075)	(0.015)	(0.078)	(0.021)	(0.108)	(0.011)	(0.049)	(0.016)	(0.060)
$\log NumInv_t$	-0.005	-0.922***	0.026	-1.102***	0.001	-1.530***	0.000	-1.591***	0.077**	-0.604**	0.099*	-0.993***
	(0.038)	(0.342)	(0.050)	(0.392)	(0.042)	(0.326)	(0.057)	(0.397)	(0.037)	(0.234)	(0.052)	(0.295)
$\log ManagerSize_t$	-0.048**	0.475*	-0.088***	0.578*	-0.269***	0.197	-0.260***	0.700	-0.197***	-0.126	-0.194***	-0.125
	(0.021)	(0.266)	(0.027)	(0.343)	(0.029)	(0.455)	(0.041)	(0.602)	(0.019)	(0.236)	(0.026)	(0.266)
$Ret \times FundSize_t$	-0.048***	-0.048***			0.024*	0.035			-0.013	-0.006		
	(0.013)	(0.015)			(0.014)	(0.023)			(0.020)	(0.019)		
$Ret \times Age_t$	-0.006**	-0.007***			-0.007	-0.015			-0.013**	-0.013***		
	(0.003)	(0.003)			(0.011)	(0.012)			(0.006)	(0.002)		
$SR \times FundSize_t$			-0.256	-0.100			0.005	0.004			-0.037	-0.046
			(0.225)	(0.246)			(0.007)	(0.005)			(0.050)	(0.038)
$SR \times Age_t$			-0.013	-0.010			0.000	-0.001			0.003	0.004
			(0.042)	(0.041)			(0.003)	(0.003)			(0.003)	(0.003)
Constant	-5.910***	-36.158***	-4.064***	-38.311***	-14.349***	-86.350***	-13.336***	-94.338***	-6.749***	-72.662***	-6.059***	-68.890***
	(0.784)	(6.307)	(1.052)	(7.886)	(0.853)	(11.131)	(1.186)	(14.851)	(0.725)	(6.425)	(0.991)	(6.982)
Fund fixed eff.	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Observations	26690	26690	15043	15043	55429	55429	31306	31306	88307	88307	49794	49794
R^2	0.012	0.028	0.012	0.027	0.011	0.031	0.011	0.027	0.006	0.033	0.006	0.029

Table 4: The impact of large outflows on fund returns.

*The table presents the results of regressions examining the impact of large outflows on future fund returns from January 2007 to December 2016. The sample is partitioned by investor type (retail or professional) and fund category (equity, fixed-income or balanced funds). The dependent variable is the excess return over benchmark of fund i in month t ($ReturnExcess_{it}$). The explanatory variables are the $Outflow_{it}$, which is an indicator variable equal to one if the net flow is lower than -10% of the fund's TNA, lagged fund returns and variables to control for fund characteristics. The coefficients are estimated by pooled OLS. The table reports robust standard errors (in parentheses). *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

	Retail investor			Professional investor		
	Equity	Fixed-Income	Balanced	Equity	Fixed-Income	Balanced
	(1)	(2)	(3)	(4)	(5)	(6)
$Outflow_{t-1}$	-0.214***	-0.043***	-0.083***	-0.068	0.008	0.037
	(0.051)	(0.008)	(0.024)	(0.056)	(0.008)	(0.025)
$ReturnExcess_{t-1}$	0.044***	0.038	0.050***	0.022***	0.051***	0.071
	(0.009)	(0.023)	(0.017)	(0.008)	(0.015)	(0.045)
$ReturnExcess_{t-2}$	-0.031***	0.096***	0.063***	-0.035***	0.111***	0.087***
	(0.009)	(0.021)	(0.017)	(0.008)	(0.014)	(0.020)
$ReturnExcess_{t-3}$	-0.034***	0.225***	0.012	-0.006	0.192***	0.043**
	(0.009)	(0.020)	(0.017)	(0.008)	(0.014)	(0.019)
$ReturnExcess_{t-4}$	0.032***	-0.168***	-0.018	0.064***	-0.109***	0.027
	(0.009)	(0.018)	(0.018)	(0.008)	(0.012)	(0.019)
$ReturnExcess_{t-5}$	-0.033***	0.076***	-0.023	-0.010	0.073***	0.003
	(0.009)	(0.020)	(0.016)	(0.008)	(0.012)	(0.018)
$ReturnExcess_{t-6}$	0.025***	0.101***	0.002	0.034***	0.069***	0.018
	(0.009)	(0.020)	(0.017)	(0.008)	(0.012)	(0.018)
VIX_t	0.024***	-0.004***	-0.014***	0.080***	-0.002***	-0.020***
	(0.004)	(0.001)	(0.002)	(0.004)	(0.001)	(0.002)
$Crisis_t$	-0.312*	0.111***	0.415***	-2.238***	0.069***	0.554***
	(0.165)	(0.023)	(0.074)	(0.171)	(0.026)	(0.109)
$\log FundSize_t$	0.071***	0.002	0.060***	0.099***	0.004	0.022**
	(0.022)	(0.003)	(0.009)	(0.021)	(0.003)	(0.011)
Age_t	-0.017***	-0.001	-0.003	-0.020***	-0.002***	-0.005*
	(0.005)	(0.001)	(0.002)	(0.006)	(0.001)	(0.003)
$\log NumInv_t$	-0.047***	-0.009***	-0.026***	-0.062***	-0.010***	-0.018
	(0.010)	(0.002)	(0.005)	(0.019)	(0.002)	(0.016)
$\log ManagerSize_t$	0.008	0.001	-0.009**	-0.018**	0.014***	0.003
	(0.009)	(0.002)	(0.004)	(0.008)	(0.002)	(0.006)
Constant	-1.106***	0.058	-0.496***	-2.211***	-0.325***	-0.037
	(0.391)	(0.055)	(0.161)	(0.385)	(0.067)	(0.208)
Observations	21616	32239	21144	24111	50964	80168
R^2	0.012	0.120	0.016	0.024	0.086	0.023

