Relationship Lending in Bond Markets? Evidence From Corporate Call Policies*

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Abstract

Can relationship lending be sustained in public financial markets? We use firms' call decisions as a laboratory to study this question. After a fixed-price call forces existing bondholders to sell their bonds back at below market prices, existing bondholders are far less likely to participate in firms' subsequent bond issuances. The effects are strongest for the largest fund families, such that the call leads to a reduction in their total ownership of these firms' bonds. In turn, firms delay calling their bonds when they have more large fund families in their bondholder base. Finally, firms' borrowing costs are affected by the reputation they develop from their past call decisions. Our results reveal the importance of relationship lending in bond markets and show how firms' financial policies affect these relationships.

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1 Introduction

> "[The call] would have resulted in an inconsequential US$12m of annual interest cost savings," said Andy DeVries, analyst at CreditSights in a note. "In return, Calpine would have ruined years and years of goodwill built up with bondholders." Price-sensitive Calpine pulls high-yield bond deal

Financial intermediation theory predicts that relationship lending is a function distinctly practiced by banks for two key reasons. First, banks can economize on the costs of screening and monitoring as compared to public markets.[1] Second, because firms and banks expect to deal with each other repeatedly, concerns for reputation can potentially improve outcomes.[2] In contrast, lenders in public markets, such as bond investors, are typically treated as arms-length, dispersed investors.[3]

However, in recent years bond ownership has become dominated by a few large institutional investors. Moreover, these investors' participation decisions in firms' new bond issues are sticky (e.g., Zhu (2021)). These phenomena raise the question of whether similar forms of reputation-based relationship lending also exist between firms and large institutional investors. For example, Fidelity may be more willing to buy the bonds of a firm with which it anticipates to interact repeatedly. Conversely, knowing that it will want to borrow from Fidelity again in the future, the firm may avoid certain actions (e.g., financing and investment decisions) that impose losses on Fidelity to preserve the bondholder relationship.

Testing for this type of relationship lending is extremely difficult because it requires observing a firm's action that is costly in the short-run, but maximizes the firm value when incorporating the long-term benefits of building or preserving bondholder relationships. In this paper, we analyze a setting in which we can cleanly identify such a tradeoff: firms' call policies. Following an increase in its bond prices, fixed-price calls give the firm the option to force existing bondholders to sell their bonds back at a below market price, hence, imposing a loss on these bondholders. After a call, firms typically refinance the called bond with new debt. If the composition of a firm's bondholder base does not matter and all investors are fungible, then refinancing the bond should be close to costless.[4] However, could the fact that these existing bondholders were just forced to sell their bonds at a below market price damage the relationship and make them reluctant to participate in the firm's future offerings? Anecdotally, the answer to this question seems

[1] For example see Diamond (1984) and Boyd and Prescott (1986).

[2] See Gorton and Winton (2003) for a nice discussion. Petersen and Rajan (1995) show how concerns for future rents can also lead to relationship lending.

[3] e.g., see Rajan (1992) who states "However, a typical arm's-length creditor like the bondholder receives only public information. It is hard to contact these dispersed holders and any renegotiation suffers from information and free-rider problems."

[4] Besides fees to investment bankers which typically range between 70 - 120bps. See The New Floor for Bond Underwriting Fees: $1.

to be “Yes”. As the quote at the top of the paper states, Calpine, an electric utility company, canceled its plan to call a fraction of its existing bonds and refinance them at lower rates specifically to avoid angering its existing bondholders.

In this paper, we show that consistent with this anecdote, 1) firms value bondholders relationships and 2) calls directly impact these relationships. Existing bondholders are substantially less likely to participate in a firm’s subsequent bond issues following a fixed-price call. Moreover, the drop in participation is highest for funds from the largest fund families, suggesting that fixed-price calls cause firms to lose their most valuable bondholders. In turn, firms internalize the negative cost of calls by delaying calling their bonds when their bondholder base contains more of these valuable funds. Finally, we show that firms build reputation through their call policy which affects their future borrowing costs. Taken together, our results are consistent with relationship lending in public financial markets.

Our analysis uses holdings data of global institutional bondholders from eMAXX, which we merge with US corporate bond data from Mergent FISD. To test whether fixed-price calls affect bondholder relationships, we first first examine whether fixed-price calls affect the composition of firms’ bondholder bases. Identifying the effects of fixed-price calls on firms’ bondholder bases is challenging as bondholder bases could mechanically change whenever firms refinance bonds, regardless of whether they refinance via a fixed-price call or not. We address this challenge by comparing the change in bondholder composition between bonds that were called using a fixed-price call and a make-whole call. We explain in much more detail the features of these two types of calls in Section 3, but the key difference is that fixed-price calls impose a loss on bondholders, while make-whole calls do not.[5] Hence, this comparison allows us to directly test whether losses imposed by firms’ call decisions affect existing bondholders’ participation decisions in subsequent issuances.

Our main result is that existing bondholders are far less likely to purchase new bonds issued by the same firm following a fixed-price call versus a make-whole call. This reduced participation represents an economically relevant 15% drop from the unconditional average. Our identifying assumption is that absent the call, bondholders who experienced a fixed-price call would have participated in the issuer’s subsequent bond issuances similarly to bondholders who experienced a make-whole call. We provide evidence supporting this assumption by showing that the gap in participation rates only appears after the fixed-price call, with no difference in participation rates prior to the call (i.e., parallel trends). We find similar estimates when comparing participation dynamics across fixed-price and make-whole calls within bondholders, suggesting that shocks differentially affecting funds do not drive the drop in participation rates. Similarly, our results cannot be explained by

[5] As discussed below, if anything, make-whole calls result in a transfer from equityholders to bondholders.

differences in issuance rates across issuers, differences in holdings positions across funds, or changes over time in issuer characteristics. Finally, we find very similar results if we use maturing bonds as an alternative benchmark to fixed-price calls, suggesting that the drop in participation rates is coming specifically from bondholders reacting to fixed-price calls and not other factors related to make-whole calls.

We next show that the reduction in participation rates is substantially higher among funds belonging to the 5 largest fund families ("top 5 family funds").[6] We find that top 5 family funds take larger positions in bonds and are more likely to participate in future issuances of the same firm, suggesting that the departure of those funds deprives issuers of their most valuable bondholders. For instance, Giannetti and Jotikasthira (2022) show that large funds better internalize their price impact when they face fund outflows, potentially reducing non-fundamental volatility in firms' bonds. Large fund families may also be able to engage in cross-trading within their family to mitigate flow-induced fire sales (Eisele et al., 2020).[7] Sverchkov (2020) shows theoretically that allocating bonds to large investors can improve secondary market liquidity. Finally, firms seem to favor allocating to large investors in both bond markets (Alloway, Mackenzie, and Rodrigues, 2014) and equity markets (Jenkinson and Jones, 2009).[8]

Not only do participation rates of the firm's most valuable bondholders drop the most after a fixed-price call, but the drop persists for over 3 years after the fixed-price call. Furthermore, firms do not replace those bondholders with observably equivalent ones: the firm's aggregate bondholder base deteriorates after a call with funds from large families holding a smaller fraction of newly issued bonds, especially when the called bond had a high ownership of such funds.

Our main finding that some bondholders are less likely to participate in subsequent bond offerings following a fixed-price call relates to the idea of IPO underpricing and the incentive for issuers to "leave a good taste in investors' mouth" so that they will participate in future offerings (Ibbotson, 1975). Since fixed-price calls induce a transfer from the bondholders to the equityholders, we argue that our results are consistent with larger investors punishing the firm following calls. The threat of large fund families not participating in future bond offerings is credible because these bondholders are likely to be hard to replace and valuable to issuers. Consistent with this punishment hypothesis, we show that all of our main effects are driven by the firm's bondholders in the called bond, but not other bonds.

For the above mechanism to be relevant, it must be the case that firms do not always follow the textbook call policy (i.e., call the bond immediately once the bond price hits

[6]Inozemtsev (2023) shows that on average the top 5 largest institutional investors hold over 40% of the amount outstanding of a bond.

[7]See also SEC Reins in Internal Bond Trading.

[8]Jenkinson and Jones (2009) poll firms regarding IPOs and find that they prefer allocating shares to large funds and those they deem long-term investors.

the call price).[9] Consistent with earlier work analyzing firms' call policies (Vu, 1986, King and Mauer, 2000 and François and Pardo, 2015), we find that firms significantly deviate from the textbook policy.[10] We show, conservatively, that about 43% of fixed-price calls are delayed. Hence, we argue that firms can induce attractive bondholders to remain invested in the firms' bonds by delaying their calls.

If firms anticipate that calls negatively affect bondholder relationships, they should consider this cost when deciding whether to call a bond. Hence, we hypothesize that firms with a more attractive bondholder base, i.e., more large fund families, should be more likely to delay calling their bonds. To test this hypothesis, we estimate predictive regressions for call delays with various firm characteristics and fixed effects as independent variables. We find that firms with a higher share of top 5 family funds in their bondholder base are more likely to delay fixed-price calls, suggesting that firms internalize the negative effects of calls on their bondholder base.

How much money are firms leaving on the table by delaying their calls? Isolating this number could, by revealed preferences, provide a rough estimate of the value of bondholder relationships to the firm. To answer this question, we follow a similar methodology of King and Mauer (2000) by pricing delayed callable bonds using market prices of comparable bonds. Using this approach, we find that firms are leaving about $12.1mm dollars per year per bond on the table, which amounts to an average of about 1.1% of total equity value. Under the simplifying assumption that the only reason firms delay their calls is to maintain the bondholder base, our results imply that firms are willing to pay $12.1mm a year to have 3pp (20%) more top 5 family bondholders in their bondholder base, suggesting these firm/bondholder relationships are economically meaningful.[11] This number is also in the ballpark of the Calpine example ($12mm).

As mentioned above, concerns for reputation can potentially improve outcomes in relationships. Our last set of tests provide direct evidence of firms developing reputations based on their call policies. Specifically, we show that 1) past call delays are highly predictive of future call delays, and 2) delaying a call in the past three years reduces the yield on newly issued fixed-price callable bonds by just over 30bps, suggesting that investors anticipate firms' future call behavior.

Taken together, our results are consistent with relationship lending in bond markets. While our setting focuses on firms' call decisions, we believe the implications of our results are more general, as firms may also be internalizing the impact of their decisions on bondholders in other situations (e.g., investment and capital structure decisions). For example, Malenko and Tsoy (2020) show theoretically how firms may avoid increasing leverage at the expense of existing debtholders if it damages their reputation, thereby

[9] We explain the textbook call policy in much more detail in Section 3.

[10] Also see Chen, Cohen, and Liu (2022) who show that municipal bond issuers delay their calls.

[11] We discuss in Section 6.1 why this may be an overestimate but also could be an underestimate of the true value of these relationships.

raising the costs of borrowing in the future.

2 Related Literature

To our knowledge, our paper provides the first evidence of relationship lending in bond markets.[12] While the relationship lending literature has traditionally focused on banks, more recent papers argue that the line between bank and arms-length may be less stark than originally thought (e.g., Sverchkov, 2020 and Geelen, Morellec, and Rostova, 2021). Empirically, Zhu (2021) shows that mutual funds' bond investment decisions are sticky at the firm level. We show that firm/bondholder relationships can explain this stickiness and how, in turn, firms' financial policies affect these relationships.

