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Mutual Funding

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Using data on Spanish mutual funds, we show that bank-affiliated funds provide funding support to their parent company via purchases of bonds in the primary market. Support from affiliated funds is more sizeable in crisis times and for riskier banks. These trades generate negative abnormal returns and thus benefit banks at the expense of fund investors. To minimize negative effects on their asset management business, banks concentrate the burden of funding support in funds without performance fees and those catering to retail investors. We provide evidence consistent with funding support helping to limit credit rationing over the 2008–2012 period. (*JEL* G23, G32, G21)

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As financial conglomerates expand the array of financial services they provide, new potential conflicts of interest arise between the conglomerate and its clients. However, the mere existence of conflicts of interest does not necessarily imply that they will be abused because abusing conflicts of interest entails potential legal costs, reputational costs, and loss of future business. In this paper, we study for the first time the use of affiliated mutual funds managed by bank-controlled

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firms as a source of funding for banks and investigate whether conglomerates strategically balance the benefits of abusing this conflict of interest against its costs.

While conflicts of interest within financial conglomerates have already received attention in the academic literature (see Mehran and Stulz 2007 for a survey), we unveil a novel channel. It is rooted in the observation that a large number of mutual funds around the world are not independent entities but controlled directly or indirectly by a financial intermediary that is engaged in banking and other financial activities.[1] We posit that banks can use affiliated mutual funds as an alternative source of funding, in particular at times when liquidity is scarce and funding markets are under stress. Funds managed by bank-affiliated asset management firms can help their parent banks decrease funding costs by artificially increasing demand at the funding stage.

Unlike other conflicts of interest that have been investigated in the literature, the conflict of interest that we study in this paper is likely to emerge only under extraordinary circumstances, such as those experienced by European banks since the default of Lehman Brothers in 2008. Indeed, while funding from affiliated funds is of little value to banks in normal times, it becomes valuable in times of financial distress. In other words, the possibility of using affiliated mutual funds as an alternative source of funding for the parent bank is a potential conflict of interest that stays dormant until a banking crisis hits. Because banking crises are rare, this conflict of interest has historically remained under the radar of both investors and regulators. Moreover, the rare-event nature of this conflict of interest makes it particularly appropriate to investigate the strategic response of banking groups to a change in the trade-off between the benefits of abusing conflicts of interest and the costs of doing so.

Furthermore, the conflict of interest that we analyze in this paper has potentially far-reaching consequences that go beyond the redistribution of wealth between different groups of stakeholders in the financial conglomerate. More specifically, because the motivation for banks to use affiliated mutual funds' resources is to overcome temporary funding constraints, it is natural to ask whether the availability of such an alternative source of funding actually helps banks weather periods of financial distress, and limit the extent of credit rationing to the nonfinancial sector.

To achieve our goal, we investigate funding support by Spanish bank-affiliated mutual funds in the primary market using data from the 2000–2012 period. Spain is a particularly appropriate laboratory for our purposes for three reasons. First, its mutual fund industry is largely dominated by banks, whose asset management divisions account for roughly three quarters of the total assets under management (AUM).

[1] Ferreira, Matos, and Pires (2018) show that around 40% of mutual funds worldwide are run by commercial banks. The share of bank-affiliated funds in the United States is lower (around 20%), but has picked up in recent years with the repeal of the Glass-Steagall Act in 1999.

Second, the Spanish banking sector entered a prolonged period of severe distress following the 2008 Lehman bankruptcy, facing a bursting real estate bubble and the European sovereign debt crisis. Banks' access to key wholesale markets was severely limited, which increased their reliance on central bank liquidity and increased competition for stable funding sources such as retail deposit rates.[2] Consequently, the incentives to tap related entities such as affiliated mutual funds for extra funding were very high.[3]

Third, unlike in the United States, related-party transactions involving mutual funds are not prohibited in Spain. Spanish law mandates that asset management companies act in the best interest of mutual fund investors but affords asset management firms a great deal of discretion in dealing with conflicts of interest. Consequently, the only explicit constraints on purchases of affiliated firms' securities by Spanish mutual funds are general position limits aimed at ensuring portfolio diversification.[4]

Consistent with our hypothesis, we show that bank-affiliated mutual funds purchase more of their parents' bond issues in the primary market than their nonaffiliated peers. Moreover, we find that excess funding from affiliated mutual funds, "mutual funding," strongly increases in times of financial stress, consistent with banks reacting to changes in incentives to use their affiliated mutual funds as a source of funding. Also, this support is more prevalent among banks that rely more on central bank liquidity, have a higher ratio of nonperforming loans, and have recently experienced a rating downgrade. Funding support occurs through the extensive margin, rather than the intensive margin. Finally, we find that affiliated purchases are particularly strong for subordinated debt, which is more sensitive to financial stress than senior debt. In sum, both our time-series and cross-sectional results support the hypothesis that banks are more likely to resort to affiliated funds as an alternative source of funding when the incentives to abuse the conflict of interest are stronger.

The funding support to parent banks by affiliated mutual funds documented in this paper is economically significant. When aggregating bond purchases across all funds of the same asset management group (AMG), we find that excess purchases of parent debt by affiliated funds account for 2.85% of the total amount issued throughout the entire sample period, corresponding to 514 million EUR per bank or 14.4 billion EUR on aggregate. While funding support is absent in normal times, it amounts to 7% of the amount issued in crisis times (11.9 billion EUR on aggregate).

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[2] See Penty and Sirletti (2011).

[3] Portfolio decisions are in the hands of asset managers, who have incentives to avoid the negative consequences of their parent bank's financial distress, such as cost-cutting policies, loss of captive clients, and liquidation of the bank's asset management division. Bankia (2012) and Banco Popular (2017) offer two illustrative examples where defaults were associated with downsizing.

[4] Appendix B provides a detailed description of the regulation of related-party transactions and minimum diversification limits in Spain.

In addition to excess purchases of banks' debt, funding support also takes place through term deposits and short-term paper.[5] In contrast, we find no evidence of funding support through purchases of preferred shares, which Spanish banks were able to place directly with retail clients, or through purchases of seasoned equity offerings.

Banks can also have affiliated funds trade in the secondary market in order to reduce yields around the time of new issues and hence decrease debt refinancing costs. We choose to focus on the primary market because the proceeds of the issue accrue directly to the parent bank and therefore constitute genuine debt financing. In any case, we do not find evidence of bond price support through secondary market purchases.

Funding support is detrimental to affiliated mutual fund investors' interests. In particular, bond issues with primary market participation by affiliated mutual funds display 29 (33) basis points (bp) lower abnormal returns on the issuance day (week) than other issues of the same bank, which is indicative of overpricing. Therefore, we discard the alternative explanation that the documented trading pattern is motivated by insider information or preferential treatment in the placement of underpriced bonds.

The fact that affiliated mutual fund investors are hurt by mutual funding suggests that abusing this conflict of interest is costly to the bank-controlled asset management firm for at least two reasons. First, fund underperformance reduces future fee revenues if flows of new money to mutual funds depend on past performance (see, e.g., Sirri and Tufano 1998). We confirm a positive flow-performance relationship in our data. The relationship, however, is much weaker for funds catering to retail investors, consistent with more efficient monitoring by institutional investors (Del Guercio and Tkac 2002; James and Karceski 2006; Evans and Fahlenbrach 2012). Second, some funds charge performance fees, so the asset management firm bears a direct cost of underperformance. Therefore, if asset management firms wish to minimize the cost of mutual funding, they will be more likely to use retail funds and funds that do not charge performance fees. We find that this is indeed the case, which supports the idea that mutual funding is the outcome of a strategic decision taken at the conglomerate level.

Finally, we ask whether the availability and use of funding from affiliated mutual funds allows banks to circumvent financial stress and ease credit rationing in crisis times. Controlling for demand effects, we find that affiliated bond purchases are associated with higher (less negative) credit growth in the 2008:Q4–2012:Q2 period. To the best of our knowledge, we are the first to show evidence suggesting that the presence of an asset management division

[5] Our main analysis focuses on funding support through bond purchases rather than through other instruments. This decision is motivated by the fact that bonds, unlike short-term paper and deposits, provide medium and long-term financing that is more difficult to substitute with other sources, in particular central bank liquidity. Moreover, data availability limits our ability to perform some of the tests for the two other fixed income instruments.

in financial conglomerates can help mitigate negative shocks to credit supply to the nonfinancial sector.

Taken together, our findings support the hypothesis that in the presence of lax regulation of related-party transactions, financial institutions will use affiliated mutual funds to obtain additional funding at better-than-market conditions, and will do so more when the incentives are larger and the costs are lower. While our paper is the first to provide systematic evidence on the funding activities of bank-affiliated mutual funds, two recent scandals in Portugal and Puerto Rico provide additional anecdotal evidence consistent with our findings.[6]

1. Related Literature

Our paper contributes to the growing literature on conflicts of interest in the mutual fund industry and their influence on portfolio decisions.[7] Most closely related to our work is the study of Golez and Marin (2015), who provide evidence consistent with bank-affiliated funds supporting the stock price of the umbrella institution, in particular after bad news and around seasoned equity offerings. Our analysis is complementary to theirs as we focus on bond purchases by bank-affiliated funds. However, our paper departs from Golez and Marin (2015) along several important dimensions. First, we focus on primary market activity, which ensures that the proceeds directly accrue to the controlling financial institution. This is different from the more indirect channel of price manipulation in the secondary market. The sheer magnitude of the funding support that we estimate in the paper together with the evidence that funding support may help banks limit the extent of credit rationing to nonfinancial sector during crises suggests that the direct channel is indeed important. Second, we exploit both time-series and cross-sectional variation in financial distress and show that conglomerates respond strategically to changes in both the benefits and costs of using affiliated mutual funds. Third, while Golez and Marin (2015) do not find that affiliated funds' trades predict future equity returns, we find that funding support predicts lower bond returns, and therefore hurts investors. Interestingly, we find no evidence of mutual funding through seasoned equity offerings, which, together with lack of evidence of price support in the secondary bond market, suggests that purchases of parent banks' debt and equity by affiliated mutual funds play very distinct roles within banks' strategies. Finally, we study the consequences of funding support for credit supply, which is new to the literature.

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. Ferreira, Matos, and Pires (2018) document widespread

[6] See Johnson and Wise (2014) and Walsh (2015).