Table 5: The flow of funds and holdings of small banks' assets.
*The table presents the results of the DiD estimates of the effect of holdings of small banks' assets on fund flows. The dependent variable is the net flow to fund i in month t ($Flow_{it}$). $Crisis_t$ is an indicator variable equal to 1 for the post shock period (September 2008 to March 2009) and 0 for the pre shock period (February to August 2008). $RiskyAssets_i$ measures the fraction of fund TNAs invested in assets of small banks before the crisis. $DumRiskyAssets_i$ is an indicator variable equal to one if the fund is exposed to small banks. Columns (1) to (4) show the results for the sample of all funds and Columns (5) to (8) show the results for the sample of funds exposed to banks. Standard errors (in parentheses) are robust to heteroskedasticity and serial correlation, clustered at the fund level. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

	All funds				Funds exposed to banks			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_t$	-0.037***	-0.146**	-0.036***	-0.148**	-0.016**	-0.128	-0.012	-0.134
	(0.006)	(0.060)	(0.007)	(0.060)	(0.007)	(0.089)	(0.008)	(0.089)
$Crisis_t \times$	-0.083*	-0.103**			-0.341***	-0.296***		
$RiskyAssets_i$	(0.046)	(0.044)			(0.116)	(0.105)		
$Crisis_t \times$			-0.012	-0.019*			-0.034**	-0.034***
$DumRiskyAssets_i$			(0.010)	(0.010)			(0.013)	(0.012)
$\log FundSize_t$		-0.002		-0.002		-0.005		-0.006
		(0.017)		(0.017)		(0.016)		(0.016)
Age_t		0.194*		0.200**		0.194		0.214
		(0.099)		(0.099)		(0.143)		(0.144)
$\log NumInv_t$		0.004		0.002		0.014		0.011
		(0.020)		(0.021)		(0.018)		(0.018)
$ReturnExcess_t$		0.018**		0.018**		0.040**		0.038*
		(0.008)		(0.008)		(0.020)		(0.020)
$\log ManagerSize_t$		0.041*		0.043**		0.126***		0.138***
		(0.021)		(0.021)		(0.037)		(0.037)
Constant	0.002	-1.805***	0.002	-1.870***	-0.004	-4.110***	-0.005	-4.513***
	(0.003)	(0.679)	(0.003)	(0.683)	(0.003)	(1.001)	(0.003)	(0.996)
Observations	956	956	956	956	426	426	426	426
R^2	0.108	0.157	0.107	0.157	0.076	0.199	0.074	0.201

Table 6: The performance of funds and holdings of small banks' assets.