This is also the first paper to analyze the effect of corporate call policy on the composition of a firm's bondholder bases. We argue that this is a natural question that, up until this point, has been entirely unexplored. Our results suggest that calling a bond is not as simple as replacing an old bond with a new one: it fundamentally changes the ownership structure of the firm's bonds. For this reason, our paper contributes to the growing literature analyzing the determinants and implications of bond ownership structure (Massa, Yasuda, and Zhang, 2013, Dass and Massa, 2014, Coppola, 2021, Kubitza, 2021, Giannetti and Jotikasthira, 2022, Siani, 2022, Koijen and Yogo, 2023 and Li and Yu, 2023).[13]

Our paper provides direct evidence on the role of firm reputation in financial markets. Diamond (1989), Diamond (1991) and Malenko and Tsoy (2020) show that firms can build a reputation in the bond market through their history of debt repayments and issuances. However, as far as we are aware, most of the empirical literature on reputation focuses on underwriters/investment banks (e.g., Beatty and Ritter, 1986, Carter, Dark, and Singh, 1998, Fang, 2005, Lewellen, 2006, Golubov, Petmezas, and Travlos, 2012 and Griffin, Lowery, and Saretto, 2014).[14] By showing that call delays are predictable and affect future bond pricing, we provide direct empirical evidence of firms endogenously affecting their reputation through their financial decisions. Moreover, firms appear to internalize the cost of their calls on their bondholders. Although our evidence is focused on corporate call policy, we believe similar considerations are likely important for other financial or investment decisions.

[12]For the reasons mentioned above, directly testing for relationship lending is extremely difficult. Hence, although our paper is focused on relationship lending in bond markets, our results, which cleanly identify the importance of relationships in financial markets, contribute to the broader relationship lending literature.

[13]Because we analyze investor participation decisions in new issues, pour paper also contributes to the growing literature on primary market allocations in bond markets (e.g., Nikolova, Wang, and Wu, 2020, Ottonello, Rizzo, and Zambrana, 2022 and Siani, 2022).

[14]A few papers empirically analyze investor reputation (Gorton, 1996, Ross, 2010 and Johnson and Swem, 2021).

Because we focus on firms' call policies, our paper relates to the literature analyzing callable debt. One strand of this literature explains firms' fixed-price call policies once callable debt is already in place. The "textbook" call policy, first developed in Brennan and Schwartz (1977) and Ingersoll (1977), in which firms should call their bonds the moment the bond price hits the call price. However, as documented in Vu (1986), King and Mauer (2000), François and Pardo (2015) and our own paper, firms delay their calls beyond the textbook call date often. Existing theoretical rationales for these deviations include i) transaction costs (Mauer, 1993), ii) multiple issues of debt affecting the wealth transfer (Longstaff and Tuckman, 1994) and iii) managing covenants (Vu, 1986, Green, 2018).[15] Empirically, Vu (1986), King and Mauer (2000) and François and Pardo (2015) analyze the determinants of call policies and show that delays are frequent and can partially be explained by several of the explanations above.[16] We offer a new, non-mutually exclusive, explanation for why firms deviate from textbook call policy: by avoiding imposing a loss on bondholders, firms can maintain and attract investors with favorable characteristics to hold their bonds.

The second strand of literature on callable bonds, which we explain in more detail in Section 3, analyzes why firms issue these securities to begin with (Bodie and Taggart, 1978, Boyce and Kalotay, 1979, Barnea, Haugen, and Senbet, 1980, Brick and Wallingford, 1985, Robbins and Schatzberg, 1986, Elsaify and Roussanov, 2016 and Becker et al., 2021). While our main goal is not to explain why firms use callable debt ex-ante, our findings do suggest that firms may be able to use callable debt as a method to build relationships with valuable bondholders by building a reputation for delaying their calls.

3 Institutional Details

In this section, we explain the mechanics of fixed-price and make-whole calls.

The traditional form of callable debt is the fixed-price call. In the full Mergent FISD sample after our filters, all callable bonds were fixed-price until 1988 and the vast majority until 1996. Fixed-price calls give the firm the option to buy the bond back at a predetermined call price after some period of time, or call protection period. The call protection period usually lasts several years, depending on the maturity of the bond. The call price is either fixed or varies over time via a call schedule. Typically, the call price will decrease over the call schedule periodically over the life of the bond.

The "textbook" call policy for fixed-price calls was first developed in Brennan and Schwartz (1977) and Ingersoll (1977). In a frictionless capital market, firms should call

[15] Callable debt can also create prepayment risk when investors cannot determine the issuer's firm value-maximizing call policy (François and Pardo, 2015).

[16] Green (2018) uses a revealed preference approach around firms' call policies to estimate the value of covenants.

their bonds the moment the bond price hits the call price.[17] The following explanation in King and Mauer (2000) captures the intuition of this result very well.

> "In a perfect capital market, the optimal call policy is to call a bond the first time its market value reaches the call price. All else being the same, the firm should avoid calling when the market value of the bond is below the call price. This would needlessly give the bondholders a capital gain equal to the difference between the call price and the market value of the bond. Alternatively, bondholders should not be willing to trade the bond at prices above the call price, since the firm could call the bond, giving the bondholders a capital loss equal to the difference between the market value of the bond and the call price. Thus, since the firm should not call when the market price is below the call price, and rational investors should not be willing to trade the bond above the call price, the optimal policy is to call the bond when its market value first equals the call price."

In a frictionless world where total firm value does not depend on the call policy, if the bond hits the call price, the firm should call the bond to induce a wealth transfer from bondholders to equityholders, thereby maximizing equity value. However, as discussed in the introduction, firms often deviate from this textbook policy and delay calling their bonds, a result we confirm in our later analysis.[18]

The other main type of call, which has increased in popularity in recent years, is the make-whole call. Make-whole calls give the firm the option to repurchase the bond at a value that is computed by taking the remaining interest and principal payments of the bond and discounting them at a very low interest rate. Typically, this interest rate is calculated as the benchmark treasury rate plus a small spread (typically between 0 and 50bps). Hence, as Elsaify and Roussanov (2016) mention, the spread is set such that the bond is never "in the money", i.e., the firm will never borrow at terms this favorable and hence, in a frictionless market, a make-whole call would almost never be exercised.[19] In contrast to fixed-price calls, there is typically no call protection period for make-whole calls, so firms can exercise these calls at any time over the life of the bond.

Make-whole and fixed-price calls are not mutually exclusive. In our sample (described below), about 43% of callable bonds contain both fixed-price and make-whole calls. In most of these cases, the bond is freely callable via make-whole during the call protection period and thereafter, callable via fixed-price.

Why do firms use callable debt? The traditional rationales for callable debt include i) tax benefits (Boyce and Kalotay, 1979, Brick and Wallingford, 1985 and Hennessy and Tserlukevich (2008)), ii) mitigating information asymmetries (Barnea, Haugen, and

[17]See Tewari, Byrd, and Ramanlal (2015) for an excellent analysis of the determinants of call prices.

[18]Chen, Cohen, and Liu (2022) offer an additional explanation for delays of municipal bond calls based on the limited attention of municipalities' finance departments.

[19]According to FRED, in our sample period of 2000 - 2020, the lowest spread between the Aaa index and the 10-year treasury rate was 65bps, which is outside the upper end of the typical make-whole spread.

Senbet, 1980 and Robbins and Schatzberg, 1986) and iii) mitigating agency problems such as debt-overhang (Bodie and Taggart, 1978, Barnea, Haugen, and Senbet, 1980, and Becker et al., 2021). Elsaify and Roussanov (2016) argue, given the rise of make-whole bonds, that the real rationale for callable debt is the ability for firms to match their liabilities to their assets.[20]

4 Data and Sample

4.1 Data

We obtain bond ownership data from Refinitiv (formerly Lipper) eMAXX. The dataset includes quarterly holdings data for all global holders in eMAXX for the universe of US corporate bonds for the period 2000 to 2020. For our sample of bonds, the large majority of holdings (over 91.7% by value) are attributed to US holders. The two largest groups of holders are mutual funds and insurance-affiliated funds that respectively hold 38.1% and 54.2% of US corporate bonds in our sample by value. In an average quarter, there are 7,300 different fund-level holders that are managed by or affiliated with 1,500 different fund families.

We complement the bond ownership data with bond-level characteristics from Mergent FISD. We apply several filters that are standard in the corporate bond literature. Specifically, we remove bonds from financial firms, government agencies, and firms domiciled outside the US. We also remove convertible bonds, preferred stock, exchangeable bonds, and bonds denominated in foreign currencies. Furthermore, we match this sample of bonds to firm-level issuers in Compustat to obtain quarterly firm-level data. In some of our tests, we require secondary market bond prices and yields which we collect from TRACE. For those tests, our sample begins in July 2002 (the date at which TRACE coverage begins).

4.2 Sample and Descriptive Statistics

One of the main goals of our analysis is to examine the impact of firms' call policies on their bondholder base. We start by documenting call characteristics in our sample of US corporate bonds (Table 1). On average, we find that 83% of corporate bonds are callable. Out of all callable bonds, 64% have a fixed-price call provision, 78% have a make-whole call provision, and 43% have both. Importantly for our study, we find that 27% of callable bonds are called, indicating that calling a bond is not a rare event for

[20]Consistent with this idea, Xu (2018) shows that firms frequently adjust their maturity structures. Similarly, Ma, Streitz, and Tourre (2023) posit that high-yield firms call their debt early to minimize rollover risk. Powers and Tsyplakov (2008) also argue that make-whole calls provide financial flexibility for firms to pay down debt early.

firms. The large majority of call events are attributed to fixed-price calls (63%) relative to make-whole calls (37%), which may be explained by the fact that fixed-price calls are typically more attractive for issuers than make-whole calls since fixed-price calls result in wealth transfer from bondholders to equityholders. Finally, we observe that out of the 1,276 fixed-price callable bonds for which the bond ends up hitting the call price, 43% of calls are delayed, implying a substantial deviation from optimal call policy.

In our main analysis, we exclude observations in which a firm repays multiple bonds in a year (for instance, one fixed-price and one make-whole call or bond that is called and another that matures) to make sure we have one single "event bond" (i.e., a bond that is being repaid) per event. We identify 1,390 call events, 1,001 (i.e., 72%) of which are classified as fixed-price calls, and the remaining 389 are classified as make-whole calls. We refer to this sample of 1,390 bonds as "event bonds," and we present additional summary statistics for those in Panel A of Table 2. Section A contains detailed variable definitions. Our sample of event bonds includes both investment grade (82%) as well as junk grade (18%) bonds. The average bond has a maturity of 10 years and $330mm of par amount outstanding one year prior to the call.

Panel B displays issuer (or firm) characteristics of our sample of event bonds. We identify 905 unique issuers in our sample of event bonds. To limit the influence of calls on the descriptive statistics, all of the variables hereafter are measured one year before the event year. The average issuer has sales of $1.46bns and book leverage of 58% with tangible assets accounting for 37% of total assets.

Next, we present summary statistics of the universe of funds that hold event bonds.[21] Panel C of Table 2 shows that for the sample of existing bondholders, the average unconditional participation rate in new issuances of bonds by the same issuer (i.e., the share of newly issued bonds in which the fund participates) is 11%. Later in the analysis, we will analyze differences in participation rates across different types of funds, namely funds that belong to a top 5 family and funds that do not. We find that top 5 family funds make up a large portion (11%) of bond holdings in a given year (see Section 5.3 for more details).