[7] See, for example, Lakonishok et al. (1991), Chevalier and Ellison (1997), and Carhart et al. (2002).

underperformance of bank-affiliated mutual funds and link it to investments in client stocks and the subsequent chances of obtaining additional lending business. Bagattini, Fecht, and Weber (2018) document that German banks sold off risky euro-area sovereign bonds to their affiliated mutual funds during the sovereign debt crisis. Finally, Ghosh, Kale, and Panchapagesan (2014) find evidence of conflicts of interest in the trading decisions of mutual funds affiliated to Indian business groups.[8] In contrast, some authors show that close ties between asset managers and financial institutions can also be beneficial to fund investors. Massa and Rehman (2008) find that bank-affiliated funds tend to overweight the stocks of companies that obtain a loan from the parent bank around the deal date. In turn, these investments deliver superior risk-adjusted performance, corroborating the existence of information flows within financial conglomerates. 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 the Lehman's bankruptcy. In a similar vein, Franzoni and Giannetti (2019) provide evidence consistent with hedge funds affiliated with a financial conglomerate benefitting from more stable funding than stand-alone hedge funds in times of turmoil. By showing that within-conglomerate funding can flow in the opposite direction, that is, from the asset management branch to the bank in financial distress, our paper contributes to this emerging literature that investigates how financial institutions direct investment from healthy business units to business units in financial distress.

Finally, several papers study how profit maximization by asset management firms can lead to redistribution of wealth across mutual fund investors. Gaspar, Massa, and Matos (2006) and Eisele et al. (2019) show how mutual fund families shift performance between funds in order to generate higher fees and "stars" that attract investor flows. Bhattacharya, Lee, and Pool (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.

2. Data and Descriptive Statistics

To construct our data set, we combine data drawn from different sources. The data on mutual funds' portfolio holdings and mutual fund characteristics are provided by CNMV (the Spanish securities markets regulator) and correspond to the entire universe of Spanish mutual funds at the quarterly frequency for the period 2000:Q1–2012:Q2. The data set includes fund-level information on the fee structure, investment style, number of fund investors, and net asset value

[8] Cohen and Schmidt (2009), Ritter and Zhang (2007), and Hao and Yan (2012) are other papers that investigate how conflicts of interest stemming from the provision of different financial services by the same firm may hurt mutual fund investors.

(NAV). It also allows individual funds to be mapped to their asset management companies and ultimate parent companies.[9]

We consider that a given fund is affiliated to a bond's issuer if the ultimate parent of the fund's AMG is a Spanish bank and is the same as the ultimate parent of the issuer.[10] Because our sample period is characterized by a significant number of bank mergers and takeovers, we hand-collect public information on these events and ensure that the bank-fund linkages are adjusted appropriately.

In addition, we obtain data on the bond issuance activity (excluding money market instruments) of Spanish financial institutions from Dealogic. We screen the database for EUR-denominated fixed income securities issued between 2000:Q1 and 2012:Q2, where the issuer is a financial institution and both the issuer and the issuer parent are domiciled in Spain. We exclude perpetuities, nonrated issues, and securities issued by Special Purpose Vehicles. This procedure yields a total of 1,092 Spanish bank bonds, corresponding to 1,155 distinct issues.[11] For each offering, the data set contains information on the issue date, amount issued, maturity, and a number of additional bond characteristics. For some our tests, we require data on bond yields, which we obtain from Datastream.

Bank-related information is obtained from a proprietary data set at Bank of Spain. The data set is at the monthly frequency and spans from January 2005 to June 2012, so given the quarterly frequency of our mutual fund data set we use the information corresponding to the last month in each quarter.

We screen the universe of mutual fund portfolios for bonds identified in Dealogic and identify a total of 674 individual securities held by at least one mutual fund during our sample period. Given that our analysis aims at the identification of possible funding support in the primary market by mutual funds, we discard securities that (1) are not purchased by at least one fund in the quarter of issuance and/or (2) are issued by a bank that is not in direct control of at least one asset management company.[12] This yields a final sample of 504 individual issues (468 securities) from 28 different financial institutions.[13] In

[9] For 30 mutual funds in our sample, the fund's asset management company outsources portfolio management decisions to another firm, the so-called "subadvisor." In our analysis, we use the fund's asset management company, not the subadvisor, to determine the fund's ultimate parent company. However, our results are almost identical if we drop subadvised funds or if we use the subadvisor to identify the fund's parent company.

[10] In the Internet Appendix, we extend our sample to include bonds issued by foreign banks. Doing so does not materially affect our results.

[11] There are more issues than bonds because some securities are fungible and allow for the reissuance of additional securities after the initial offering. For our analysis, we consider reissued securities as new issues.

[12] Some banks (usually co-operative or savings banks) pool their asset management activities in a single umbrella organization (e.g., Ahorro Corporación). These institutions do not have direct and/or full control over the asset management company. Hence, their bond issues (but not their funds) are excluded from our analysis.

[13] These 28 banks are Banca March, Bancaja, Banco de Sabadell, Banco Guipuzcoano, Banco Pastor, Banco Popular, Banco Santander, Bankia (Caja Madrid), Bankinter, BBVA, Kutxabank (Bilbao Bizkaia Kutxa), Caixabank (La Caixa), Caixa de Girona, Caixa Laietana, Caixa Manresa, Caixa Tarragona, Caixa Terrassa, Caja Asturias, Caja Cantabria, Caja Duero, Caja de Gipuzkoa y San Sebastián, Caja del Mediterraneo, Caja España, Caja Navarra, Caja Vital, Catalunya Caixa, Ibercaja, and Unicaja.

the Internet Appendix, we document that our final sample of bank bonds is similar to the entire universe of Spanish bank bonds found in Dealogic.

To investigate bond purchases of Spanish mutual funds, we select our sample of mutual funds as follows. We begin by excluding all funds that never invest into any Spanish bank bond. Moreover, we discard passive funds and all-equity funds, as well as funds with incomplete history. We also exclude the first quarter of each fund's history to account for possible incubation bias (Evans 2010), and furthermore drop the last quarter before a fund's liquidation as well as the quarter in which a change in the fund's parent company occurred. We also discard funds whose AUM drop below 1 million EUR. Finally, we discard funds with less than four consecutive reporting quarters after the application of all these filters. The final sample consists of 1,875 funds and 62,629 fund-quarter observations.

Panel A of Table 1 provides an overview of how bond issuance and the scope of asset management operations vary across the 28 financial institutions in our sample. The average bank accounts for 18 bond issues, ranging from a low of 1 bond to a maximum of 108. The average bond size (per issue) also varies considerably across banks. Similarly, there is considerably heterogeneity across banks in terms of the asset management activities under their control. Panel B contrasts the size of the asset management operations of these 28 banks with the remainder of the industry for our final sample of mutual funds. On average, they account for roughly half of all mutual funds, and nearly 80% of the total AUM. The remaining assets are roughly equally split among other domestic banks, domestic nonbanks, and foreign entities (including both banks and nonbanks).

Crucially, we assume that purchases in the quarter of issuance always occur in the primary market.[14] Similarly, bond sales in the quarter of maturity are classified as held until redemption, while trades in the remaining quarters are naturally attributed to the secondary market. In the Internet Appendix, we show that around 41% of all new investment positions in bank bonds are established in the quarter of issuance and around one-third of all terminations occur in the quarter of maturity, which confirms a very significant role for the primary market and the importance of buy-and-hold strategies among bond mutual funds.

Panel A of Table 2 provides some summary statistics for a number of mutual fund characteristics, computed across our 62,629 fund-quarter observations. In addition, the last four rows also provide a breakdown across different fund types. Moreover, panel B of Table 2 reports summary statistics for two bank characteristics that we use to capture stress at the bank level: the nonperforming loans (NPL) ratio and changes in the average credit rating (positive numbers

[14] Although our data do not allow us to formally identify funds' direct participation in the initial sale of a security, this assumption is likely to be realistic because of the low liquidity in the secondary market for European corporate bonds. Moreover, we show in the Internet Appendix that our main results are unchanged when restricting the sample to bonds issued in the last 2 weeks of a quarter, which mechanically reduces the probability of misclassifying secondary market trading as primary market trading.

Table 1
Descriptive statistics for funds and bond issuance activity

A. Bond issuance and asset management operations for sample banks (N = 28)

Variable	Mean	SD	Min	Max
Number of bonds issued	18	25	1	108
Average amount (Mio. EUR)	556.7	443.4	89.0	1,538.1
Average AUM (Bln. EUR)	3.9	7.4	0.1	30.7
Average number of funds	25.2	26.4	4.0	112.5

B. Distribution of mutual fund affiliations

Affiliation	Avg. # funds	Avg. AUM (Bln EUR)
Sample banks	685.7	107.1
Other domestic banks	199.4	9.5
Domestic nonbanks	176.0	8.7
Foreign (banks and nonbanks)	157.6	9.9
Total	1,218.7	135.2

Panel A of this table provides an overview of the issuance activity and the scope of the asset management operations across the 28 bond-issuing financial institutions ("sample banks") with control over at least one asset management firm. All numbers are based on the cross-section of individual time-series averages. Panel B provides a breakdown of our sample of mutual funds into four different groups of affiliation: the 28 bond issuers ("sample banks"), other domestic banks, domestic nonbanks, and foreign institutions (both banks and nonbanks).