*The table presents the results of the DiD estimates of the effect of holdings of small banks' assets on the performance of funds. The dependent variable is the performance of the fund, measured by the return in excess of the benchmark ($ReturnExc_{it}$). $Crisis_t$ is an indicator variable equal to 1 for the post shock period (September 2008 to March 2009) and 0 for the pre shock period (February to August 2008). $RiskyAssets_i$ measures the fraction of fund TNAs invested in assets of small banks before the crisis. $DumRiskyAssets_i$ is an indicator variable equal to one if the fund is exposed to small banks. Columns (1) to (4) show the results for the sample of all funds and Columns (5) to (8) show the results for the sample of funds exposed to banks. Standard errors (in parentheses) are robust to heteroskedasticity and serial correlation, clustered at the fund level. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

Fund category	All funds				Funds exposed to banks			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_t$	0.031	-0.273	0.060	-0.322	0.042	-0.923	0.077	-0.976
	(0.041)	(0.464)	(0.047)	(0.461)	(0.047)	(0.691)	(0.053)	(0.700)
$Crisis_t \times$	-0.512*	-0.586*			-0.691*	-0.873**		
$RiskyAssets_i$	(0.286)	(0.299)			(0.382)	(0.436)		
$Crisis_t \times$			-0.166**	-0.220***			-0.159*	-0.209**
$DumRiskyAssets_i$			(0.070)	(0.074)			(0.089)	(0.096)
$\log FundSize_t$		-0.015		-0.005		-0.051		-0.042
		(0.071)		(0.072)		(0.078)		(0.078)
Age_t		0.531		0.687		1.573		1.743
		(0.755)		(0.753)		(1.195)		(1.232)
$\log NumInv_t$		-0.137		-0.161*		0.057		0.026
		(0.086)		(0.087)		(0.088)		(0.079)
$\log ManagerSize_t$		0.140		0.158		-0.140		-0.093
		(0.210)		(0.210)		(0.300)		(0.295)
Constant	-0.114***	-4.976	-0.116***	-6.216	-0.143***	-4.371	-0.144***	-6.539
	(0.020)	(4.936)	(0.020)	(5.038)	(0.023)	(11.744)	(0.022)	(11.911)
Observations	956	956	956	956	426	426	426	426
R^2	0.003	0.017	0.009	0.027	0.005	0.034	0.016	0.051

Table 7: Changes in portfolio holdings of bank deposits.

*The table shows how funds adjusted their portfolios in response to the Lehman's default and the extension of term deposit guarantees. The dependent variables are the share of fund's TNA invested in deposits of small banks (Columns (1) to (4)) and deposits of large banks (Columns (5) to (8)). Columns (1),(3),(5) and (7) show the results of a 2SLS estimation and Columns (9) and (10) show the estimates of a random effects Tobit regression. $Crisis_t$ is an indicator variable equal to 1 for 2008-2009 period, and 0 otherwise. $ExtGuarantee_t$ is an indicator variable equal to 1 for the 2009 period, and 0 otherwise. Columns (1),(2),(5),(6) and (9) show the results for the sample of all funds and Columns (3),(4),(7),(8) and (10) show the results for the sample of funds exposed to banks. Standard errors (in parentheses) are robust to heteroskedasticity and serial correlation. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

	Small Bank Deposits				Large Bank Deposits				Small	Large
	All funds		Exposed to banks		All funds		Exposed to banks		Tobit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$Crisis_t$	-0.011***	-0.012***	-0.024***	-0.030***	0.060***	0.059***	0.103***	0.109***	-0.043***	0.127***
	(0.003)	(0.003)	(0.007)	(0.007)	(0.005)	(0.004)	(0.008)	(0.008)	(0.008)	(0.008)
$ExtCoverage_t$	0.006*	0.006**	0.012	0.012*	-0.022***	-0.022***	-0.044***	-0.042***	0.023***	-0.059***
	(0.003)	(0.003)	(0.008)	(0.006)	(0.005)	(0.004)	(0.009)	(0.008)	(0.008)	(0.007)
$Flow_t$	0.006		0.029		0.013		0.086			
	(0.015)		(0.041)		(0.021)		(0.047)			
$Crisis_t \times$	0.008		0.053		0.002		-0.113			
$Flow_t$	(0.020)		(0.063)		(0.028)		(0.072)			
$ExtCoverage_t \times$	-0.028		-0.177**		-0.039		-0.071			
$Flow_t$	(0.018)		(0.069)		(0.027)		(0.079)			
$\log FundSize_t$	-0.003	-0.005	-0.005	-0.009	0.005	0.005	0.004	0.001	0.010*	0.014***
	(0.003)	(0.003)	(0.007)	(0.007)	(0.004)	(0.004)	(0.008)	(0.008)	(0.005)	(0.005)
Age_t	-0.000	0.002	-0.010	0.003	-0.011	-0.009**	-0.004	-0.020*	0.022***	0.007
	(0.006)	(0.003)	(0.016)	(0.009)	(0.008)	(0.004)	(0.018)	(0.010)	(0.007)	(0.007)
$\log NumInv_t$	-0.000	-0.001	-0.004	-0.008	-0.006	-0.007	-0.010	-0.011	-0.003	-0.000
	(0.003)	(0.003)	(0.008)	(0.008)	(0.005)	(0.004)	(0.009)	(0.009)	(0.004)	(0.004)
$\log ManagerSize_t$	0.001	0.004	0.004	0.009	0.009	0.008	0.011	0.002	0.001	0.017***
	(0.004)	(0.004)	(0.015)	(0.014)	(0.006)	(0.005)	(0.017)	(0.016)	(0.004)	(0.004)
Constant	0.071	0.025	0.156	0.037	-0.179	-0.150	-0.189	0.181	-0.490***	-0.859***
	(0.090)	(0.076)	(0.333)	(0.296)	(0.129)	(0.111)	(0.381)	(0.348)	(0.099)	(0.099)
Observations	1332	1447	591	627	1332	1447	591	627	1447	1447
R^2	0.026	0.025	0.084	0.078	0.224	0.213	0.428	0.411		