Finally, Panel D of Table 2 presents summary statistics for all bonds issued by the issuers of our sample bonds one year prior to the respective call events. Our sample contains 507 such new bond issuances. We summarize several dimensions of their bondholder bases that will serve as a point of comparison in our analysis of how fixed-price calls affect bondholder compositions.

[21] We discuss how we define the set of bondholders in further detail in Section 5.1.

5 The Effect of Calls on Firms' Bondholder Bases

In this section, we show that fixed-price calls negatively affect firms' relationship with existing bondholders, thereby altering their bondholder bases. We first explain our empirical approach in Section 5.1 before presenting our results in sections 5.2-7.

5.1 Empirical approach

In this section, we explain our main empirical approach to identifying the effect of fixed-price calls on firms' bondholder bases. We employ our sample of event bonds that are retired via a call and examine the participation of holders of those bonds in other bonds issued by the same issuer before and after the call. To enter the sample of bondholders, a fund in eMAXX needs to hold the called bond four years prior to the call event, and we examine the participation of those bondholders in all bonds issued by the firm from three years before until three years after the call event ("event window").

Our main specification compares bondholders' participation rates following fixed-price calls ("treated" group) and make-whole calls ("control" group). Make-whole calls are a natural benchmark for fixed-price calls for two reasons. First, make-whole calls are similar to fixed-price calls in that they are at the option of the issuer and create refinancing needs. Second, make-whole calls do not impose a wealth transfer on existing bondholders because they compensate bondholders for the value of lost interest payments, hence the name "make-whole". Comparing fixed-price calls to make-whole calls, therefore, allows us to pin down the effects of firms' voluntarily inducing refinancing in a way that hurts bondholders versus inducing refinancing that does not hurt bondholders.

For each firm in our sample, we collect information on all bonds issued over our symmetric three-year event window and estimate the following event-study specification at annual frequency:

$$Participation_{f,i,t} = \alpha_{f,i} + \mu_t + \sum_{k=-3}^{+3} \beta_k \cdot \textit{Fixed-price Call}_{i,t0} \cdot 1_{t0+k} + \epsilon_{f,i,t}. \quad (1)$$

The dependent variable, $Participation_{f,i,t}$, is the fraction of bonds issued by issuer i in year t in which bondholder f participates. This formulation allows for neutralizing mechanical differences in participation rates due to variations in the number of bonds issued by the firm in a given year.[22] We measure the participation rate in the quarter during which the bond is issued. The main right-hand side variable, $\textit{Fixed-price Call}_{i,t0}$, is an indicator equal to one if issuer i retires a bond at the event time t_0 via a fixed-price call and zero if it retires the bond via a make-whole call, which we interact with time-to-

[22]However, as shown in Table A1 our results are robust to using a dummy variable that equals one if the fund participates in *any* bond that is issued by the firm in that year.

event dummies 1_{t0+k}. We set the year before the event (i.e., $k = -1$) as the baseline. We also include bondholder × event fixed effect ($\alpha_{f,i}$) and year fixed effects (μ_t). Finally, we cluster our standard errors by fund f.

Our main object of interest is the set of estimates for the β_k coefficients. If fixed-price calls damage bondholder relationships, we should observe lower participation rates of existing bondholders following a fixed-price call, i.e., $\beta_k < 0$ when $k \geq 0$. Intuitively, for a call to damage a bondholder relationship firms must actually observe that the call has occurred. Hence, we would expect that the bondholder relationship should only be damaged after a fixed-price call.[23]

Our identifying assumption is that absent the call, funds that experienced a fixed-price call ("treated funds") would have participated in the issuer's subsequent bond issuances similarly to funds that experienced a make-whole call ("control funds"). One necessary (but not sufficient) condition for our identifying assumption to hold is that treated funds were indeed behaving similarly to control funds prior to the call, i.e., $\beta_k = 0$ when $k < 0$ (absence of pre-trends).

5.2 Main results

Figure 1 presents the results of the estimation of Equation (1). We find no difference in participation rates between treated and control funds prior to the call, which supports our identification assumption. Consistent with fixed-price calls damaging relationships with bondholders, the relative participation rates of fixed-price calls drop after the call occurs. The effects appear one year after the call and continue to increase over time, suggesting that fixed-price calls damage long-term bondholder relationships.

Given that in our setting, treatment is staggered over time, we follow the recommendations of Baker, Larcker, and Wang (2022) and re-estimate Equation (1) using a "'stacked regression" specification (Gormley and Matsa, 2011). We find similar results (Figure A1), consistent with the large fraction of never-treated units (i.e., make-whole calls) limiting the scope for bias due to staggered treatment.

We also present the results of the estimation of the "reduced-form" version of Equation (1) in Table 3. In this specification, all the time-to-event dummies after the call (i.e., with $k \geq 0$) are collapsed into one $Post_t$ dummy. Specifically, we estimate

$$Participation_{f,i,t} = \alpha_{f,i} + \mu_t + \beta \cdot \textit{Fixed-price Call}_{i,t0} \cdot Post_t + \epsilon_{f,i,t}. \quad (2)$$

The main coefficient of interest is β which represents the difference in fund-level partici-

[23]Of course, fixed-price calls may be predictable to some extent; however, we show in Section 6.1 that they are far from perfectly predictable. Indeed, Ivashchenko and Rockinger (2023) find that bond prices jump when bonds that should have been called are not called. Make-whole calls are even more difficult to predict given they are almost never in the money.

pation rates across fixed-price and make-whole calls after the call occurs. In column 1 we report an estimated coefficient of 0.017, which is statistically significant at the 1% level. This estimate implies that participation rates of treated funds drop by 1.7pp after the call relative to control funds. Compared to the unconditional participation rate of existing bondholders of 11% (see Table 2), this implies an almost 15.4% drop in participation rates following fixed-price calls.

Alternative interpretations and robustness checks. Our explanation for why bondholders participate less after a fixed-price call is that by inducing a wealth transfer, firms damage their relationship with the bondholders. It is important to emphasize that any alternative explanation must not only explain why there is a difference in participation rate *after* a call, but why there is no difference in participation rates *before* a call. We next consider several alternative interpretations that could generate such patterns and attempt to rule them out empirically.

In column 2, the coefficient barely changes and remains statistically significant when we also control for firm characteristics, which include size (log of sales), profitability (EBITDA/Total assets), leverage (Debt/Capital), asset tangibility (Tangible assets/Total assets), and market-to-book ratio. This suggests that changes in firm characteristics are unlikely to be driving the results.

Another related concern is that firms calling bonds via fixed-price could experience different changes in credit quality around the call as compared to firms engaging in make-whole calls. For instance, if fixed-price issuers are more likely to move from junk rated to investment grade at the time of the call, the drop in participation rates could be due to clientele effects, i.e., bondholders ceasing to participate because the issuer has moved out of their preferred segment of the bond market. We address these concerns in columns 3 and 4. In column 3, we replace year fixed effects with rating $\times$ year fixed effects, where ratings are measured one quarter before the event. In column 4, we restrict the sample to call events where the rating of the issuer has been constant in the period leading to the call (including the year of the call). In both of these specifications the coefficient only changes marginally and remains statistically significant at the 1% level.

We address several other concerns in Appendix Table A1 which are described in further detail in the Appendix. However, to briefly summarize, we also show that our results cannot be explained by differences in the size of investor positions, differential investment dynamics of investors that hold bonds that were called via fixed-price or make-whole calls or differences in the type of bond issued ex-ante. Our results are also robust to an alternative binary measure of participation the investor's participation decision.[24]

[24]Our results are also robust to alternative standard error clustering choices (Appendix Table A3)

Alternative control group. These results imply that existing bondholders are much less likely to participate in subsequent issues after a fixed-price call. Given that our analysis compares the differential trends across fixed-price calls versus make-whole calls, we cannot identify whether these effects come from the fixed-price call or the make-whole call. In other words, it could be that firms are *more* likely to participate after a make-whole call. To address this issue, in Appendix Figure A2 and Table A2, we reestimate our main analysis using matured bonds as a control group and find very similar results. These results suggest that fixed-price calls are driving the reduction in participation rates.

Issuance rates. If calls damage bondholder relationships, one might wonder whether firms try to strategically time their issuances prior to calls to avoid issuing after they have damaged their relationships. Appendix Figures A3 and A4 show that the frequency of issuances over our event window for fixed-price calls and make-whole calls are quite similar. Moreover, in Appendix Figure A5 we estimate a regression comparing the issuance rates over the event window and find no statistically different issuance rates across fixed-price versus make-whole calls.[25] One explanation for the lack of difference in issuance timing could be that firms do not have much flexibility in the timing of the issuance. For instance, by issuing the bond earlier the firm must pay extra coupons on the bond prior to the call. Moreover, issuing early could risk violating leverage-based covenants. Finally, as shown below firms' appear to develop long-lasting reputations for their call policies. Hence, it is not obvious strategically timing issues benefit firms in the long-run.

5.3 Which funds stop participating?

Why would fixed-price calls damage bondholder relationships? While bondholders are hurt by fixed-price calls *ex-post*, they are compensated *ex-ante* through higher yields at issuance[26]. Therefore, it is not obvious why funds should stop participating in the firm's subsequent bond offerings after the fixed-price call.

We argue that not participating in subsequent bond issues is a way for valuable bondholders to punish the firm for calling the bond. By committing to not participate in future offerings, bondholders incentivize firms to delay their calls. However, for this commitment to be credible, the "punishment" must be costly for firms. This would be the case if those bondholders are 1) valuable to firms and 2) difficult to replace. In this section, we provide a first test of this channel by examining which funds are most likely to stop participating in new issues after fixed-price calls, and whether those funds are likely to be particularly valuable to firms.

[25]Relatedly, in Appendix Table A4 we find no statistically or economically significant change in firms' issuance rates, type of bond issued (callable versus non-callable), or amount issued after the call, across fixed-price and make-whole calls.

[26]E.g., see King and Mauer (2000).

A natural candidate for valuable bondholders are large fund families. Large fund families tend to 1) be able to internalize fire-sale externalities (e.g., Giannetti and Jotikasthira, 2022), 2) can engage in cross-trading across funds to minimize fire-sale spillovers (e.g., Eisele et al., 2020) and 3) can improve secondary market liquidity (e.g., Sverchkov, 2020). Moreover, firms seems to prefer allocating to them in both equity (Jenkinson and Jones, 2009) and bond markets (Alloway, Mackenzie, and Rodrigues, 2014).

Inozemtsev (2023) shows that on average the top 5 largest institutional investors hold over 40% of a bond. Hence, we create a proxy for valuable bondholders as funds belonging to the five largest fund families in terms of bond holdings in a given year ("top 5 family funds"). At the issuer-level, Appendix Table A5 shows that top 5 fund families tend to participate in a greater fraction of an issuer's bond issuances, even when controlling for individual fund characteristics. For these reasons and those mentioned above that already established in the literature, we argue that top 5 fund families are a natural candidate for valuable investors. Hence, a natural test of the punishment hypothesis described above is to study the drop in participation rates for top 5 family funds.[27]

We test this hypothesis by estimating a triple interaction version of Equation (1):

$$Participation_{f,i,t} = \alpha_{f,i} + \mu_t + \epsilon_{f,i,t} + \tag{3}$$

$$\sum_k \left(\beta \textit{Fixed-price Call}_{it0} + \nu X_f + \rho \textit{Fixed-price Call}_{it0} \cdot X_f\right) \cdot Post_t, \tag{4}$$

where X_f a dummy variable that equals one if the fund belongs to a top 5 family. Column 1 of Table 4 shows that while non-top 5 family funds participate 1.4pp less after a fixed-price call, top 5 family funds, in contrast, reduce participation rates by 4.6pp, i.e., they react 228% more than non-top 5 family funds. We find similar results when replacing year fixed effects with rating-year fixed effects (column 2). In column 3, we add issuer-year fixed effects, so as to compare bondholders of the same firm reacting to the same call event in the same year. We find very similar estimates: top 5 family funds react 3.4pp more than non-top 5 family funds. In column 4, we test whether this difference in sensitivity to fixed-price calls can be explained by individual fund characteristics. Fund controls include dummies indicating whether the firm is an insurance fund, a mutual fund, or one of the issuer's top 3 bondholders (as proxy for the intensity of the relationship with the firm), as well as the fund's total bond holdings (in logarithm). Fund controls are all interacted with *Post*, *Fixed-Price Call*, and *Post* × *Fixed-Price Call.* The coefficient of interest only marginally changes, suggesting that top 5 family funds indeed react substantially more than other funds. Overall, our findings support the hypothesis that valuable bondholders react more to fixed-price calls.