Table 2
Summary statistics for mutual fund and bank characteristics

A. Fund characteristics

	Mean	Median	SD	P5	P95
FUND_AUM (€000,000)	112.00	31.70	307.00	4.20	528.00
AMG_AUM (€000,000)	7,740.00	2,360.00	11,600.00	122.00	43,600.00
RET (%)	0.39	0.50	2.84	−3.58	4.20
FEES (%)	1.44	1.43	0.62	0.30	2.66
FLOW/AUM (%)	−0.29	−1.78	20.42	−21.13	27.52
RETAIL (%)	58.83	100.00	49.23	0	100
FUND_RET_VOLA (%)	1.68	0.99	2.09	0.06	5.78
TURNOVER (%)	19.53	11.18	32.42	0.86	75.91
AGE (# quarters)	26.52	22.25	18.32	4.22	74.24
GUARANTEED (%)	39.08	–	–	–	–
OTHER (%)	10.81	–	–	–	–
FIXED_INCOME (%)	31.55	–	–	–	–
HYBRID (%)	18.56	–	–	–	–

B. Bank characteristics

	Mean	Median	SD	P5	P95
NPL (%)	2.46	1.06	2.48	0.37	7.12
Δ RATING (one unit per notch)	0.17	0.00	0.61	−1.00	5.50

Panel A of this table contains summary statistics for the fund characteristics defined in Appendix A (based on the final sample of 62,629 fund-quarter observations): AUM (*FUND_AUM*), AMG's AUM (*AMG_AUM*), quarterly returns (*RET*), fees (*FEES*), net in-/outflow relative to AUM (*FLOW/AUM*), indicator of retail investors' fund (*RETAIL*), the standard deviation of quarterly returns over the prior four quarters (*FUND_RET_VOLA*), purchases/sales turnover (*TURNOVER*), and fund age in quarters (*AGE*). We also provide a breakdown of funds across the four different types retained in the sample: guaranteed funds (*GUARANTEED*), fixed income funds (*FIXED_INCOME*), hybrid funds (*HYBRID*), and other funds excluding index funds and equity funds (*OTHER*). Panel B contains summary statistics for the ratio of nonperforming loans (*NPL*) and rating changes (*ΔRATING*) of the 28 banks to which the funds in our sample are affiliated, where positive numbers represent downgrades (in notches).

denote downgrades), as defined in Appendix A. For reasons of confidentiality, we cannot provide summary statistics on our third bank-level variable of stress, the amount of funds borrowed from the Eurosystem.

3. Empirical Evidence on Funding Support

This section contains our main tests for the funding support activities of bank-affiliated mutual funds. While we focus on bond purchases in the primary market, we also present some results for bond market trading in the secondary market.

3.1 Funding support in the primary bond market

We begin our inquiry into the potential funding support activities of bank-affiliated mutual funds by examining their direct participation in new bond issues relative to other mutual funds. Our empirical strategy is based on the following linear panel regression

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t}, \quad (1)$$

where $P_{f,i,t}$ denotes the EUR amount purchased in quarter t (the quarter of issuance) by fund f of bond issue i, $ISSUANCE_{i,t}$ denotes the total EUR amount issued of bond i in quarter t, and $AFF_{f,i,t}$ is an indicator variable that takes the value of 1 if mutual fund f is affiliated with the issuer of bond i at time t (regardless of whether or not fund f buys the bank's bond issue) and zero otherwise. α_{AMG}, α_S, and α_t denote AMG, investment style, and time fixed effects.[15] $X_{f,i,t}$ is a vector of control variables that includes fund characteristics as well as bond characteristics that are likely to affect funds' trading behavior. Appendix A provides definitions of these variables. Our analysis is conducted at the fund-issue-quarter level, so the number of observations in a given quarter is equal to the number of active funds times the number of bond issues. The inclusion of AMG fixed effects implies that the coefficient β_1 is identified by comparing the participation of funds from the same asset management group in the issuance of bonds by affiliated and nonaffiliated issuers. Hence, β_1 captures the *excess* participation in affiliated bond issues.

As argued in the introduction, funding support can entail legal costs, reputational costs, and loss of future business. Therefore, we expect conglomerates to use this alternative source of funding more when the benefits

[15] In a few cases, several fund families are affiliated with the same ultimate owner, and they are then pooled under the umbrella of one asset management group. We obtain equivalent results throughout the entire paper if we use fixed effects at the fund family level, the individual fund level, or the fund-quarter level.

are higher, that is, in times of financial distress. To test this hypothesis, we augment the above regression model to

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 AFF_{f,i,t} \times STRESS_{i,t} + \beta_3 STRESS_{i,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t}, \quad (2)$$

where $STRESS_{it}$ is a variable that captures periods of impaired access to funding markets for the issuer of bond i. We use several alternative specifications for this variable. The first one relies on the bankruptcy of Lehman Brothers as an exogenous event that caused liquidity in key funding markets to evaporate. In particular, we define $STRESS_{i,t}$ as a dummy variable that takes a value of one starting in 2008:Q3 until the end of our sample period, and zero before that date. Note that this post-Lehman dummy covers the period of the European sovereign debt crisis, too. Alternatively, we use three alternative definitions of $STRESS_{it}$ that vary at the issuer-quarter level. First, we use the amount of funds borrowed from the Eurosystem in a given quarter relative to total assets. Second, we use the ratio of gross nonperforming loans over total loans. Third, we use the change in the credit rating (in notches) over the previous two quarters. We construct this variable so that positive values represent downgrades and also correspond to a higher level of stress (see Appendix A).

When using the post-Lehman dummy as a measure of stress, the coefficient on the interaction term in Equation (2), β_2, can be interpreted as a difference-in-differences estimator where the treatment is the financial crisis, the treatment group consists of all funds f that are affiliated with the issuer of bond i and the control group is comprised of all other funds in our sample. Note that, unlike in most difference-in-differences settings, both treatment and control groups vary across different observations, that is, bond issues, even within the same quarter. Thus, when both the parent bank of a given fund and another bank issue bonds, the fund is part of the treatment group for the first bond issue, and part of the control group for the second bond issue.

Table 3 contains the resultant coefficient estimates, where all standard errors are clustered at the AMG level. The results in Column 1 refer to Equation (1) and suggest that, other things equal, bank-affiliated mutual funds purchase more of their parents' debt in the primary market than nonaffiliated funds. On average, each affiliated fund purchases 0.04% of the total amount issued in excess of the purchases by otherwise similar nonaffiliated funds. These abnormal purchases are statistically significant at the 5% level. While this result confirms the excess participation of affiliated funds in their parent banks' bond issuance, we need to estimate the excess purchases of *all* funds within the same AMG for assessing the economic magnitude of funding support. We perform this analysis further below.

Columns 2–6 of Table 3 report the results from the estimation of Equation (2). In Column 2, $STRESS_{i,t}$ is defined as the post-Lehman dummy.

Table 3
Funding support in the primary market

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample		Issuer-affiliated funds only			
		Post-Lehman	Post-Lehman	Eurosystem borrowing	NPL ratio	Rating change
AFF	0.0418**	−0.0018	0.0013	0.0437**	0.0010	0.0399**
	(0.019)	(0.002)	(0.002)	(0.018)	(0.008)	(0.019)
AFF × STRESS		0.0952***	0.0878**	0.0274**	0.0166**	0.0386*
		(0.034)	(0.036)	(0.012)	(0.008)	(0.023)
STRESS				−0.0006	−0.0043***	0.0004
				(0.001)	(0.002)	(0.003)
LOG_FUND_AUM	0.0093***	0.0094***	0.0108***	0.0115***	0.0109***	0.0108***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
LOG_AMG_AUM	−0.0072*	−0.0029	−0.0033	−0.0090	−0.0067	−0.0112
	(0.004)	(0.002)	(0.005)	(0.006)	(0.006)	(0.007)
LAG_RET	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
FLOW/AUM	0.0095	0.0092	0.0133	0.0144	0.0130	0.0138
	(0.009)	(0.009)	(0.021)	(0.022)	(0.021)	(0.021)
FEES	0.0003	0.0001	−0.0002	−0.0002	−0.0001	−0.0001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
RETAIL	−0.0034	−0.0034	−0.0036	−0.0039	−0.0036	−0.0037
	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)
LOG_ISSUANCE	−0.0084**	−0.0085**	−0.0113***	−0.0113***	−0.0114***	−0.0111***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
MATURITY	−0.0001	−0.0002	−0.0007*	−0.0008*	−0.0007*	−0.0007*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SECURED	0.0070	0.0072	0.0142**	0.0132**	0.0148**	0.0137**
	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.006)
CALLABLE	0.0039	0.0043	−0.0020	−0.0017	−0.0022	−0.0023
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
FLOATING	0.0029	0.0021	0.0034	0.0041	0.0042	0.0045
	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.006)
FUNGIBLE	−0.0066	−0.0073	−0.0123**	−0.0115**	−0.0123**	−0.0112**
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
DOM_LAW	0.0028**	0.0024	0.0011	0.0026	0.0013	0.0019
	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)
AMG FE	Yes	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	642,957	642,957	366,129	339,168	362,528	366,129
Adj. R^2	.002	.002	.003	.003	.003	.002

Column 1 of this table presents the coefficient estimates of the following regression equation:

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $P_{f,i,t}$ denotes the EUR amount purchased in quarter t (the quarter of issuance) by fund f of bond i, and $ISSUANCE_{i,t}$ denotes the total EUR amount issued of bond i in quarter t. The dependent variable is expressed in percentage points, and $AFF_{f,i,t}$ is an indicator variable that takes the value of 1 if mutual fund f is affiliated with the issuer of bond i at time t and zero otherwise. $X_{f,i,t}$ is a vector of control variables, which are defined in Appendix A. Columns 2–6 contain the coefficient estimates for the following regression:

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 AFF_{f,i,t} \times STRESS_{i,t} + \beta_3 STRESS_{i,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $STRESS_{i,t}$ denotes a variable capturing times of financial stress. In Columns 2 and 3, it is defined as a dummy that takes the value of one in the period after the Lehman bankruptcy (i.e., starting in 2008:Q3), and zero otherwise. In Columns 4–6, the measures of financial stress are the total borrowing from the Eurosystem over total assets (in percentage points), the ratio of nonperforming loans (in percentage points), and the change in the issuer's average credit rating over the past two quarters (one unit each notch), respectively. Columns 1 and 2 use the full sample, and Columns 3–6 use a sample restricted to trades by issuer-affiliated funds. All regressions include AMG, style, and year-quarter fixed effects, and standard errors, clustered at the AMG level, are given in parentheses. *$p < .1$; **$p < .05$; ***$p < .01$.

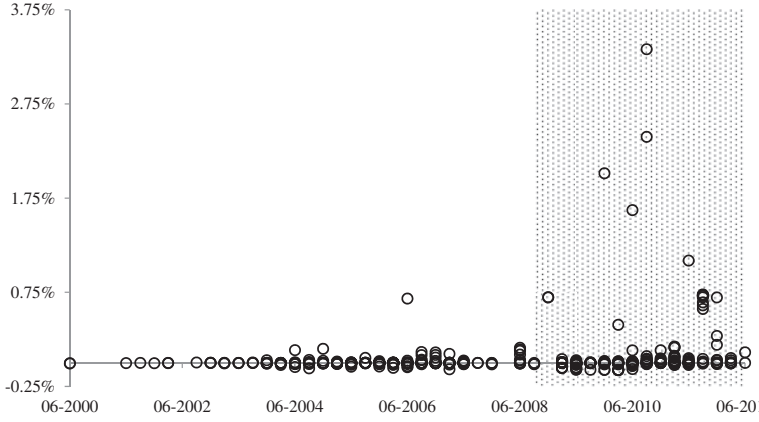

Figure 1
Illustration of funding support over time and across bond issues
This figure plots the difference between the average participation of affiliated and nonaffiliated mutual funds in a particular bond issue over time, normalized by the amount issued. Each circle represents an individual bond issue, and the shaded area marks the post-Lehman period. The vertical axis is truncated for better readability, which leads to the exclusion of one data point.

