Go with the Flow: Debt Structure Changes and Monetary Policy Transmission*

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December 2025

Abstract

Fixed-income mutual fund flows have become a key determinant of corporate debt structure. When loan funds receive more inflows than bond funds, firms cater by shifting toward floating-rate loans over fixed-rate bonds. Using fund flows as an instrument, we show that the exposure to floating-rate debt has a much larger effect on firm sensitivity to monetary policy than previous OLS estimates, accounting for about $1 trillion reduction in capital expenditures during the 2022-23 tightening cycle. We find evidence in support of the financial accelerator mechanisms, particularly the effect of interest coverage constraints.

Keywords: mutual fund flows, corporate debt structure, real investment, interest rate sensitivity

*Previously titled "Go with the Flow: Debt Structure Changes and Real Implications." We thank discussions by Jaewon Choi, Vasso Ioannidou, Raymond Kim, Marco Rossi, Roman Sigalov, Mingzhu Tai and comments and suggestions from conference and seminar participants at CHWIRC, CICF, EasternFA, EuropeanFA, MFA, NHH CCF Conference, SBFC, SFA, UConn Finance Conference, WFS Asia, Clemson, Miami, Penn State, UNLV, USF, and Wharton.

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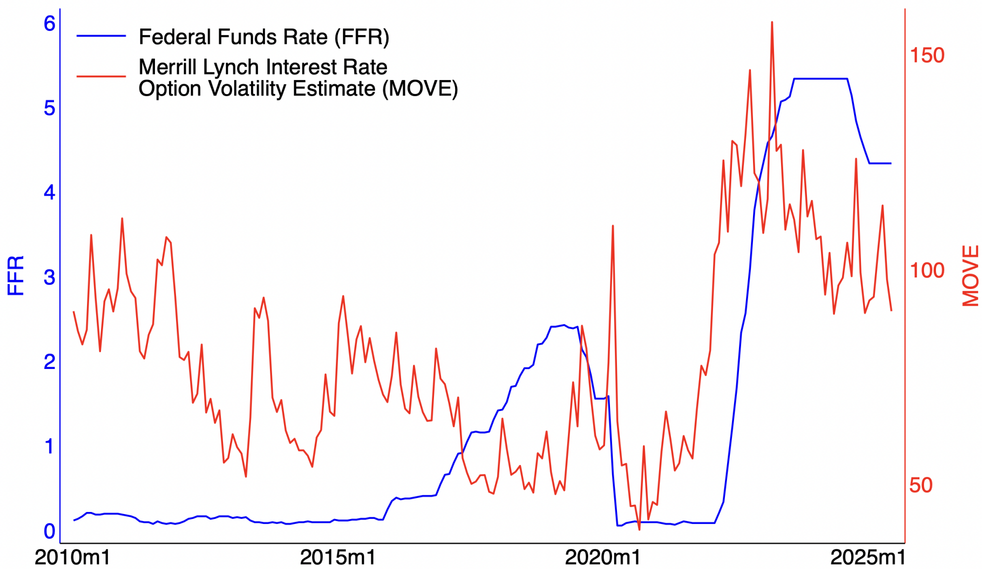
1 Introduction

Interest-rate volatility has returned in recent years. As shown in the figure below, the federal funds rate remained at the zero lower bound for the majority of the 2010s but rose sharply in 2022 by 5 percentage points in less than 18 months, constituting one of the most aggressive monetary tightening episodes in history. Persistent inflation and concerns about central bank independence under the Trump administration have added considerable uncertainty about the path of future short rates. At year-end 2024, Merrill Lynch's options-implied interest rate volatility stood at a level nearly twice its pre-COVID level.



How do firms respond to changes in short-term interest rates? One key factor is the structure of firms' debt, particularly the share that is floating rate or set to mature in the near term. For example, after the recent 5 p.p. rate increase, a firm with 50% leverage financed entirely with floating-rate debt would experience an increase in interest expenses rise by 2.5% of assets more than a firm relying solely on long-term fixed-rate debt, which is considerable given that the average return on assets is around 10% (Table 1). Higher interest expenses reduces firms' internal resources and can weaken balance sheets, potentially amplifying frictions in raising external finance.

This observation naturally raises the question of how firms choose their debt structures. In this paper, we study the rise of fixed-income mutual funds since 2010 and show that relative flows into bond and loan funds have become a key determinant of firms' choices between fixed-rate and floating-rate debt. We then use this supply-driven variation in debt structure to causally identify how corporate debt structure shapes the transmission of monetary policy to firms' real activities.