[27] Our results are not sensitive to specifically using the top 5 as the cutoff: we find similar results using the top 10 or 15 fund families.

5.4 Impact on the issuer's bondholder base

Our findings indicate that fixed-price calls lead bondholders to reduce their participation in subsequent bond issuances, particularly when they belong to large families. However, it is unclear how this ultimately affects firms' bondholder bases at the aggregate level. In particular, firms may be able to simply replace those bondholders with other funds from large families that were not previously owning the firm's bonds.

To address this question, we study the evolution of the bondholder base of newly issued bonds after fixed-price relative to make-whole calls. Consolidating all newly issued bonds issued by the firm in a given year, we estimate the following regression:

$$Y_{i,t} = \alpha_i + \mu_t + \nu_k + \beta \cdot \textit{Fixed-price Call}_{i,t0} \cdot \textit{Post}_t + \epsilon_{i,t}, \tag{5}$$

where $Y_{i,t}$ is the percentage of newly issued bonds held by top 5 families issued by firm i at time t, α_i represents firm-event fixed effects, μ_t year fixed effects, and ν_k year-to-event fixed effects. Standard errors are clustered at the firm level. Table 5 presents the results of the regressions.

If firms are not able to replace top bondholders who leave after a fixed-price call, the share of their bonds held by top 5 families should decrease following a fixed-price call as compared to a make-whole call. Consistent with this hypothesis, we find that the share of top five families decreases by 2.9pp (columns 1-2), a 19% drop from the unconditional mean.

In columns 3 and 4, we interact the $\textit{Fixed-price Call}_{i,t0} \cdot \textit{Post}_t$ term with a dummy variable that equals one if the share of Top 5 fund families in the bondholder base of the called bond is larger than the sample median. The interaction coefficient is negative and statistically significant, suggesting that the drop in aggregate large-family ownership is higher for firms with higher large-family ownership to begin with. Moreover, the coefficient for $\textit{Fixed-price Call}_{i,t0} \cdot \textit{Post}_t$ on its own is not statistically significant in either specification and close to zero in column 4 (with rating-year fixed effects). Hence, calls appear to be more costly for firms with higher initial levels of large-family ownership. This result will be important when we later analyze how firms' call decisions relate to its ex-ante bondholder composition.

5.5 Punishment mechanism

While our results are consistent with existing bondholders punishing firms for fixed-price calls, an alternative mechanism is that investors are simply learning something about the firm which causes a change in its investor base. To hone in on the punishment mechanism we augment the main sample of bondholders with those who hold bonds of the same firm that are not called (i.e, other bondholders). We then test whether these other bondholders react differently to those that were specifically affected by the call. Intuitively, if investors are simply learning about the firm from the call, the change in participation decisions should be similar for the firm's bondholders who are not directly affected by the call.[28]

Specifically, we estimate (3), but include an additional interaction term *Other*, which is a dummy variable that equals one if the bondholder does not hold the bond that was specifically called. Table 6 displays the results. Column 1 shows that fixed-price calls cause a 0.6pp drop in participation rates among the entire sample of funds. Notice, that this effect is much smaller than the baseline effect we find in Table 3. Column 2 includes the interaction term *Other* and shows that the effect is much larger for bondholders who specifically hold the called bond. We find similar results in columns 3 and 4 with rating-year fixed effects and issuer-year fixed effects respectively.

In Appendix Tables A6 and A7 we split these results by top 5 families and non-top 5 families and show that the difference in participation rates between the called bond and other bondholders is about four times as large for top 5 families. This result is consistent with the punishment mechanism being particularly relevant for the funds that are the most valuable to the firm.

Taken together, these results further bolster the idea that bondholders are punishing firms for fixed-price calls because they impose losses on them.

6 Bondholder relationships and firms' call policies

If calls damage bondholder relationships, firms should internalize this cost ex-ante when they decide whether to call a bond. In particular, if firms have more valuable bondholders in their bondholder base they may be less willing to call their bonds. Under this hypothesis, we would expect that bond ownership characteristics are important for explaining observed call decisions. In this section, we explore and test this hypothesis.

6.1 Call delays

We start by examining if the composition of the bondholder base impacts corporate call policies. Specifically, we classify firms' call decisions based on whether they follow the textbook call policy for each bond containing a fixed-price call provision in our sample. We refer to instances that deviate from this textbook call policy as call delays. Because bonds can be called at multiple points, we consider each date in the call schedule as a separate potential call event.

To identify whether a call was delayed, on each trading day in the call schedule we

[28]These investors would be able to observe the call since these calls are typically publicly announced by the firm.

examine whether the bond price reaches the most recent call price and is subsequently called. If the bond price equals or exceeds the call price and the firm does not call the bond within 90 days, we refer to this bond as delayed. On the other hand, if the bond reaches the call price and is called within 90 days, it is not considered delayed. Note that delays also include bonds that were never called and should have been called according to the textbook policy. Moreover, we exclude bonds that never reach the call price and hence should never be called under the textbook call policy. Because this analysis requires TRACE secondary market bond trading data, this part of the analysis only includes bonds that were first callable after July 2002 (when the TRACE dataset begins).

The approach we take for classifying call delays is fairly conservative because we allow the firm 90 days to call the bond after the bond reaches the call price. With this conservative approach, we find that 43% of bonds are delayed. The average time the call is delayed is 557 days.

Because of various frictions described in Section 3 and past empirical evidence (e.g., King and Mauer, 2000)[29], we do not expect firms to perfectly follow the textbook call policy for other reasons. However, we are not attempting to fully explain firms' deviation from the textbook policy, but rather show that bondholder composition is an additional factor that can explain these deviations.

To test whether the composition of firms' bondholder bases affects their call decisions, we estimate the following regression:

$$Delay_i = \Gamma X_i + \mu_t + \epsilon_i, \tag{6}$$

where $Delay_i$ is a dummy that equals one if the bond was delayed and equals zero it was called on time, X_i is a vector of firm/bond-level controls which include profitability, tangibility, sales (in logs), book leverage, the offering amount of the bond (in logs) and whether or not the debt contains a negative pledge covenant. We include time fixed effects (μ_t) and cluster standard errors by 2-digit industry. The results are displayed in Table 7.

In column 1, we only include firm-level controls and find that more profitable firms and larger firms are more likely to delay their calls. In column 2, we test whether firms with more valuable bondholders are more likely to delay their calls. Specifically, we include the share of bonds held by funds that belong to top 5 families as an additional independent variable. The estimated coefficient is positive and statistically significant. The estimated coefficient of 0.215 implies that a one standard deviation increase in top 5 family holdings (0.14) results in a 2.9pp (about 6.7%) increase in the likelihood of delaying the bond. In

[29]See also Ma, Streitz, and Tourre (2023) and Ivashchenko and Rockinger (2023) for recent empirical evidence of this.

column 3, we show that this result is robust to including bond-level controls (offering amount and whether the bond has a negative pledge covenant) as well as rating fixed effects. These results suggest that firms internalize the fact that they will lose valuable bondholders after a call and become more reluctant to call when they have more valuable bondholders in their bondholder base. In other words, the composition of the bondholder base, and in particular the presence of valuable bondholders, affects call decisions.

In Section 5.3, we discuss several different channels for why losing bondholders from large fund families may be costly. While testing the exact reason why large fund families are valuable to firms is challenging and beyond the scope of our paper, the tests above provide direct evidence, by revealed preference, that these funds are indeed valuable to the firm.

Building on these results, we can provide a back-of-the-envelope calculation of how valuable such bondholders are to issuers. To do this, we take a similar approach to King and Mauer (2000) by finding comparable bonds to delayed calls and measuring the opportunity cost of leaving those bonds uncalled. Specifically, for each delayed bond, we find non-callable bonds that have the same rating, are within the same two-digit SIC code, and mature within 12 months of the delayed bond.[30] We define the annual opportunity cost for each bond at the beginning of the call period as follows:

$$\textit{opportunity cost} = \textit{coupon}/\textit{call price} - \textit{yield on matching bond}, \tag{7}$$

where *yield on matching bond* is the average yield-to-maturity on matched bonds and *coupon/call price* represents the effective yield the firm is paying by delaying its call since it can repurchase the bond at the call price. Naturally, the higher the coupon and the lower the call price, the larger the opportunity cost is for the firm.

Following this approach, we are able to successfully match 154 delayed bonds. The average annual opportunity cost is 3.8%, which amounts to a cost of $12.1mm per year per delayed bond, or about 1.1% of firm equity value. If we assume that the only reason firms delay their calls is to affect the bondholder base, our results imply that firms are willing to pay $12.1mm a year to have 3pp more large bondholders in their bondholder base. This back-of-envelope calculation may be an overestimate if, as we discuss in Section 3, firms delay calling their bonds for other reasons besides maintaining their bondholder base. On the other hand, the effect could also be larger since there is no reason to think firms are perfectly indifferent between delaying and immediately calling their bonds.

One concern with our results regarding call delays is that the secondary market price of the bond should be affected by the market's anticipation of the firm's call behavior. For example, if the market expects the firm to call the bond, the price should exactly

[30] We find very similar results if we require the matched bonds to be from the same issuer, but do not make any restrictions on the maturity of the bond. Limiting the matched bonds based on maturity makes the sample too small.

equal the call price. However, if the market expects the firm to delay, this would simply cause the bond price to increase beyond the call price. Fortunately, our definition of call delay does not depend on how much the bond price exceeds the call price; hence, these results are not affected by this mechanism.

7 Reputation in bondholder relationships

The reputation of borrowers and lenders plays a key role in relationship finance. For example, Gorton and Winton (2003) state:

> "...long-term relationships between banks and borrowers allow for improved outcomes through implicit contracts enforced by concerns for reputation or future rents"

Specifically, concerns for reputation can mitigate incentives by firms to take actions that benefit equity holders at the expense of creditors (e.g., Jensen and Meckling (1976)). We next directly test for the role of issuer reputation in bond markets.

A simple way to test for firm reputation in our specific setting is to examine whether there is persistence in firms' call decisions. Specifically, we regress *Delay* on two different measures of past delays: *Previous Delay (3yr)* and *Last Call Delayed*. *Previous Delay (3yr)* is a dummy variable that equals one if the firm has delayed a bond in the past 3 years, and *Last Call Delayed* is a dummy that equals one if the last bond of the issuer has been called with a delay. For the previous delay variables to be meaningful, we require the firm to have had an opportunity to call a bond that hit the call price in the past three years. We again include time fixed-effects and again cluster our standard errors by 2-digit industry. The results are displayed in Table 8.