The coefficient β_2 on the interaction term is positive and significant at the 1% level. This implies that bank-affiliated mutual funds particularly engage in primary market purchases of parent debt in times of tight liquidity and restricted access to wholesale funding sources, namely, when they benefit the most from being able to use an alternative source of funding. The difference between crisis and noncrisis times is also quantitatively important: Funding support by the average fund increases from essentially zero in the pre-Lehman period to 0.09% ($\beta_1 + \beta_2$) of the amount issued in the time after 2008:Q3.

Figure 1 provides an illustration of the evolution of funding support over time. Each circle represents the difference between the average participation of affiliated and nonaffiliated mutual funds in a particular bond issue. The post-Lehman period is marked by the shaded area. The absence of meaningful variation in the pre-event window also serves as validation of the parallel trends assumption underlying the difference-in-difference methodology. The Internet Appendix provides a more formal placebo test.

One potential concern is that bank-affiliated funds are special and invest differently from mutual funds that are never affiliated with any bond issuer. To address this potential concern, we restrict the sample to include only funds that are affiliated to one of the 28 bond issuers. Column 3 reports the results when reestimating Equation (2) using the same definition of $STRESS_{i,t}$ as before. The results are both quantitatively and qualitatively very similar.

Columns 4–6 report the results using the three alternative definitions of $STRESS_{i,t}$ and the restricted sample of only issuer-affiliated funds. Column 4 shows that issuers which borrowed more from the Eurosystem also relied more

on affiliated mutual funds for funding. In Column 5, we find that a higher ratio of nonperforming loans is associated with more funding support from affiliated mutual funds. Finally, the results in Column 6 show that funds participate more in their parents' bond issues if those have recently experienced a rating downgrade.[16]

One possible concern is that funds' decisions to invest in their parent banks' bonds could be determined by reasons that are not captured by the controls. Funds affiliated with a parent bank may have characteristics that make them different from other funds, and bonds issued by their parent bank may also have specific characteristics. Thus, it could be that those unobservable characteristics, and not affiliation, explain funds' preference for their parent banks' bonds. To alleviate this concern about endogenous fund-issuer matching, we show in the Internet Appendix that our results are robust to an alternative specification using issuer-fund fixed effects, which only uses variation from a limited set of funds that switch from affiliated to nonaffiliated or vice versa for a given issuer.

Interestingly, other proxies for the banks' funding structure, their asset structure, and their business model do not explain differences in the use of affiliated funds for funding support. For instance, in the Internet Appendix we show that listed credit institutions, despite their advantage in access to equity funding, do not exhibit higher propensity to use affiliated funds than nonlisted credit institutions. Also, we observe no difference between banks and savings and loans institutions ("cajas"). Finally, differences in funding support can neither be explained by banks' exposure to the real estate sector nor by their holdings of Spanish sovereign bonds or their reliance on wholesale funding.

As mentioned above, to gauge the economic magnitude of total funding support from the asset management division to the parent bank, we aggregate bond purchases across all funds within a given AMG and repeat our analysis.[17] The resultant coefficient estimates in Table 4 show that our conclusions also hold at the AMG level. Moreover, they provide evidence that funding support is also economically significant. From Column 1, we deduce that, on average, bank-affiliated AMGs purchased an additional 2.85% of securities issued by their parent bank, relative to nonaffiliated AMGs. Based on 504 bond issues with an average size of 1,003 billion EUR, this amounts to total funding support of 14.4 billion EUR during our sample period, or around 514 million EUR per bank.

[16] In the Internet Appendix, we show that our results are robust to several alternative definitions of $STRESS_{i,t}$. We also report additional robustness tests related to alternative definitions of funding support and different subsamples.

[17] For this purpose, we construct aggregate fund characteristics as AUM-weighted averages across all funds in the same AMG.

Table 4
Funding support in the primary market: Aggregation at AMG level

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample		Issuer-affiliated funds only			
		Post-Lehman	Post-Lehman	Eurosystem borrowing	NPL ratio	Rating change
AFF	2.8514**	−0.5670**	−0.5330**	2.8976*	−0.1308	2.7124**
	(1.441)	(0.269)	(0.226)	(1.540)	(0.668)	(1.377)
AFF × *STRESS*		7.5854**	7.3867**	1.7454**	1.1858*	1.7947*
		(3.613)	(3.305)	(0.827)	(0.668)	(1.048)
STRESS				−0.0031	−0.2001**	−0.0951
				(0.039)	(0.093)	(0.182)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
AMG FE	Yes	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,078	40,078	12,222	11,228	12,128	12,222
Adj. R^2	.018	.040	.076	.088	.089	.077

Column 1 of this table presents the coefficient estimates of the following regression equation:

$$\frac{P_{g,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{g,i,t} + \delta X_{g,i,t} + \varepsilon_{g,i,t},$$

where $P_{g,i,t}$ denotes the EUR amount purchased in quarter t (the quarter of issuance) by all funds belonging to AMG g of bond issue i, and $ISSUANCE_{i,t}$ denotes the total EUR amount issued of bond i in quarter t. The dependent variable is expressed in percentage points, and $AFF_{g,i,t}$ is an indicator variable that takes the value of 1 if AMG g is affiliated with the issuer of bond i at time t and zero otherwise. $X_{g,i,t}$ is a vector of control variables aggregated at the AMG level. Appendix A defines the variables. Columns 2–6 contain the coefficient estimates for the following regression:

$$\frac{P_{g,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{g,i,t} + \beta_2 AFF_{g,i,t} \times STRESS_{i,t} + \beta_3 STRESS_{i,t} + \delta X_{g,i,t} + \varepsilon_{g,i,t},$$

where $STRESS_{i,t}$ denotes a variable capturing times of financial stress. In Columns 2 and 3, it is defined as a dummy that takes the value of one in the period after the Lehman bankruptcy (i.e., starting in 2008:Q3), and zero otherwise. In Columns 4–6, the measures of financial stress are the total borrowing from the Eurosystem over total assets (in percentage points), the ratio of nonperforming loans (in percentage points), and the change in the issuer's average credit rating over the past two quarters (one unit each notch), respectively. Columns 1 and 2 use the full sample, and Columns 3–6 use a sample restricted to trades by issuer-affiliated funds. All regressions include AMG, style, and year-quarter fixed effects, and standard errors, clustered at the AMG level, are given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

Moreover, in line with the fund-level analysis, the results in Columns 2 and 3 show that most of the funding support was provided in times of financial distress. On average, affiliated AMGs purchased an additional 7% (using the post-Lehman dummy) of each bond issue. Based on 226 bond issues with an average size of 750 million EUR, this amounts to total funding support of 11.9 billion EUR during the post-Lehman period, or 83% of total funding support during the whole sample period.

Notice that the dependent variable takes a value of zero whenever a fund does not participate in a bond issue, which happens very frequently.[18] It is thus natural

[18] As detailed in the Internet Appendix, we observe a total of 9,541 primary market purchases (nonzero observations). Because our regression framework contains lagged control variables, the effective number of nonzero observations is slightly lower at 9,292.

to ask to what extent our results are driven by the extensive or the intensive margin. Do affiliated funds simply participate more often in bond issues, or do they rather purchase larger amounts? We shed light on this question by running two additional regressions. The first specification looks at the extensive margin and is a linear probability model, where we replace the dependent variable with an indicator variable equal to one in case the respective fund engages in a purchase, regardless of the amount, and zero otherwise. In the second specification, we look at the intensive margin by simply dropping all observations where the dependent variable is equal to zero, meaning we analyze amounts conditional on a purchase having taken place. For brevity, we focus on the full sample using the post Lehman dummy (henceforth denoted $POST_t$) as measure of stress.

The results in Table 5 indicate that funding support mainly occurs via the extensive margin. The probability of primary market purchases in crisis times is around 3 percentage points higher for an affiliated fund than for a fund not affiliated with the bond's issuer (Column 2). However, there is no significant difference between the amounts purchased by affiliated and nonaffiliated funds conditional on participating in the issuance (Column 3).

Parent banks are likely to always benefit from funding support. However, the benefits from funding support are plausibly larger for subordinated debt than for senior debt, particularly in times of stress. To explore this possibility, we reestimate Equations (1) and (2) separately for senior and subordinated bond purchases. The estimated coefficients in Table 6 confirm our expectation that, other things equal, affiliated funds concentrate their funding support in riskier instruments. Columns 5 and 6 reveal that this is particularly the case in crisis times, where they purchase 3 times as much subordinated debt than senior debt. This result further suggests that banks strategically resort to affiliated funds' support in the times and circumstances in which it is most valuable to them.

Funding support through bond purchases is particularly valuable because long-term liquidity is more difficult to obtain in crisis times. However, it can in principle also occur through other debt instruments or nondebt liabilities. We investigate this possibility by analyzing funds' investments into Spanish banks' short-term paper (so-called "Pagarés"), deposits, preferred shares ("preferentes"), and seasoned equity issues.

We closely follow our methodology for the analysis of bond purchases. The Internet Appendix reports the detailed results. We find that bank-affiliated mutual funds also provided funding support via short-term paper and deposits. In particular the latter is quantitatively important, amounting to a total of 10.1 billion EUR in the period from 2008:Q4 to 2012:Q2. In contrast, we find no evidence of funding support through purchases of preferred shares, which Spanish banks were able to place directly with retail clients (see Santos 2017), or through purchases of seasoned equity offerings.