Table 8: Pre-shock sample means

The table presents p-values for tests of the null hypothesis that mean pre-shock levels in June 2008 (Panel A) and trends over the December 2007–June 2008 period (Panel B) are equal across funds not exposed to small banks (Column (1)) and funds exposed to those banks (Column (2)). Standard errors in parentheses.

	Funds not exposed to small banks (1)	Funds exposed to small banks (2)	Diff. of means (3)	p-value of diff. (4)
A. Levels in Jun 2008				
Flow (% of TNA)	-.020	-.014	-.006	0.774
	(.014)	(.010)	(.023)	
ReturnExcess (p.p.)	-.345	-.145	-.200	0.331
	(.126)	(.059)	(.205)	
log *FundSize*	18.357	18.623	-.266	0.301
	(.104)	(.315)	(.256)	
Age (years)	4.528	6.877	-2.348	0.000
	(.226)	(.376)	(.434)	
log *NumInv*	3.491	3.775	-.283	0.250
	(.129)	(.208)	(.246)	
B. Changes Dec 2007–Jun 2008				
Flow (% of TNA)	.077	.182	-.105	0.355
	(.065)	(.085)	(.113)	
ReturnExcess (p.p.)	-.400	-.032	-.367	0.590
	(.432)	(.335)	(.683)	
log *FundSize*	.127	.236	-.108	0.356
	(.068)	(.085)	(.117)	
log *NumInv*	.207	.246	-.039	0.768
	(.080)	(.088)	(.134)	
Num. of funds	316	120		

Table 9: Robustness: falsification test.

*The table presents the results of the DiD estimates of the effect of holdings of small banks' assets on the flow and the performance of funds falsely assuming that the Lehman's default occurred in December 2007. The dependent variables are the net flow to fund i in month t ($Flow_{it}$) in Columns (1) to (4) and the performance of the fund, measured by the return in excess of the benchmark ($ReturnExcess_{it}$) in Columns (5) to (8). $Crisis_t$ is an indicator variable equal to 1 for January–May 2008 period and 0 for the July–December 2007 period. $RiskyAssets_i$ measures the fraction of fund TNAs invested in assets of small banks before the crisis. $DumRiskyAssets_i$ is an indicator variable equal to one if the fund is exposed to small banks. Columns (1) and (2) and Columns (5) and (6) show the results for the sample of all funds and Columns (3) and (4) and Columns (7) and (8) show the results for the sample of funds exposed to banks. Standard errors (in parentheses) are robust to heteroskedasticity and serial correlation, clustered at the fund level. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.*

Dep. variable	$Flow_{it}$				$ReturnExcess_{it}$			
	All funds		Exposed to banks		All funds		Exposed to banks	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_t$	-0.184***	-0.181***	-0.396***	-0.392***	0.478	0.493	0.844	0.833
	(0.060)	(0.060)	(0.122)	(0.122)	(0.808)	(0.800)	(0.790)	(0.786)
$Crisis_t \times$	0.050		-0.048		0.389		-0.099	
$RiskyAssets_i$	(0.039)		(0.125)		(0.398)		(0.156)	
$Crisis_t \times$		0.006		0.001		0.050		-0.022
$DumRiskyAssets_i$		(0.011)		(0.014)		(0.061)		(0.031)
Constant	-2.734**	-2.655*	-8.621***	-8.553***	-1.478	-1.043	1.068	0.416
	(1.379)	(1.370)	(3.184)	(3.236)	(7.938)	(7.924)	(9.908)	(10.105)
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Fund Fixed Eff.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	800	800	377	377	800	800	377	377
R^2	0.129	0.127	0.170	0.170	0.022	0.021	0.134	0.135

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