In column 1, we include *Previous Delay (3yr)* as the independent variable. The coefficient is positive and statistically significant. Specifically, if a firm delays a call in the past three years, the likelihood that they delay the next call increases by 27pp, which is almost double the unconditional probability of delay. We find similar results in column 2 when we control for bond characteristics. We also find similar results in columns 3 and 4, which include *Last Call Delayed* as the main independent variable. Taken together, these results suggest that firms can develop a reputation for delaying their calls, given that their call decisions can be predicted by past call decisions.

If firms build a reputation for delaying calls, this should be reflected in the initial yields they receive on bonds. We test this by estimating the following regression:

$$\textit{Offering Yield}_{i,t} = \beta \textit{Previous Delay (3yr)}_{i,t} + \Gamma X_i + \mu_t + \epsilon_{i,t}, \quad (8)$$

where *Offering Yield*$_{i,t}$ is the initial yield on bond i issued in quarter t in percentage points, X_i are bond-level controls at issuance which include maturity (in logs), whether the bond has a negative pledge covenant, bond size (in logs), *Fixed-price Call* and rating fixed effects (measured as the average across Moody's and S&P). We also include time fixed effects and cluster our standard errors by 2-digit industry. To keep the pricing comparison as tight as possible, we exclude non-callable bonds from the sample, although our results are very similar if we do not apply this filter.

The results are displayed in Table 9. In column 1 we first show that bonds with fixed-price calls have on average 37bps higher offering yields. In column 2, we show that this effect is attenuated if the firm has delayed a call in the previous 3 years. Finally, in column 3, we include quarter by find very similar results when we use rating × time fixed effects. Taken together, these results suggest that firms build a reputation for delaying their bonds, which then affects future bond yields.

8 Conclusion

In this paper, we use corporate call policy as a laboratory to test for the existence and extent of relationship lending in bond markets. While previous literature has treated bond investors as arms-length, our evidence suggests that firms develop relationships with bondholders and avoid taking actions that can damage those relationships.

To summarize, following a call, existing bondholders are far less likely to participate in a new bond issue. We also find that the largest drops in participation rates exist among large fund families who are likely to be most valuable to the firm. In turn, firms are more likely to delay calling their bonds when they have more funds from large fund families in their bondholder base. Finally, we show how firms can develop a reputation for delaying calls which in turn affects their ex-ante cost of borrowing.

We focus our analysis specifically on corporate call policies because we can more easily identify the costs of these particular actions on bondholders. However, we argue that the implications of our results are much broader. For example, many models assume firms make investment decisions and leverage choices that minimize the value of debt in order to maximize the value of equity (e.g., Jensen and Meckling, 1976), which can have negative long-term consequences when the firm lacks commitment (Admati et al., 2018; DeMarzo and He, 2021). However, reputation can mitigate the negative consequences of these decisions (e.g., Diamond, 1989, Diamond, 1991 and Malenko and Tsoy, 2020). Hence, we believe the mechanism we uncover empirically in this paper should also be important for other decisions firms make that affect the value of their debt, such as investment and leverage decisions.

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Appendix A. Variable Definitions

A. Bonds

Delay: Dummy that equals one if the bond is not called within 90 days after the bond price hits the call price, 0 if it is called within 90 days of the bond price hiting the call price. Source: TRACE and FISD.

Fixed-Price Call: Dummy that equals one if the bond is called via fixed price, 0 if it is called via makewhole. Source: FISD.

Investment grade: Dummy variable that equals one if the bond has a Standard & Poors investment grade rating. Source: FISD.

log(Maturity): Natural logarithm of the maturity of the bond in months. Source: FISD.

log(Offering Amount): Natural logarithm of the offering amount of the bond. Source: FISD.

Negative Pledge Covenants: Dummy variable that equals one if the bond has negative pledge covenants. Source: FISD.

Offering Yield: Initial yield on the bond in percentage points. Source: TRACE.

B. Issuer

Debt/Capital: Total debt [dlcq +dlttq] / total capital [dlcq + dlttq + seqq], winsorized at [0,1]. Source: Compustat.

EBITDA/Total assets: EBITDA divided by total assets. Source: Compustat.

Issuance: Dummy variable that equals one if the issuer i issues at least one bond at time t, 0 otherwise. Source: eMAXX.

Issuance callable: Dummy variable that equals one if the issuer i issues at least one callable bond at time t, 0 otherwise. Source: eMAXX.

log(Sales): Natural logarithm of sales (saleq). Source: Compustat.

Last Call Delayed: Dummy that equals one if the last bond of issuer has been called with a delay. Source: TRACE.

Market-to-book ratio: (Market equity[prccq × cshoq] + total debt [dlcq +dlttq] + preferred [pstkq] + deferred taxes [txditcq]) / total assets [atq], winsorized at [1%, 99%]. Source: Compustat.

Previous Delay (3yr): Dummy variable that equals one if the firm has delayed a bond in the past 3 years, zero otherwise. Source: TRACE.

Tangible assets/Total assets: Tangible assets divided by total assets. Source: Compustat.

C. Funds

Insurance: Dummy taking value one if the fund is classified as an insurance in eMAXX ("Insurance Co-Diversified", "Insurance Co-Life/Health", or "Insurance Co-Prop & Cas" fund class), 0 if it is not. Source: eMAXX.

Mutual fund: Dummy taking value one if the fund is classified as an insurance in eMAXX ("MutFd-CE/Inv Tr/FCP", "MutFd-OE/UnitTr/SICAV/FCP", "Mutual Fund - Balanced", " Mutual Fund - Equity", "Mutual Fund - Money Mkt" or "Mutual Fund-Fund of Funds" fund class), 0 if it is not. Source: eMAXX.

Other: Dummy taking value one if the fund is in the issuer's bondholder base but does not hold the event bond, and zero if the fund holds the event bond. We measure the variable four years before the call event. Source: eMAXX.

Participate: Fraction of bonds issued by issuer i in year t in which bondholder f participates in the issuance quarter. Source: eMAXX.

Top 5 family: Dummy variable that equals one if the bondholder belongs to one of the top 5 largest fund families in the sample. Source: eMAXX.

D. Bondholder base of newly issued bonds

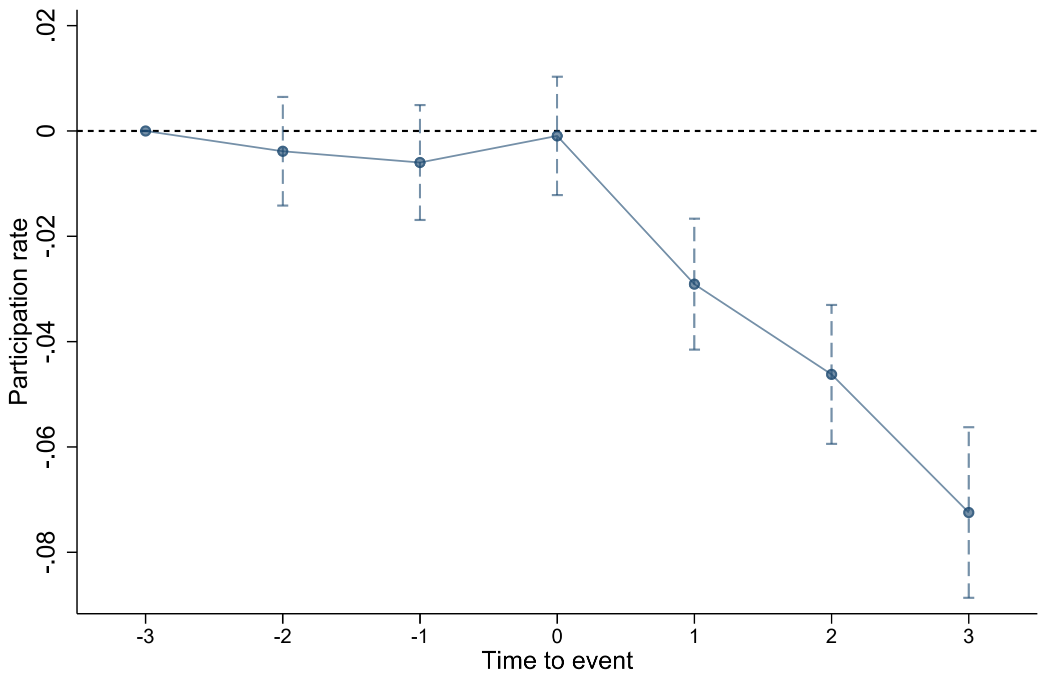
% of issuances to Top 5 (firm): Fraction of bond holdings of the newly issued bond(s) of issuer i at time t owned by top 5 family funds. Source: eMAXX.

Bondholder HHI: Herfindahl-Hirschmann index of bond holdings across fund families for the newly issued bond(s) of issuer i at time t. Source: eMAXX.

High Share Top 5: Dummy variable that equals one if the share of Top 5 fund families in the bondholder base of the called bond is larger than the sample median. Source: eMAXX.

Appendix B. Figures

Figure 1: Participation rates after fixed-price calls



Note: In this figure, we test whether after a fixed-price call, funds participate less in the issuer's subsequent bond issuances (Equation 1). The dots give the point estimates of the β_k coefficients and the bars the 95% confidence intervals. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. Standard errors are clustered at the fund level.

Appendix C. Tables

Table 1: Bond call characteristics

	N	Average
Callable	15,875	0.83
Make-whole callable	13,221	0.78
Fixed-price callable	13,221	0.64
MW and FP callable	13,221	0.43
Called	13,221	0.27
Fixed-price call	3,556	0.63
Make-whole call	3,556	0.37
Delay	1,276	0.43

Note: This table describes the call characteristics of US corporate bonds. We only include bonds present in Mergent FISD and eMAXXX issued by firms present in Compustat. We remove bonds from financial firms, government agencies, and firms domiciled outside the US. We also remove convertible bonds, preferred stock, exchangeable bonds, and bonds denominated in foreign currencies. *Make-whole callable*, *Fixed-price callable*, *MW and FP callable*, and *Called* are only defined for callable bonds. *Fixed-price call* and *Make-whole call* are only defined for called bonds. *Delay* is only defined for fixed-price callable bonds for which the option to call is in the money (i.e., for which the bond price exceeds the call price).

Table 2: Descriptive statistics

Variable	N	Mean	SD	P5	P25	P50	P75	P95
A. Event bonds								
Fixed-price call	1,390	0.72	0.45	0.00	0.00	1.00	1.00	1.00
Investment grade	1,390	0.82	0.39	0.00	1.00	1.00	1.00	1.00
Maturity (years)	1,390	10.00	6.52	4.61	7.02	9.26	10.01	30.02
Offering amount ($bn)	1,390	0.33	0.31	0.06	0.15	0.25	0.40	0.99
B. Issuer characteristics								
Debt/Capital	905	0.58	0.23	0.24	0.41	0.54	0.73	1.00
EBITDA/Total assets	905	0.03	0.03	0.01	0.02	0.03	0.04	0.07
Sales ($bn)	905	1.46	3.48	0.06	0.21	0.50	1.39	4.92
Market-to-book ratio	762	1.38	0.96	0.65	0.92	1.16	1.53	2.60
Tangible assets/Total assets	905	0.37	0.26	0.03	0.14	0.31	0.58	0.83
C. Funds								
Participate	28,735	0.11	0.28	0.00	0.00	0.00	0.00	1.00
Top 5 family	28,453	0.11	0.31	0.00	0.00	0.00	0.00	1.00
Insurance fund	28,735	0.40	0.49	0.00	0.00	0.00	1.00	1.00
Mutual fund	28,735	0.47	0.50	0.00	0.00	0.00	1.00	1.00
D. Bondholder base of newly issued bonds								
% of issuances to Top 5 family	507	0.15	0.13	0.00	0.06	0.13	0.21	0.35
Bondholder HHI	507	0.09	0.15	0.01	0.03	0.05	0.09	0.29

Note: This table gives the number of observations, the average, the standard deviation, and the 5, 25, 50, 75, and 95 percentiles of the variable's distribution. All the values are taken one year before the event (fixed-price or make-whole call). Panel A presents statistics on event bonds, that is, bonds that are called during the event year. Panel B presents statistics on the issuers. Panel C presents statistics on the funds that hold those bonds. Panel D presents statistics on the bondholder base of bonds issued the year before the call.