Table 5
Funding support in the primary market: Extensive versus intensive margin

	(1)	(2) Full sample	(3)
	Baseline	Extensive Margin	Intensive Margin
AFF	−0.0018	−0.0005	0.0667
	(0.002)	(0.003)	(0.275)
AFF × *POST*	0.0952***	0.0293***	0.1351
	(0.034)	(0.005)	(0.566)
Control variables	Yes	Yes	Yes
AMG FE	Yes	Yes	Yes
Style FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	642,957	642,957	9,292
Adj. R^2	.002	.016	.201

This table separately analyses funding support at the intensive and extensive margin. For comparison, Column 1 duplicates the baseline results from Column 2 in Tables 3. Column 2 presents the coefficient estimates for the following regression:

$$D_{f,i,t} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 AFF_{f,i,t} \times POST_t + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $D_{f,i,t}$ is a dummy variable equal to one if fund f participated in the issuance of bond i in quarter t, and zero otherwise. $POST_t$ is a dummy variable that takes the value of one in the period after the Lehman bankruptcy (i.e., starting in 2008:Q3), and zero otherwise, and $AFF_{f,i,t}$ is an indicator variable that takes the value of 1 if mutual fund f is affiliated with the issuer of bond i at time t and zero otherwise. $X_{f,i,t}$ is a vector of control variables, which are defined in Appendix A. Column 3 presents the coefficient estimates for the following regression:

$$\frac{P_{f,i,t} | P_{f,i,t} > 0}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 AFF_{f,i,t} \times POST_t + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $P_{f,i,t} | P_{f,i,t} > 0$ denotes the EUR amount purchased in quarter t (the quarter of issuance) by fund f of bond i conditional on the amount being positive. $ISSUANCE_{i,t}$ denotes the total EUR amount issued of bond i in quarter t. The dependent variable is expressed in percentage points. All regressions include AMG, style, and year-quarter fixed effects, and standard errors, clustered at the AMG level, are given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

3.2 Price support in the secondary bond market

Besides funding support in the primary market, banks can also encourage affiliated funds to trade in the secondary market in order to reduce yields (and thus financing costs) around the time of new issues. However, this constitutes only indirect support, as the proceeds accrue to the seller, not the issuer. Moreover, there is no guarantee that outright purchases will be successful in reducing yields, partly because European corporate bonds markets tend to be very opaque and illiquid.[19] In any case, the reduced attractiveness of secondary market purchases is ultimately an open empirical question. We address this question by studying changes in bond holdings between consecutive quarters,

[19] According to a recent survey by the Association for Financial Markets in Europe, 63.8% of the corporate bonds and 82.2% of the covered bonds investigated traded less than 20 times per month in the period from July 2010 to June 2011. Generally, corporate bond markets tend to be rather illiquid because standardization is low (Oehmke and Zawadowski 2017), and many bond investors, such as pension funds and insurance companies, tend to follow buy-and-hold strategies (Biais et al. 2006). Moreover, these effects are amplified by the fact that, unlike the United States, Europe does not have mandatory transaction reporting.

Table 6
Funding support in the primary market: Senior versus subordinated bonds

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample					
	Baseline	Senior bonds	Subord. bonds	Baseline	Senior bonds	Subord. bonds
AFF	0.0418**	0.0224**	0.0601*	−0.0018	−0.0022	−0.0036
	(0.019)	(0.009)	(0.036)	(0.002)	(0.002)	(0.006)
AFF × *POST*				0.0952***	0.0524***	0.1440**
				(0.034)	(0.018)	(0.073)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
AMG FE	Yes	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	642,957	346,101	296,856	642,957	346,101	296,856
Adj. R^2	.002	.002	.002	.002	.002	.002

Columns 1–3 of this table present the coefficient estimates of the following regression equation:

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $P_{f,i,t}$ denotes the EUR amount purchased in quarter t (the quarter of issuance) by fund f of bond i, $ISSUANCE_{i,t}$ denotes the total EUR amount issued of bond i in quarter t. The dependent variable is expressed in percentage points and $AFF_{f,i,t}$ is an indicator variable that takes the value of 1 if mutual fund f is affiliated with the issuer of bond i at time t and zero otherwise. $X_{f,i,t}$ is a vector of control variables, which are defined in Appendix A. Column 1 contains the results obtained for all bonds, and Columns 2 and 3 refer to the subsamples of senior and subordinated bonds, respectively. Columns 3–6 contain the coefficient estimates for the following regression:

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 AFF_{f,i,t} \times POST_{i,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $POST_t$ is a dummy that takes the value of one in the period after the Lehman bankruptcy (i.e. starting in 2008:Q3), and zero otherwise. Column 4 contains the results for all bonds, and Columns 5 and 6 refer to the subsamples of senior and subordinated bonds, respectively. All regressions include AMG, style, and year-quarter fixed effects, and standard errors, clustered at the AMG level, are given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

excluding bond-quarter observations corresponding to the quarter of issuance and maturity. For simplicity, we aggregate funds' trading activity in a given quarter across all outstanding bonds from the same issuer.[20] Adapting our previous methodology, we estimate

$$\frac{\Delta H_{f,b,t}}{OUTS_{b,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,b,t} + \beta_2 AFF_{f,b,t} \times STRESS_{b,t} + \beta_3 STRESS_{b,t} + \delta X_{f,b,t} + \varepsilon_{f,b,t}, \quad (3)$$

where $\Delta H_{f,b,t}$ denotes the quarterly change in fund f's holdings of bonds issued by bank b and $OUTS_{b,t}$ denotes the principal amount of the bank's outstanding bonds in quarter t. While we employ the same fund-level characteristics as before, $X_{f,b,t}$ does not include bond-level characteristics due to our aggregation at the issuer level. However, we additionally control for the log of the total amount outstanding for bank b at time t.

[20] The results are qualitatively similar if we conduct the analysis at the bond level.

Table 7
Funding support in the secondary market

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample		Issuer-affiliated funds only			
		Post-Lehman	Post-Lehman	Eurosystem borrowing	NPL ratio	Rating change
AFF	0.0001	−0.0004*	−0.0005	0.0002	−0.0004	−0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
AFF × *STRESS*		0.0009	0.0011	0.0002	0.0002	0.0010
		(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
STRESS				0.0000	0.0005	−0.0027
				(0.000)	(0.000)	(0.002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
AMG FE	Yes	Yes	Yes	Yes	Yes	Yes
Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	942,901	942,901	525,758	505,715	518,563	546,800
Adj. R^2	.000	.000	.000	.000	.000	.000

This table contains the coefficient estimates for the following regression equations:

$$\frac{\Delta H_{f,b,t}}{OUTS_{b,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,b,t} + \beta_2 AFF_{f,b,t} \times STRESS_{b,t} + \beta_3 STRESS_{b,t} + \delta X_{f,b,t} + \varepsilon_{f,b,t},$$

where $\Delta H_{f,b,t}$ denotes the quarterly change in fund f's holdings of bonds issued by bank b, and $OUTS_{b,t}$ denotes the principal amount of the bank's outstanding bonds in quarter t. The dependent variable is expressed in percentage points; $AFF_{f,b,t}$ is an indicator variable that takes the value of 1 if mutual fund f is affiliated with bank b at time t and zero otherwise; and $X_{f,b,t}$ is a vector of control variables, which are defined in Appendix A. $STRESS_{b,t}$ denotes a variable capturing times of financial stress. In Columns 2 and 3, it is defined as a dummy that takes the value of one in the period after the Lehman bankruptcy (i.e., starting in 2008:Q3), and zero otherwise. In Columns 4–6, the measures of financial stress are the total borrowing from the Eurosystem over total assets (in percentage points), the ratio of nonperforming loans (in percentage points), and the change in the issuer's average credit rating over the past two quarters (one unit each notch), respectively. Columns 1 and 2 use the full sample, and Columns 3–6 use a sample restricted to trades by issuer-affiliated funds. All regressions include AMG, style, and year-quarter fixed effects, and standard errors, clustered at the AMG level, are given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

Table 7 contains the regression results, where Column 1 corresponds to the specification without the interaction term, and Columns 2 and 3 include the interaction term with the post-Lehman dummy for the full sample and the sample restricted issuer-affiliated funds, respectively. In Columns 4–6, we use the three other definitions of $STRESS_{b,t}$. In all cases, we find no evidence for price support through secondary market purchases, neither in normal times nor in times of financial distress. These results corroborate our prior that funding support occurs in the primary market.

4. Cost for Mutual Fund Investors

The results in the previous section suggest that bank-affiliated funds tend to buy debt of the parent institution in times of financial turmoil. However, whether funding support is costly to affiliated mutual fund investors is an empirical question. For instance, it is possible that this excess investment is the result of insider information concerning the true financial health of the parent

company.[21] If affiliated funds have the ability to detect whether a bond issued by its parent bank is mispriced, they will purchase underpriced bonds in the primary market and shun overpriced bonds. However, as private information disseminates, prices should converge to fundamental values. Therefore, we would expect to observe positive short-term risk-adjusted returns among those bonds that affiliated funds choose to purchase in the primary market and zero or negative risk-adjusted returns among bonds avoided by affiliated funds. On the other hand, if affiliated funds have no informational advantage, we would expect no return differences between bonds purchased and comparable bonds avoided by affiliated funds. Finally, if purchases of affiliated funds contribute to inflating bond prices at issuance, then we would expect to observe negative short-term risk-adjusted returns among those that affiliated funds choose to purchase in the primary market. To test whether affiliated fund participation in bond issuances is associated with bond mispricing, we compare abnormal bond returns following the issuance date for bonds with and without affiliated fund participation.

Computing abnormal returns is a challenging task because sector indices at the European level constitute poor benchmarks due to the high degree of financial fragmentation during the most intense crisis episodes. Accordingly, we construct our own benchmark for Spanish bank bonds. We collect daily bond returns from Datastream and the history of security ratings from the three major ratings agencies (S&P, Moody's, and Fitch). We then compute the abnormal return (in percentage points) for bond i issued by bank b on day t, denoted $AR_{i,b,t}$, as the bond's total return minus the average total return of all Spanish bank bonds in the same rating category R and maturity category M.[22] To mitigate the effects of outliers, we winsorize bond returns at the 1st and the 99th percentile and require the benchmark portfolios to consist of at least five securities in a given quarter. Due to the low liquidity in the European corporate bond market, we are only able to construct abnormal returns for 187 of our 504 bond issues. Based on these data, we compute the return on the day of the issuance (1-day abnormal return), as well as 1-week and 1-month cumulative abnormal returns.

We then regress these returns on an indicator variable, $AFF\_PURCHASE_{i,b,t}$, that is equal to one if any fund affiliated with the issuer of bond i purchased the bond in the primary market, and zero otherwise. We also include issuer fixed effects (μ_b) in the regression to control for any time-invariant issuer

[21] Massa and Rehman (2008) provide evidence of such information flows for U.S. financial conglomerates and show that the associated trades generate positive abnormal performance for fund investors. On the other hand, Golez and Marin (2015) find no association between affiliated mutual fund trades in parent banks' stocks and subsequent stock returns. Ferreira, Matos, and Pires (2018) find that purchases of the banks' clients' stock actually hamper mutual fund performance.

[22] We set M = {<5y, 5-10y, >10y} and R = {AAA, AA, A, BBB}. For securities with multiple ratings, we use the best score across the three major rating agencies at given point in time. Total returns are directly provided by Datastream.

Table 8
Post-issuance abnormal returns

	(1)	(2)	(3)	(4)	(5)	(6)
	1-day abnormal return		1-week abnormal return		1-month abnormal return	
AFF_PURCHASE	−0.2929***	−0.0941	−0.3256***	0.0219	−0.4426**	−0.0614
	(0.068)	(0.054)	(0.086)	(0.132)	(0.179)	(0.146)
POST		−0.0473		0.0574		0.1399
		(0.089)		(0.135)		(0.300)
POST × *AFF_PURCHASE*		−0.2347**		−0.5039**		−0.6042
		(0.093)		(0.189)		(0.403)
Estimated abnormal return in crisis times		−0.3761***		−0.4246**		−0.5257**
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	187	187	187	187	187	187
Adj. R^2	.028	.031	.020	.031	.017	.018

This table presents the coefficient estimates from the following linear regression:

$$AR_{i,b,t} = \mu_b + \mu_1 AFF\_PURCHASE_{i,b,t} + \mu_2 POST_t + \mu_3 POST_t \times AFF\_PURCHASE_{i,b,t} + \zeta_{i,b,t}$$

where $AR_{i,b,t}$ denotes the abnormal return (in percentage points) on bond i from issuer b on the issuance date (Columns 1 and 2), the cumulative abnormal return during the bond's first week after issuance (Columns 3 and 4), or the cumulative abnormal return during the bond's first month after issuance (Columns 5 and 6). Abnormal returns are computed relative to other Spanish banks bonds from the same maturity and ratings category. See Section 4 for details. $AFF\_PURCHASE_{i,b,t}$ is a dummy variable equal to one if at least one mutual fund affiliated with the issuer of bond i has purchased the bond in the primary market, and zero otherwise. $POST_t$ is defined as a dummy that takes the value of one in the period after the Lehman bankruptcy (i.e., starting in 2008:Q3), and zero otherwise. The row "Estimated abnormal returns in crisis times" gives the estimated abnormal returns in crisis times for bonds purchased by affiliated funds, that is, the fitted values for $AFF\_PURCHASE_{i,b,t} = 1$ and $POST_t = 1$, respectively. All regressions include issuer fixed effects, and standard errors, clustered at the issuer level, are given in parentheses. * $p < .1$; ** $p < .05$; *** $p < .01$.

characteristic that may affect bond returns.

$$AR_{i,b,t} = \mu_b + \mu_1 AFF\_PURCHASE_{i,b,t} + \zeta_{i,b,t}. \quad (4)$$

The results for different time horizons are tabulated in Columns 1, 3, and 5 of Table 8, where standard errors are clustered at the AMG level. The estimated coefficient on $AFF\_PURCHASE_{i,b,t}$ is negative and statistically significant at all three horizons. Therefore, bond issuances where affiliated funds participate, not only fail to outperform those in which affiliated funds choose not to participate, but underperform by between 29 bp (on the day of issuance) and 44 bp (cumulative over 1 month). This evidence provides further credence to the idea that affiliated fund purchases are aimed at providing funding to the parent bank at better-than-market conditions.

We then augment the regression with the post-Lehman dummy and its interaction with $AFF\_PURCHASE_{i,b,t}$ to determine whether the observed overpricing is concentrated in crisis times:

$$AR_{i,b,t} = \mu_b + \mu_1 AFF\_PURCHASE_{i,b,t} + \mu_2 POST_t + \mu_3 POST_t \times AFF\_PURCHASE_{i,b,t} + \zeta_{i,b,t}. \quad (5)$$

At 1-day and 1-week horizons, we find that most of the return differential between bond issuances with and without affiliated fund participation indeed realizes during times of financial stress, with the coefficient on the interaction term being large and statistically significant in 2 of the 3 cases. Given the reduced sample, the lack of significance at the 1-month horizon may be due to a lack of power. Based on the regression coefficients, Table 8 also reports the average abnormal returns of bonds purchased by affiliated funds in crisis times ($\mu_1+\mu_2+\mu_3$). These estimated abnormal returns are always negative and statistically significant. In sum, we conclude that the data suggest that bank bonds are overpriced in the primary market when affiliated mutual funds participate at the issuance stage.

Evidence of bond overpricing suggests that banks that use their affiliated funds for funding support enjoy better conditions when issuing debt. In the Internet Appendix, we take the point of view of mutual fund investors and study the performance of purchases of parent bank debt in the primary market relative to that of simultaneous trades in other bank bonds with similar characteristics. This approach allows to evaluate the benefit or cost of funding support to mutual funds. Our results suggest that purchases of parent bank bonds in the primary market underperform purchases of nonaffiliated bank bonds by more than 90 bp during the crisis period.

In the Internet Appendix, we also study whether affiliated funds tendency to hold deposits with their parent banks is justified by higher interest rates on their investment. We find, instead, that deposit rates are significantly lower when funds are affiliated with the bank. This negative spread constitutes a direct transfer from mutual fund investors to the parent institution, as the bank precisely saves the interest rates forgone by the investors.

In sum, we find no evidence that funding support to parent banks is motivated by valuable insider information. To the contrary, the empirical evidence suggests that these investments earn negative abnormal returns at the expense of fund investors.

5. Strategic Selection of Mutual Funds for Funding Support

The fact that mutual funds overpay for their parent banks' bonds and earn lower deposit rates implies that funding support is costly for investors, but provides a direct benefit to the bank. A different question is whether and how the asset management firm is affected. Funding support to the parent bank could harm an asset management firm through at least two channels. First, the mutual fund literature has consistently shown that investors chase past performance (e.g., Sirri and Tufano 1998). Because the majority of funds charges a management fee as a fraction of AUM, funding support can hurt future fee revenues indirectly through lower asset growth. Second, some mutual funds charge a performance fee, which is calculated as a fraction of (positive) portfolio returns. In this case, lower returns due to funding support negatively affect fee revenues for the management firm.[23]

We start by studying how Spanish bond fund investors respond to past fund performance. The literature suggests that funds that cater to retail investors are subject to less monitoring and screening (Del Guercio and Tkac 2002; Evans and Fahlenbrach 2012). If that is true in the Spanish market, we would expect flows to exhibit more sensitivity to fund performance when they are targeted to institutional investors.

To explore this possibility, we define a dummy for retail funds, $RETAIL_f$, equal to one for funds whose average AUM per shareholder is below the 75th percentile (approximately 50,000 EUR) in the cross-section of funds for every quarter, and zero otherwise.[24] To measure fund performance, we use the fund's return in excess of the 3-month Spanish Treasury bill. Fund growth due to inflows of new money is computed as $\frac{FLOW_{f,t}}{AUM_{f,t-1}}$, where $FLOW_{f,t}$ denotes the flow in euros to fund f in quarter t. Importantly, we directly observe flows and do not need to calculate them. Then, we estimate the regression

$$\frac{FLOW_{f,t}}{AUM_{f,t-1}} = \theta_{AMG} + \theta_S + \theta_t + \theta_1 PERF_{f,t-1} + \theta_2 PERF_{f,t-1} \times RETAIL_f + \theta_3 RETAIL_f + \theta_4 X_{f,t-1} + \xi_{f,t}. \quad (6)$$

[23] In addition, reputational loss due to unethical or illegal behavior can damage business in the long run. However, this effect is difficult to measure.

[24] We obtain qualitatively similar results if we increase the cutoff to the 90th percentile or directly use the average AUM per shareholder (obviously yielding coefficients with the opposite sign).

Table 9
Flow-performance relationship

	(1)	(2)
	Performance over 3M Treasury bill	
PERF	0.3798***	0.5476***
	(0.059)	(0.082)
PERF x RETAIL		−0.3005***
		(0.088)
RETAIL	−0.3666	−0.4355
	(0.322)	(0.325)
PERF + PERF x RETAIL		0.247***
		(0.053)
Control variables	Yes	Yes
AMG FE	Yes	Yes
Style FE	Yes	Yes
Time FE	Yes	Yes
Observations	51,200	51,200
Adj. R^2	.085	.086

This table contains the coefficient estimates from the following regression equation:

$$\frac{FLOW_{f,t}}{AUM_{f,t-1}} = \theta_{AMG} + \theta_S + \theta_t + \theta_1 PERF_{f,t-1} + \theta_2 PERF_{f,t-1} \times RETAIL_f + \theta_3 RETAIL_f + \theta_4 X_{f,t-1} + \xi_{f,t},$$

where $FLOW_{f,t}$ measures the flow in or out of fund f in quarter t, $AUM_{f,t-1}$ denotes lagged fund size, $PERF_{f,t-1}$ denotes lagged fund performance, and $RETAIL_f$ is a dummy variable equal to one for retail funds (defined as funds that are in the lower 75th percentile of the cross-sectional distribution of *AUM* per shareholder during every quarter; see Appendix A). $X_{f,t-1}$ is a vector of lagged control variables, which are defined in Appendix A. The dependent variable is expressed in percentage units. Fund performance is defined as the return in excess of the 3-month Spanish Treasury bill (in percentage points). In the row immediately after the regression coefficients of Column 2, we report a linear combination of several coefficients and the associated standard error (in parentheses). All regressions include AMG, style, and year-quarter fixed effects. Standard errors are clustered at the AMG level and given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

where $PERF_{f,t-1}$ denotes lagged fund performance and $X_{f,t-1}$ is a vector of lagged control variables containing fund return volatility, fund flows, portfolio turnover, fund age, fund fees, (log) AUM, and (log) AMG's AUM. We also include investment style (θ_S), quarter (θ_t), and AMG (θ_{AMG}) fixed effects.