Table 3: Participation rates after fixed-price calls

	Participation			
	(1)	(2)	(3)	(4)
Post × Fixed-price Call	-0.017***	-0.016***	-0.014***	-0.017***
	(0.003)	(0.004)	(0.004)	(0.005)
Fixed Effects				
Fund × Event FE	✓	✓	✓	✓
Year FE	✓	✓	–	✓
Year to event FE	✓	✓	✓	✓
Issuer controls	–	✓	–	–
Rating × Year	–	–	✓	–
Sample restrictions				
Rating changes?	Y	Y	Y	N
Observations	160,184	134,389	139,899	64,174

Note: In this table, we test whether after a fixed-price call, funds participate less in the issuer's subsequent bond issuances using various specifications (Equation (2)). The table reports the point estimates of the β coefficient as well the standard error around the coefficients. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. In column 4, we restrict the sample to issuers that did not experience changes in ratings in the three years preceding the event year, event year included.

Table 4: Participation rates and lender characteristics

	Participation			
	(1)	(2)	(3)	(4)
Post × Fixed-price Call	-0.014***	-0.010**		
	(0.004)	(0.004)		
Post × Fixed-price Call × Top 5 Family	-0.031**	-0.035***	-0.033***	-0.028**
	(0.012)	(0.013)	(0.012)	(0.013)
Fixed Effects				
Event FE	✓	✓	✓	✓
Year to event FE	✓	✓	✓	✓
Year FE	✓	–	–	–
Rating × Year FE	–	✓	–	–
Issuer × Year FE	–	–	✓	✓
Controls				
Fund characteristics	–	–	–	✓
Observations	160,184	139,899	160,170	160,170

Note: In this table, we test whether funds in Top 5 fund families are more likely to stop participating in the issuer's subsequent bond issuances after a fixed-price call (Equation (3)). The table reports the point estimates of the β and the ρ coefficients as well as the standard errors around the point estimates. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). Fund characteristics include dummies indicating whether the firm is an insurance fund, a mutual fund, or one of the issuer's top 3 bondholders, as well as the fund's total bond holdings (in logarithm). Fund characteristics are all interacted with *Post*, *Fixed-Price Call*, and *Post* × *Fixed-Price Call*. All the other variables are described in Appendix A. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table 5: Bondholder base of newly issued bonds

	% of issuances to Top 5			
	(1)	(2)	(3)	(4)
Post × Fixed-Price Call	-0.030***	-0.028***	-0.012	-0.004
	(0.008)	(0.010)	(0.011)	(0.014)
Post × Fixed-Price Call × High Share Top 5			-0.033**	-0.047***
			(0.013)	(0.016)
High Share Top 5			-0.015	-0.017
			(0.025)	(0.026)
Post × High Share Top 5			0.001	-0.003
			(0.012)	(0.011)
Fixed-Price Call × High Share Top 5			0.018	0.022
			(0.034)	(0.037)
Fixed Effects				
Issuer × Event FE	✓	✓	✓	✓
Year to event FE	✓	✓	✓	✓
Year FE	✓	–	✓	–
Rating × Year FE	–	✓	–	✓
Observations	2,503	2,503	3,085	2,503

Note: In this table, we test whether the bondholder base composition of newly issued bonds changes after a fixed-price call (Equation (5)). The table reports the point estimates of the β coefficients as well as the standard errors around the point estimates. The event is a fixed-price call for treated firms, a make-whole call for control firms. *High Share Top 5* is a dummy if the share of Top 5 fund families in the bondholder base of the called bond is larger than the sample median. All the variables are described in Appendix A. Standard errors are clustered at the issuer level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table 6: Other bondholders

	Participation			
	(1)	(2)	(3)	(4)
Post × Fixed-price Call	-0.006***	-0.015***	-0.009***	-0.010***
	(0.001)	(0.003)	(0.003)	(0.003)
Post × Fixed-price Call × Other		0.011***	0.013***	0.012***
		(0.003)	(0.003)	(0.004)
Fixed Effects				
Fund × Event FE	✓	✓	✓	✓
Bondholder type × Year to event FE	✓	✓	✓	✓
Year FE	✓	✓	–	–
Rating × Year	–	–	✓	–
Issuer × Year	–	–	–	✓
Observations	709,875	709,875	709,875	709,875

Note: In this table, we test whether funds in the issuers' bondholder base react differently to calls depending on whether they hold the event bond or not (Equation (**??**)). The table reports the point estimates of the β and the ρ coefficients as well as the standard errors around the point estimates. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table 7: Call delay and bondholder base composition

	Delay		
	(1)	(2)	(3)
Share of Top 5 Family		0.224***	0.175**
		(0.076)	(0.081)
Profitability	-1.485***	-1.616***	-1.382***
	(0.510)	(0.529)	(0.494)
Tangibility	0.006	0.021	-0.011
	(0.049)	(0.044)	(0.043)
Log(Sales)	0.022*	0.027**	0.011
	(0.012)	(0.013)	(0.011)
Book Leverage	0.091	0.114*	0.162**
	(0.055)	(0.059)	(0.071)
log(Offering Amount)			0.014*
			(0.007)
Negative Pledge Covenant			0.033
			(0.030)
Fixed Effects			
Year-Quarter	✓	✓	✓
Rating FE	–	–	✓
Observations	1,972	1,806	1,459

Note: In this table, we test whether the bondholder base composition affects the decision to delay a call (Equation (6)). The table reports the point estimates of the Γ coefficients as well as the standard errors around the point estimates. All the variables are described in Appendix A. Standard errors are clustered at the industry (2-digit SIC) level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table 8: Persistence of call delays

	Delay			
	(1)	(2)	(3)	(4)
Previous Delay (3yrs)	0.270***	0.266***		
	(0.032)	(0.054)		
Last Call Delayed			0.249***	0.251***
			(0.029)	(0.035)
Profitability	-1.359	-1.608*	-1.325	-1.590*
	(0.942)	(0.840)	(0.884)	(0.826)
Tangibility	0.030	-0.068	0.027	-0.050
	(0.064)	(0.065)	(0.055)	(0.054)
Log(Sales)	0.024*	0.000	0.025**	0.005
	(0.013)	(0.013)	(0.012)	(0.012)
Book Leverage	0.104*	0.199**	0.116**	0.214***
	(0.059)	(0.085)	(0.052)	(0.076)
log(Offering Amount)		0.020***		0.017***
		(0.003)		(0.003)
Negative Pledge Covenant		0.061		0.064*
		(0.038)		(0.036)
Fixed Effects				
Year-Quarter	✓	✓	✓	✓
Rating FE	–	✓	–	✓
Observations	1,176	951	1,176	951

Note: In this table, we test whether firms tend to systematically delay calls (Equation (6)). The table reports the point estimates of the Γ coefficients as well as the standard errors around the point estimates. All the variables are described in Appendix A. Standard errors are clustered at the industry (2-digit SIC) level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table 9: Bond pricing

	Offering Yield		
	(1)	(2)	(3)
Log(Maturity)	4.637***	4.633***	4.554***
	(0.186)	(0.184)	(0.217)
Negative Pledge	0.001	0.002	0.024
	(0.046)	(0.046)	(0.037)
Log(Bond Size)	0.019	0.019	0.031
	(0.038)	(0.037)	(0.023)
Fixed-Price Call	0.374***	0.384***	0.523***
	(0.048)	(0.047)	(0.050)
Previous Delay (3yrs)		0.107	0.055
		(0.135)	(0.130)
Fixed-Price Call × Previous Delay (3yrs)		-0.351*	-0.312*
		(0.193)	(0.186)
Fixed Effects			
Year-quarter	✓	✓	–
Industry	✓	✓	✓
Rating	–	✓	–
Date × Rating	–	–	✓
Observations	6,259	6,259	5,839

Note: In this table, we test whether bond prices reflect past call delays (Equation (8)). Only callable bonds are included in the sample. The table reports the point estimates of the β coefficients as well as the standard errors around the point estimates. All the variables are described in Appendix A. Standard errors are clustered at the industry (2-digit SIC) level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Appendix for Online Publication:

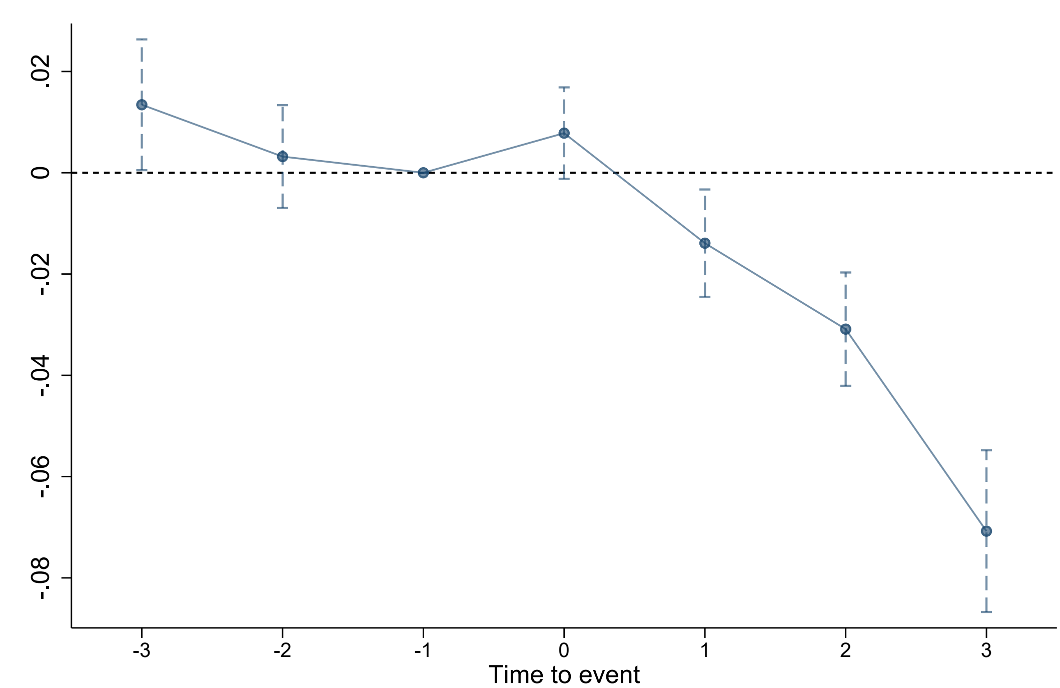
Relationship Lending in Bond Markets? Evidence from Corporate Call Policies

Paul Beaumont, David Schumacher, Gregory Weitzner

This internet appendix presents additional results to accompany the paper "Relationship Lending in Bond Markets? Evidence from Corporate Call Policies."