Column 1 of Table 9 contains the coefficient estimates for a model specification that includes $RETAIL_f$, but not its interaction with lagged performance. Standard errors are clustered at the AMG level and the dependent variable is expressed in percentage points. Consistent with the literature on mutual fund flows, the estimated coefficient on lagged performance is positive and highly significant. This association is also economically significant: A 1% increase in the fund's excess return is followed by inflows corresponding to 38 bp of AUM. Therefore, asset management companies have incentives to mitigate the negative impact of funding their parent bank.

In Column 2 we estimate the full specification (6) and find that the coefficient on the interaction term, θ_2, is negative and significant at the 1% level, which confirms our prior that retail investors are less sensitive to fund performance.

Moreover, the economic magnitude of the difference in flow-performance sensitivity between retail and institutional funds is considerable: flows to institutional funds are twice as sensitive to performance as flows to retail funds ($\theta_1 = 0.5476, \theta_1 + \theta_2 = 0.247$).

In the Internet Appendix, we follow Sirri and Tufano (1998) and allow for the possibility of a nonlinear flow-performance relationship.[25] We show that the flow-performance relationship for retail funds is not only flatter than for institutional funds but also more linear. More specifically, managers of retail funds are rewarded less for performance, particularly for outstanding performance, than managers with institutional clients.

Based on these findings, we hypothesize that funding support is more prevalent in retail funds and funds that do not charge a performance fee. To test this hypothesis, we augment Equation (1) and estimate

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_S + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 FUND\_CHARACTERISTIC_{f,t} + \beta_3 AFF_{f,i,t} \times FUND\_CHARACTERISTIC_{f,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t}, \quad (7)$$

where $FUND\_CHARACTERISTIC_{f,t}$ is either the $RETAIL_f$ dummy or $PERF\_FEES_{f,t}$, an indicator variable for the presence of a performance fee. Table 10 contains the regression results for both specifications. The coefficient on $AFF_{f,i,t}$ in Column 1 is positive and significant, which suggests that institutional funds are also used to provide funding support. However, the coefficient on the interaction term $AFF_{f,i,t} \times RETAIL_f$ is positive and statistically significant, which provides support to our hypothesis. The economic magnitude of the difference is also significant. While affiliated institutional funds purchase 0.04% of their parent banks' bond issues more than nonaffiliated institutional funds, the excess participation of affiliated retail funds is roughly twice as large at 0.08% ($\beta_1 + \beta_3$).

In Column 2, we find supporting evidence for our hypothesis that funds that charge a performance fee provide less funding support to their parent banks. Around 10% of the funds in our sample charge performance fees. Such funds have an excess participation in their parent banks' bond issues of a statistically insignificant 0.004% ($\beta_1 + \beta_3$), as opposed to a statistically significant 0.04% for funds without a performance fee.

In sum, the results of this section complement the previous findings by confirming that banks not only receive support from their affiliated funds when the benefits are higher, but also strategically allocate the burden of support to funds for which the impact of poor performance is lower.

[25] Starting with Sirri and Tufano (1998), several authors have documented a nonlinear flow-performance relationship in U.S. equity funds. Ferreira et al. (2012) study a large sample of equity mutual funds domiciled in 28 countries and find a similarly convex relationship in most countries, including in Spain. In contrast, Goldstein, Jiang, and Ng (2017) document a concave flow-performance relationship for U.S. corporate bond funds.

Table 10
Funding support in the primary market and the role fund characteristics

	(1)	(2)
AFF	0.0413***	0.0438**
	(0.015)	(0.020)
RETAIL	−0.0019	
	(0.001)	
AFF × *RETAIL*	0.0362**	
	(0.018)	
PERF_FEES		−0.0036*
		(0.002)
AFF × *PERF_FEES*		−0.0394*
		(0.021)
Control variables	Yes	Yes
AMG FE	Yes	Yes
Style FE	Yes	Yes
Time FE	Yes	Yes
Observations	642,957	642,957
Adj. R^2	.002	.002

This table contains the coefficient estimates of the following regression equation:

$$\frac{P_{f,i,t}}{ISSUANCE_{i,t}} = \alpha_{AMG} + \alpha_{St} + \alpha_t + \beta_1 AFF_{f,i,t} + \beta_2 FUND\_CHARACTERISTICS_{f,t}$$

$$+ \beta_3 AFF_{f,i,t} \times FUND\_CHARACTERISTIC_{f,t} + \delta X_{f,i,t} + \varepsilon_{f,i,t},$$

where $P_{f,i,t}$ denotes the EUR amount purchased in quarter t (the quarter of issuance) by fund f of bond issue i, and $ISSUANCE_{i,t}$ denotes the total EUR amount issued of bond i in quarter t. The dependent variable is expressed in percentage points, and $AFF_{f,i,t}$ is an indicator variable that takes the value of 1 if mutual fund f is affiliated with the issuer of bond i at time t and zero otherwise. $FUND\_CHARACTERISTIC_{f,t}$ denotes the fund characteristics of interest that is interacted with the dummy $AFF_{f,i,t}$. In Column 1 the characteristic of interest is denoted as $RETAIL_f$ and corresponds to a dummy variable equal to one for retail funds (defined as funds that are in the lower 75th percentile of the cross-sectional distribution of *AUM* per shareholder during every quarter; see Appendix A). In Column 2 we use $PERF\_FEES_{f,t}$, which is a dummy variable equal to one if the fund has performance fees. All regressions include AMG, style, and year-quarter fixed effects, and standard errors, clustered at the AMG level, are given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

6. Consequences for Credit Supply

Banking crises can severely reduce credit supply, which in turn can have negative real effects on employment and investment. This is particularly true for bank-based economies like Spain.[26] If support from affiliated funds helps banks weather periods of funding stress, it may also mitigate negative shocks to credit supply. To explore this question, we investigate whether nonfinancial firms experience less credit rationing from banks that receive more funding support from affiliated funds. More specifically, we regress credit growth at the bank-firm level over the 2008:Q4–2012:Q2 period on a measure of funding support, other bank characteristics, and firm fixed effects. The latter allow us to control for credit demand by comparing lending by multiple banks to the same firm (as in Khwaja and Mian 2008).

[26] According to Bentolila, Jansen, and Jiménez (2018), loans from credit institutions accounted for 86% of gross domestic product in Spain and 62% in the European Union.

We rely on loan-level data from the Central Credit Register of the Bank of Spain. The data set contains information on all loans granted to nonfinancial institutions above 6,000 euros. We aggregate loan amounts at the firm-bank level and estimate the following cross-sectional credit growth equation:

$$\log\left(1+\text{Credit}_{c,b,2012Q2}\right)-\log\left(1+\text{Credit}_{c,b,2008Q4}\right)=\lambda_c+\lambda_1 AP_b+\lambda_2 X_b+\nu_{c,b}, \quad (8)$$

where $Credit_{c,b,2012Q2}$ and $Credit_{c,b,2008Q4}$ denote the total amount of credit (in thousands of euros) committed by bank b to firm c, both drawn and undrawn, on June 2012 and December 2008, respectively.[27] The variable AP_b denotes to the total amount of bonds purchased by funds affiliated with bank b during the same period. We consider four different definitions of AP_b: bonds purchased relative to total assets (*MF_bonds/TA*); bonds purchased relative to equity (*MF_bonds/Eq*); bonds purchased relative to the AUM of affiliated funds (*MF_bonds/AUM*); and the logarithm of the amount purchased by affiliated funds (*log(1+MF_bonds)*). X_b is a vector of bank-level controls, and λ_c are firm fixed effects.[28]

Table 11 reports the results. The coefficient of interest, λ_1 is positive and statistically significant for all four definitions of *AP*. These results are consistent with the hypothesis that affiliated funding support helped mitigate credit rationing. A 1-standard-deviation increase in affiliated purchases (Columns 1–3) is associated with an increase in credit growth between 6.5% and 7%. This is a remarkable figure given that the median firm experienced a reduction in credit of around 40%. Using the logarithm of the total amount of affiliated purchases (Column 4), the economic magnitude is even higher.

Note that the decision to purchase parent debt is endogenous, so we cannot provide a causal interpretation of the strong association between funding support and credit growth. Instead, we take the results in Table 11 as suggestive that the ability to raise funds from mutual funds under the bank's control can be an effective means of reducing credit rationing and the resultant negative consequences for both banks and the nonfinancial sector.

7. Conclusions

In this paper, we have unveiled a novel channel for conflicts of interest in financial conglomerates, namely the provision of funding support to the parent

[27] Recent papers studying the real effects of credit supply shocks by exploiting cross-sectional differences in lender characteristics include Greenstone, Mas, and Nguyen (2019), Chodorow-Reich (2014), and Bentolila, Jansen, and Jiménez (2018). In fact, Bentolila, Jansen, and Jiménez (2018) also use a 4-year time interval (2006–2010) in their cross-sectional regression.

[28] The control variables are total bond issuance (in logs) from December 2008 to June 2012, profitability (return on assets), size (logarithm of total assets), leverage (equity over total assets), NPL ratio, loans over deposits, borrowing from the Eurosystem, credit to real estate and construction sectors over total assets, and share of liquid assets.

Table 11
Mutual funding and credit supply

	(1) MF_bonds / TA	(2) MF_bonds / Eq	(3) MF_bonds / AUM	(4) log (1+MF_bonds)
AP	50.0857***	2.3463***	2.4626***	0.0386***
	(5.948)	(0.294)	(0.263)	(0.002)
Bank characteristics	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	864,563	864,563	864,563	864,563
Adj. R^2	.253	.253	.253	.254

This table presents the coefficient estimates of the following regression equation:

$$\log\left(1+Credit_{c,b,2012Q2}\right)-\log\left(1+Credit_{c,b,2008Q4}\right)=\lambda_c+\lambda_1 AP_b+\lambda_2 X_b+\nu_{c,b},$$

where $\text{Credit}_{c,b,2012Q2}$ and $\text{Credit}_{c,b,2008Q4}$ denote the total credit committed (in thousands of euros) by bank b to firm c, both drawn and undrawn, at June 2012 and December 2008, respectively. The variable *AP* (Affiliated Purchases) denotes the total purchases of bank b's securities by its affiliated funds. Each column of the table refers to a different definition of *AP*: the amount of bonds purchased relative to total assets (*MF_bonds/TA*) in Column 1; the amount of bonds purchased relative to equity (*MF_bonds/Eq*) in Column 2; the amount of bonds purchased relative to the AUM by affiliated funds (*MF_bonds/AUM*) in Column 3; and the logarithm of the amount of bonds purchased *log((1+MF_bonds))* in Column 4. X_b is a vector of bank-level controls including the total amount of bonds issued from December 2008 to June 2012 (in logs), as well as bank characteristics as of December 2008: profitability (return on assets), size (logarithm of total assets), leverage (equity over total assets), NPL ratio, loans over deposits, borrowing from the Eurosystem, credit to real estate and construction sectors over total assets, and share of liquid assets.λ_c denotes firm fixed effects. Standard errors are robust to heteroscedasticity and are given in parentheses. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

company. Using Spanish data, we show that bank-affiliated funds purchase more of their parents' bond issues in the primary market than nonaffiliated funds. Further evidence supports the notion that banks strategically resort to this unconventional source of funding when access to traditional funding is limited and costly. In particular, banks use their affiliated mutual funds for funding in times of crisis, when they are forced to borrow from the Eurosystem, when the fraction of nonperforming loans is higher, and when their credit rating deteriorates.

Importantly, we show that funding support is associated with bond overpricing, so it benefits parent banks at the expense of their affiliated mutual fund investors. Moreover, we find evidence that banks strategically select the mutual funds that support them to minimize the impact.

In contrast to the United States, related-party transactions are not banned as part of the European regulatory framework relating to conflicts of interest in asset management. Instead, regulation relies on the establishment of norms of conduct that prevent conflicts of interest or deal with them in a way that minimizes the impact on investors. Our paper's results suggest that this approach, at least in the way it has been implemented in Spain, may not be effective in protecting mutual fund investors.

But our results also suggest that banks are highly responsive to the costs of abusing conflicts of interest. Therefore, greater investor protection could be achieved by subjecting asset managers to higher potential liabilities associated

with failure to comply with the regulation of related-party transactions. This view is consistent with a recent regulatory change in Spain. New rules of the Spanish Securities and Exchange Commission explicitly define the acquisition of securities issued or guaranteed by related parties as a related-party transaction that requires prior authorization, taking into consideration the conflicts of interest that may be involved. In practice, such requirement forces asset management companies to explicitly declare that a transaction is in the best interest of investors and at a price and conditions that are better or equal to those prevailing in the market, prior to trading.[29] A different way of raising the costs of abusing conflicts of interest is to facilitate investors' monitoring of asset managers' actions. This approach includes enhancing the disclosure of related-party transactions and their potential costs to investors as well as providing investors with tools that facilitate the comparison of fund performance with the fund's benchmark portfolio and/or peers.

Moreover, the results of our paper have two other regulatory implications. First, the fact that we find no funding support through preferred shares is suggestive that the purchase of banks' securities by affiliated funds could be a substitute for the direct sale of securities to retail investors. The natural consequence is that mutual funds should be jointly regulated with other retail financial markets to mitigate the risk that increasing the cost of affiliated funding support leads to more direct sales to retail investors. Second, our results suggest that the availability of funding from affiliated funds might help mitigate the impact of crises on credit supply. But the parent firm or its subsidiaries within a financial conglomerate could in principle also help the clients of the asset management division by providing funding in times of turmoil (Kacperczyk and Schnabl 2013; Franzoni and Giannetti 2019). Therefore, banning within-conglomerate transactions would eliminate the ability of financial conglomerates to offset shocks internally and the associated benefits to investors and the whole system.

Appendix A. Definition of Control Variables

In the following appendix, we define the control variables used throughout the paper.

A.1 Fund-Level Variables

$LOG\_FUND\_AUM_{f,t}$: The natural logarithm of the assets under management of fund f in quarter t

$LOG\_AMG\_AUM_{f,t}$: The natural logarithm of the total sum of assets under management for fund f's asset management group in quarter t

$LAG\_RET_{f,t}$: The return of fund f in quarter t-1

[29] These new rules are contained in the Technical Guide 1/2018 to related-party transactions of collective investment schemes and other transactions of collective investment scheme management companies (https://www.cnmv.es/DocPortal/Legislacion/Guias-Tecnicas/Guiatecnica_2018_1_EN.pdf).

$\frac{FLOW_{f,t}}{AUM_{f,t-1}}$: The fund growth due to inflows of new money, where $FLOW_{f,t}$ denotes the flow in euros to fund f in quarter t and $AUM_{f,t-1}$ denotes the fund f's assets under management in quarter t-1

$FEES_{f,t}$: The total fees charged by fund f in quarter t, following Golez and Marin (2014) and Sirri and Tufano (1998). Total fees are computed as

$$FEES_{f,t} = management_{f,t} + performance_{f,t} + custodian_{f,t}$$

$$+ (upfront + redemption_{f,t} - rebate_{f,t})/7$$

$RETAIL_f$: Dummy variable equal to one if the average AUM per fund shareholder is below the 75th percentile (corresponding to roughly 50,000 EUR) in the cross-section of funds for every quarter, and zero otherwise

For the regression analysis at the fund level (Section 5), which is summarized in Equation (6), we use four additional variables:

$PERF_{f,t-1}$: The return of fund f in quarter t-1 in excess of the average 3-month Spanish Treasury bill that quarter

$LOG\_AGE_{f,t}$: The logarithm of 1 plus the fund age measured in quarters since its registration dates

$TURNOVER_{f,t}$: The total value of purchases (sales) during quarter t by fund f relative to the average total net assets of the fund during the last year ($TNA_{f,t}$). Following the methodology used in the CRSP database, we compute turnover as computed as

$$TURNOVER_{f,t} = \frac{\min(Buys_{f,t}, Sells_{f,t})}{TNA_{f,t}}$$

$FUND\_RET\_VOLA_{f,t}$: The standard deviation of quarterly fund returns over the prior four quarters

For the regression analysis of funding support in the primary market and the role of fund characteristics (Section 5), which is summarized in Equation (7), we use an additional variable:

$PERF\_FEES_{f,t}$: Dummy variable that is equal to one if the fund has performance fees in quarter t

For our analyses at the AMG level (Section 3.1), these variables are aggregated across funds using weighted averages based on assets under management. In this section, we additionally use the following variable:

$LOG\_AMT\_OUTSTANDING_{b,t}$: The natural logarithm of the total principal amount outstanding at time t across all bonds of bank b included in our sample

A.2 Bond Characteristics

$LOG\_ISSUANCE_{i,t}$: The natural logarithm of the total amount issued of bond i in quarter t

$MATURITY_{i,t}$: The residual maturity of bond i at issuance in quarter t (measured in years)

$SECURED_i$: Dummy variable that takes the value of 1 if bond i is collateralized, and 0 otherwise

$CALLABLE_i$: Dummy variable that takes the value of 1 if bond i issued in quarter t is callable and 0 otherwise

$FLOATING_i$: Dummy variable that takes the value of 1 if bond i has a floating rate coupon and 0 otherwise

$FUNGIBLE_i$: Dummy variable that takes the value of 1 if bond i is fungible and 0 otherwise

DOM_LAW_i: Dummy variable that takes the value of 1 if bond i is issued under Spanish law and 0 otherwise

A.3 Bank Characteristics

$EUROSYSTEM_{i,t}$: Outstanding amount borrowed from the Eurosystem by the issuer of bond i in quarter t over total assets in that quarter

$NPL_{i,t}$: Ratio of gross nonperforming loans over total loans for the issuer of bond i.

$\Delta RATING_{i,t}$: Change in the average credit rating of the issuer of bond i, based on the three major rating agencies (S&P, Moody's, and Fitch) over the past two quarters. We first convert credit ratings to an ordinal scale according to the following schedule: 21 for the lowest rating (C) and 1 for the highest rating (AAA). Note that this conversion implies that positive numbers indicate a worsening of the credit rating

Appendix B. Regulation of Related-Party Transactions and Minimum Diversification Limits in Spain

Under Spanish law, asset management companies have the obligation to put in place procedures and internal control mechanisms to identify, monitor, and mitigate conflicts of interest. Accordingly, the firm must detect possible conflicts of interest. If a potential conflict of interest associated with related-party transactions is detected, an independent unit within the conglomerate must verify that the transaction is in the best interest of investors and at prices and conditions that are better than or equal to those prevailing in the market. When conflicts of interest cannot be avoided, the firm must disclose them to investors. Such decisions are ultimately subject to the supervisory authority's ex post scrutiny. We have found only two instances in which the supervisor fined an asset management company for failure to comply with the regulation of related-party transactions. Until February 2018, detection of potential conflicts of interest in related-party transactions was in the hands of the asset management firm itself. Since that date, the Spanish Securities and Exchanges Commission has issued new rules whereby *all* purchases of securities issued by related parties, including deposits, must be authorized by the independent unit prior to the transaction. These rules, in practice, define such related-party transactions as potential conflicts of interest and force the asset management firm to declare explicitly that the transaction is in the best interest of investors and at a price and conditions that are better than or equal to those prevailing in the market, before carrying out the trade.

The European Union Directive regulating undertakings for collective investment in transferable securities (UCITS) establishes that a UCITS cannot invest more than 5% of its assets in transferable securities or money market instruments issued by the same body.[30] (Deposits in a single body are subject to a 20% position limit.) However, the directive also establishes that member states may raise the 5% limit to a maximum of 10%, provided that the total value of the transferable securities and the money market instruments held by the UCITS in the issuing bodies in each of which it invests more than 5% of its assets does not exceed 40% of the value of its assets. This is the so-called "5/10/40 rule." The Spanish Law (Law 35/2003) transposes the European Union Directive and raises the 5% limit to 10% as long the sum of investments in a single issuer that exceed the 5% limit does not account for more than 40% of the portfolio's assets. However, a number of exceptions can be made to the 5/10/40 rule. Most important to our paper, the Spanish Law allows the Implementing Regulation to raise the 5% limit for specific types of securities and funds. Accordingly, the Implementing Regulation grants exemption from the 5% limit to funds whose investment objective is to replicate an equity or fixed income index, provided that the index meets certain conditions. In this case, the limit on investments in securities of a single issuer is raised to 20% of assets under management or 35% under exceptional circumstances to be assessed by the market's supervisor. Under exceptional circumstances, funds benchmarked to an index are also allowed to invest up to 35% of the portfolio in securities issued by a single issuer. Because such national-level regulation does not comply with the European Union Directive, mutual funds that benefit from this exemption are considered non-UCITS.

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