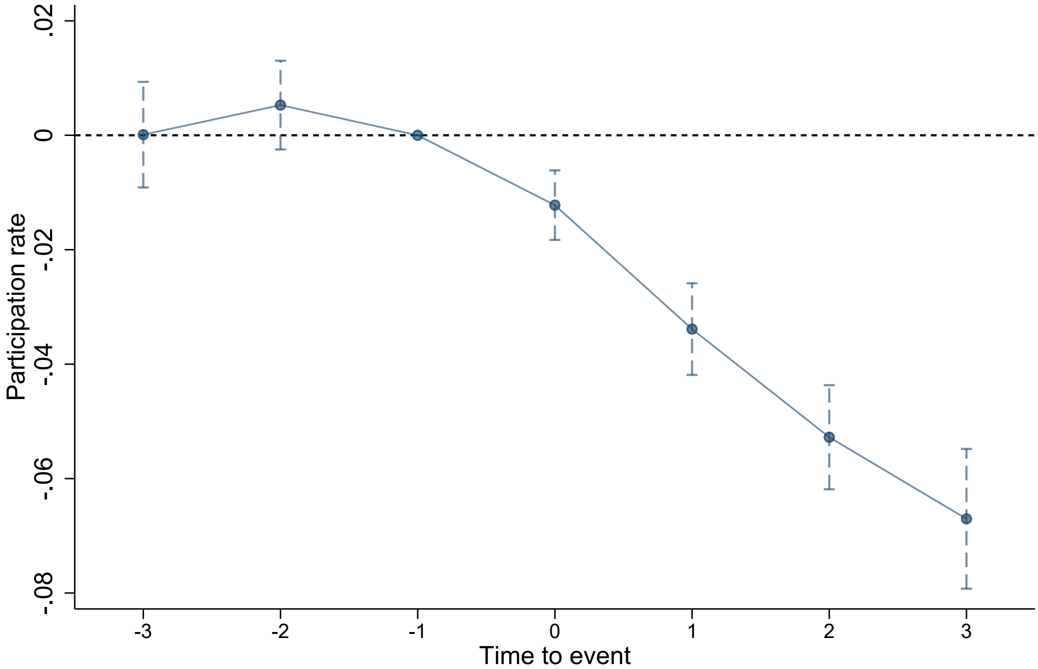
Online Appendix A. Additional Tables and Figures

Figure A1: Participation rates after fixed-price calls - Stacked regression



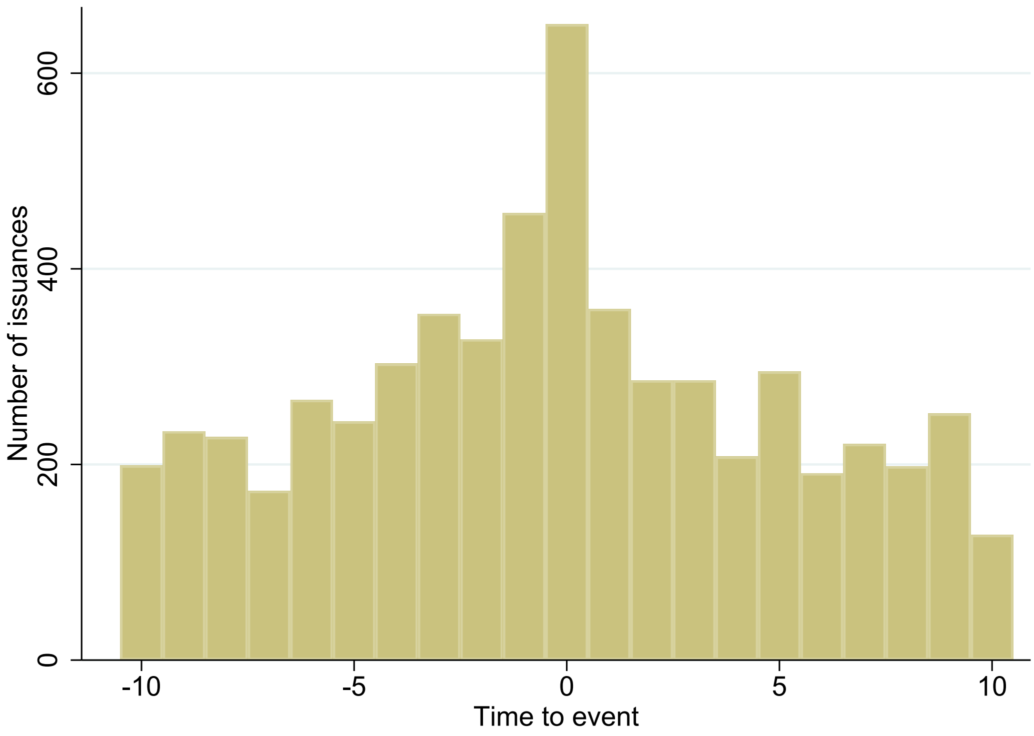
Note: In this figure, we test whether after a fixed-price call, funds participate less in the issuer's subsequent bond issuances (Equation (1)). The dots give the point estimates of the β_k coefficients and the bars the 95% confidence intervals. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). The dynamic difference-in-difference estimates are obtained following Gormley and Matsa (2011) ("stacked regression"). All the other variables are described in Appendix A. Standard errors are clustered at the fund level.

Figure A2: Participation rates after fixed-price calls, using matured bonds as control bonds



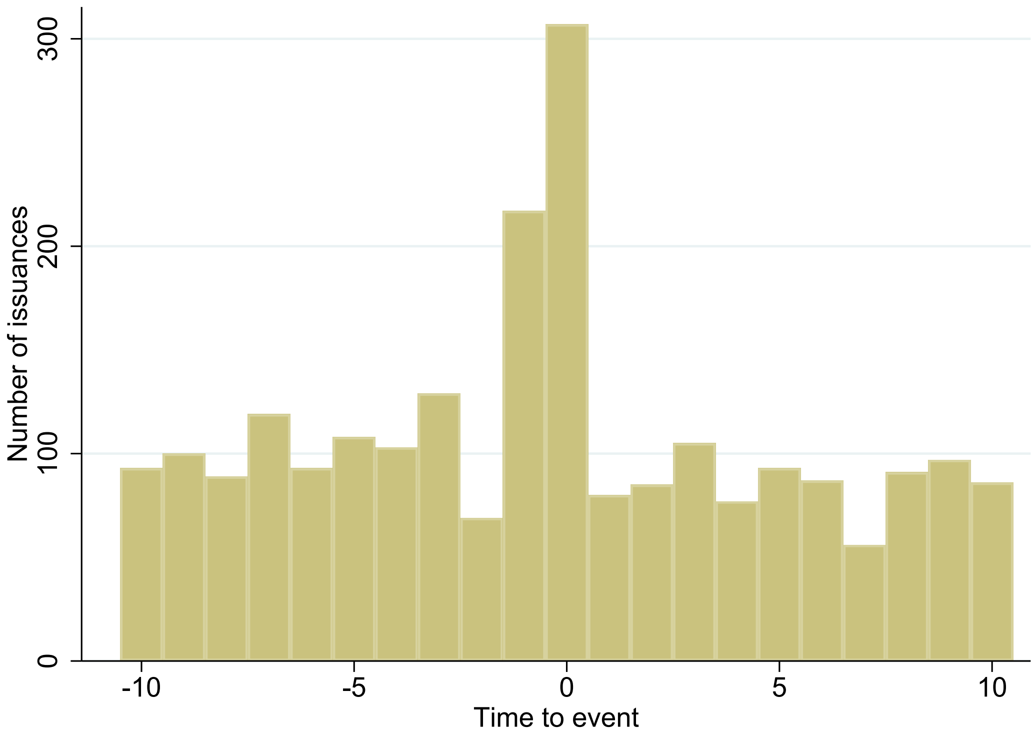
Note: In this figure, we test whether after a fixed-price call, funds participate less in the issuer's subsequent bond issuances (Equation (1)). The dots give the point estimates of the β_k coefficient and the bars the 95% confidence intervals. The event is a fixed-price call for treated funds, a bond repayment at maturity for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. Standard errors are clustered at the fund level.

Figure A3: Distribution of issuances - Fixed-price calls



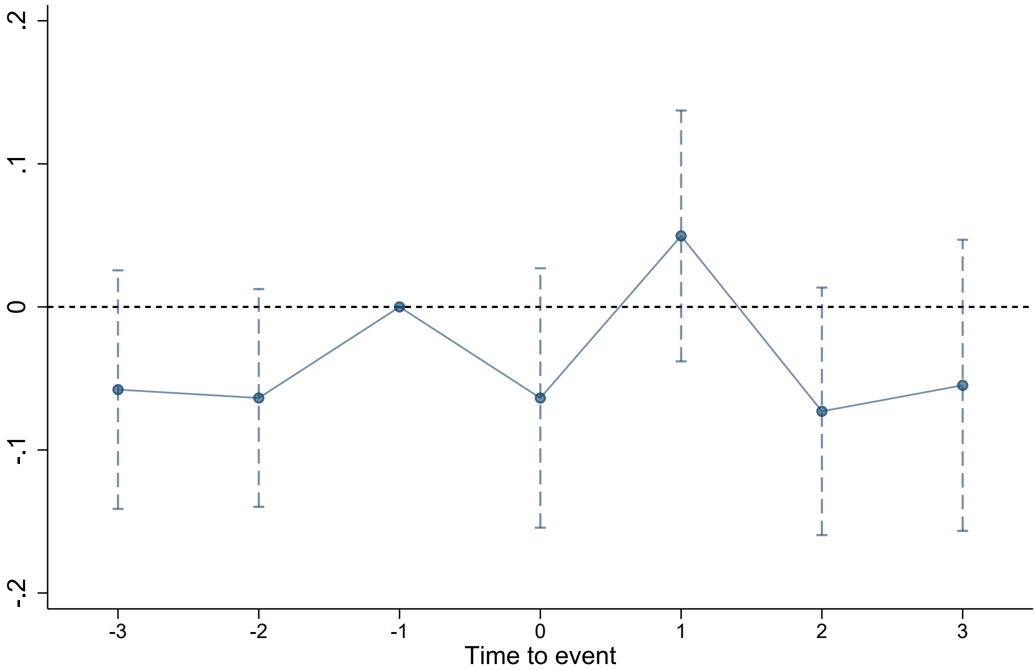
Note: The figure presents the distribution of the number of bond issuances in the ten quarters preceding and following fixed-price calls.

Figure A4: Distribution of issuances - Make-whole calls



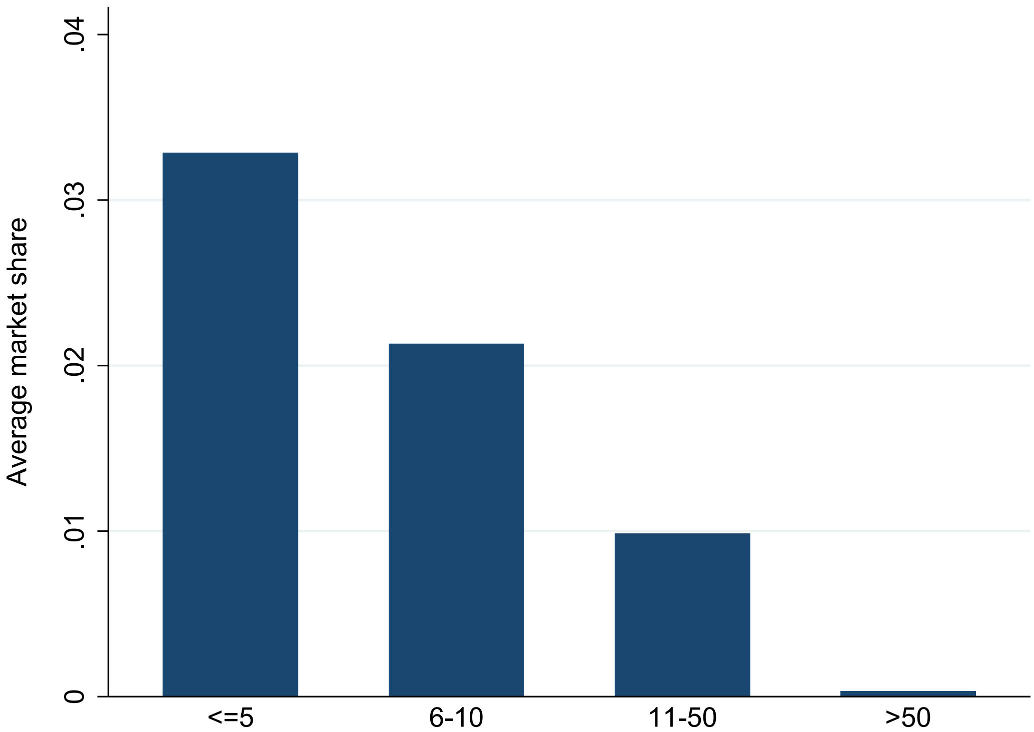
Note: The figure presents the distribution of the number of bond issuances in the ten quarters preceding and following make-whole calls.

Figure A5: Event study - Issuance



Note: In this figure, we test whether after a fixed-price call, firms issue fewer bonds. The regression includes issuer $\times$ event fixed effects, year-to-event fixed effects, and year fixed effects. The dots give the point estimates of the coefficient, and the bars the 95% confidence intervals. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. Standard errors are clustered at the fund level.

Figure A6: Top families' market shares



This figure presents the average market share (i.e., the fraction of total amount of bond holdings in the US corporate bond market held by the fund family) of fund families in the top 5, 6-10, 11-50, or outside of the top 50.

In Appendix Table A1, we conduct several additional robustness tests for our main result in Table 3 that existing bondholders are less likely to participate in a new issuance after a fixed-price call. In column 1, we include the baseline result for reference.

One concern could be that funds' positions in fixed-price bonds systematically differ from that in make-whole bonds. For instance, if funds invest systematically less in fixed-price bonds than in make-whole bonds, lower participation rates following fixed-price calls could arise simply because treated funds have less money to reallocate after the call. Therefore, in column 2 we augment the specification by splitting funds in ten deciles of bond holdings size and interacting decile fixed effects $\textit{Holding size}_{f,i,t0-1}$ with time-to-event dummies. Bond holdings size is measured one year before the event. Including interacted bond holding size fixed effects ensures that we only compare funds that are similarly invested in the event bond when identifying the effects of fixed-price calls on issuance participation.

In column 3, we show that our results are also robust to controlling for fund $\times$ year fixed effects which absorb any differential shocks that may hit funds that invest more in fixed-price versus make-whole calls. This specification requires that funds must hold enough bonds of firms that call their bonds in a given year for the coefficient to be precisely estimated. For this reason, we impose that funds hold bonds of at least ten such issuers. The estimate is close to the baseline value and significant at the 10% level, suggesting that the drop in participation rates does not come from differential investment dynamics by funds that invest in bonds that were called by fixed-price versus make-whole.

In column 4, we impose that all bonds feature make-whole call provisions (even if they are ultimately called via fixed-price) to reduce the scope for contractual differences between bonds called via fixed-price and make-whole that could become salient at the time of the call (e.g., maturity or covenants). Our main estimate is unchanged.

Finally in column 5, we show that our results are robust to using a dummy variable that equals one if the fund participates in *any* bond that is issued by the firm in that year as the dependent variable.

Table A1: Robustness

	Participation				1(Participation)
	(1)	(2)	(3)	(4)	(5)
Post × Fixed-price Call	-0.017***	-0.017***	-0.013*	-0.020***	-0.019***
	(0.003)	(0.003)	(0.007)	(0.004)	(0.004)
Fixed Effects					
Fund × Event FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Year to event FE	✓	–	✓	✓	✓
Holding decile × Year to event FE	–	✓	–	–	–
Fund-Year FE	–	–	✓	–	–
Sample restrictions					
Min. # of event bonds per fund	1	1	10	1	1
Make-whole provisions?	N	N	N	Y	N
Observations	160,184	160,184	49,257	140,075	160,184

Note: In this table, we test whether after a fixed-price call, funds participate less in the issuer's subsequent bond issuances using various specifications (Equation (2)). The table reports the point estimates of the β coefficient as well the standard error around the coefficients. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. In column 3, we impose that funds hold at least 10 events bonds to be included in the sample. In column 4, we impose that all the bonds in the sample can be called via make-whole. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table A2: Participation rates after fixed-price calls, using matured bonds as control bonds

	Participation							1(Participation)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Fixed-price Call	-0.031***	-0.032***	-0.018***	-0.024***	-0.031***	-0.027***	-0.041***	-0.037***
	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.006)	(0.005)	(0.004)
Fixed Effects								
Fund × Event FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	–	✓	✓	✓	✓	✓
Year to event FE	✓	✓	✓	✓	–	✓	✓	✓
Issuer controls	–	✓	–	–	–	–	–	–
Rating × Year	–	–	✓	–	–	–	–	–
Holding size decile × Year to event FE	–	–	–	–	✓	–	–	–
Fund-Year FE	–	–	–	–	–	✓	–	–
Sample restrictions								
Rating changes?	Y	Y	Y	N	Y	Y	Y	Y
Min. # of event bonds per fund	1	1	1	1	1	10	1	1
Only fixed-price provisions?	N	N	N	N	N	N	Y	N
Observations	358,623	289,761	322,842	149,048	358,623	164,164	98,050	358,623

Note: In this table, we test whether after a fixed-price call, funds participate less in the issuer's subsequent bond issuances using various specifications (Equation (2)). The table reports the point estimates of the β coefficient as well the standard error around the coefficients. The event is a fixed-price call for treated funds, a bond repayment at maturity for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. In column 4, we restrict the sample to issuers that did not experience changes in ratings in the three years preceding the event year, event year included. In column 6, we impose that funds hold at least 10 events bonds to be included in the sample. In column 7, we impose that all bonds in the sample can be called via fixed-price. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table A3: Alternative clusters

	Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
$1(k > 0) \times$ Fixed-price Call	-0.039***	-0.039***	-0.039**	-0.039**	-0.039***	-0.039**
	(0.004)	(0.012)	(0.019)	(0.019)	(0.014)	(0.014)
$1(k = 0) \times$ Fixed-price Call	0.004	0.004	0.004	0.004	0.004	0.004
	(0.004)	(0.007)	(0.012)	(0.010)	(0.013)	(0.011)
Fixed Effects						
Fund × Event FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Year to event FE	✓	✓	✓	✓	✓	✓
Cluster	Fund	Fund + Year	Issuer	Issuer + Year	Market	Market + Year
N	160,184	160,184	160,184	160,184	160,184	160,184

Note: This table gives the results of the estimation of Equation (2). The table reports the point estimates of the β coefficient as well as the standard error around the coefficients with different clustering methods ("+" means double clustering). The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table A4: Fixed-price calls and bond issuances

	Issuance		Issuance of callable bonds		log(Issuance Amount)	
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Fixed-Price Call	-0.022	0.004	-0.028	-0.002	-0.018	-0.008
	(0.018)	(0.023)	(0.019)	(0.023)	(0.056)	(0.051)
Fixed Effects						
Issuer × Event FE	✓	✓	✓	✓	✓	✓
Year to event FE	✓	✓	✓	✓	✓	✓
Year FE	✓	–	✓	–	✓	–
Rating × Year FE	–	✓	–	✓	–	✓
Observations	10,538	6,992	10,538	6,992	4,790	3,284

In this table, we test whether issuers are more likely to issue bonds or callable bonds after a fixed-price call (Equation (5)). The table reports the point estimates of the β coefficients as well as the standard errors around the point estimates. The event is a fixed-price call for treated firms, a make-whole call for control firms. All the variables are described in Appendix A. Standard errors are clustered at the issuer level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table A5: Fund-level participation rates

	Participation rate	
	(1)	(2)
Top 5 Family	0.045***	0.015**
	(0.007)	(0.006)
Top 6-10 Family	0.029***	0.007
	(0.006)	(0.005)
Top 11-50 Family	0.022***	0.002
	(0.003)	(0.003)
log(Total fund holdings)		0.019***
		(0.000)
Fixed Effects		
Year FE	✓	✓
Observations	91,181	91,181

In this table, we test whether funds in Top 5 fund families are likely to participate to a greater fraction of the issuer's bond issuances. The participation rate is defined as the fraction of outstanding bonds by issuer i in year t in which bondholder f participates. All the variables are described in Appendix A. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table A6: Other bondholders - Top 5

	Participation			
	(1)	(2)	(3)	(4)
Post × Fixed-price Call	-0.006	-0.041***	-0.032***	-0.037***
	(0.005)	(0.011)	(0.012)	(0.013)
Post × Fixed-price Call × Other		0.045***	0.046***	0.038***
		(0.012)	(0.012)	(0.013)
Fixed Effects				
Fund × Event FE	✓	✓	✓	✓
Bondholder type × Year to event FE	✓	✓	✓	✓
Year FE	✓	✓	–	–
Rating × Year	–	–	✓	–
Issuer × Year	–	–	–	✓
Observations	71,434	71,434	71,432	71,392

Note: In this table, we test whether Top 5 funds in the issuers' bondholder base react differently to calls depending on whether they hold the event bond or not (Equation (**??**)). The table reports the point estimates of the β and the ρ coefficients as well as the standard errors around the point estimates. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.

Table A7: Other bondholders - Outside of Top 5

	Participation			
	(1)	(2)	(3)	(4)
Post × Fixed-price Call	-0.006***	-0.011***	-0.007*	-0.006*
	(0.001)	(0.004)	(0.003)	(0.003)
Post × Fixed-price Call × Other		0.006*	0.010***	0.008**
		(0.004)	(0.004)	(0.004)
Fixed Effects				
Fund × Event FE	✓	✓	✓	✓
Bondholder type × Year to event FE	✓	✓	✓	✓
Year FE	✓	✓	–	–
Rating × Year	–	–	✓	–
Issuer × Year	–	–	–	✓
Observations	638,441	638,441	638,441	638,441

Note: In this table, we test whether non-top 5 funds in the issuers' bondholder base react differently to calls depending on whether they hold the event bond or not (Equation (**??**)). The table reports the point estimates of the β and the ρ coefficients as well as the standard errors around the point estimates. The event is a fixed-price call for treated funds, a make-whole call for control funds. The participation rate is defined as the fraction of bonds issued by issuer i in year t in which bondholder f participates (as measured during the issuance quarter). All the other variables are described in Appendix A. Standard errors are clustered at the fund level. *, ** and *** indicate statistical significance at 10, 5, and 1% levels, respectively.