We focus on U.S. publicly traded speculative-grade firms, which finance themselves with a mix of floating-rate loans and fixed-rate bonds. This funding variability enables us to disentangle the effects of debt structure (floating- versus fixed-rate debt) from the effect of capital structure (equity versus debt). Our analysis also exploits the rise of fixed income mutual funds and ETFs as important corporate lenders since the 2008 Global Financial Crisis. These funds report security-level holdings and monthly investor flows, enabling us to construct *firm-specific* credit supply shocks. Using these firm-specific credit supply shocks as instruments, we revisit the floating-rate channel of monetary policy and show that floating-rate debt amplifies firms' sensitivity to interest rates far more than previously estimated.

We begin by showing a strong aggregate time series correlation between relative flows into loan funds versus bond funds and speculative-grade firms' issuance choices. Periods with higher inflows to loan funds or higher outflows from bond funds coincide with firms issuing relatively more loans than bonds, a pattern that is visibly strong throughout the last 15 years. These issuance responses are sufficiently strong to translate into changes in the structure of *outstanding* debt. Higher relative loan fund flows are associated with increases in the share of loans – and correspondingly, the share of floating-rate debt – in aggregate corporate debt outstanding.

To strengthen the causal interpretation of fund flows on debt structure, we construct a *firm-specific* measure of fund flows and examine the link between flows and debt structure in the *cross section* of firms. The measure builds on two behaviors of fixed income mutual funds.

First, funds hold relatively concentrated portfolios, typically investing in only 10%-20% of outstanding issuers. Second, funds scale their existing investments nearly proportionally in response to both inflows and outflows. Together, these features imply that a firm is disproportionately exposed to the flows of its *existing* debt holders. We exploit this exposure to construct a firm-specific flow measure based on ex ante fund ownership, which captures the mechanical buying or selling pressure a firm would face if existing funds scaled their portfolios proportionally, excluding discretionary trading by fund managers.

We show that our measures of loan and bond supply are economically and statistically significant determinants of debt structure choices in the *cross section* of speculative-grade firms. When firms' existing loan-fund investors experience larger inflows, or their bond-fund investors experience larger outflows, firms become more likely to issue loans rather than bonds. These issuance responses are large enough to translate into meaningful changes in firms' *outstanding* debt. According to our estimates, a $1 increase in loan-fund flows, or a $1 decrease in bond-fund flows, raises firms' floating-rate debt outstanding by about $0.6. Since the regression includes leverage-time and industry-time fixed effects, the estimate is based on a comparison among firms in the same quarter with the same leverage in the same industry, but with different exposure to fund flows through their pre-existing relationships.

We provide evidence that these flow-induced debt structure changes reflect firms' catering efforts to lower their cost of capital. Higher loan fund flows are associated with lower offering spreads on newly issued loans, higher bond fund flows are associated with lower offering spreads on newly issued bonds, and there is limited spillover across the two markets. The fact that borrowing costs and borrowing quantities move in opposite directions reinforces the interpretation that our fund-flow measure captures shifts in credit supply rather than changes in firms' demand for financing.

Although it reduces the cost of capital, catering to fund flows alters firms' debt structures and exposes them to subsequent interest rate shocks. In a reduced-form regression of capital expenditures on two-year lagged fund flows, we estimate that firms with 1 p.p. higher loan fund flows (bond fund flows) decrease (increase) investment by 0.101% (0.088%) of total assets in response to a 1 p.p. increase in the federal funds rate. These results are consistent with prior findings that high-risk firms have limited ability to hedge with derivatives due to collateral constraints and counterparty risk (Rampini and Viswanathan, 2010; Cenedese et al., 2020). Our subsequent instrumental variable analysis provides a structural interpretation of the coefficients.

Using lagged fund flows as an instrument for current debt structure, we revisit the floating-rate channel of monetary policy, namely how exposure to floating-rate or maturing debt affects firms' sensitivity to interest-rate changes. Prior research has relied on observed debt structures (e.g., Ippolito et al., 2018), which can be endogenously chosen by firms to *offset* exposure to interest rates arising from other parts of firms' balance sheets. For example, firms in more pro-cyclical industries tend to have operating cash flows that comove more strongly with interest rates, and we indeed observe that they use more floating-rate debt. In contrast, fund flows are likely exogenous to firms' balance sheets, allowing us to provide a causal estimate of the floating-rate channel.

The instrumental variables results indicate that debt structure has a much larger effect on firms' investment sensitivity to interest rates than conventional OLS estimates suggest. In response to 1 p.p. increase in the federal funds rate, firms with only floating-rate debt reduce capital expenditures by 11.8% of total assets more than firms with fully fixed-rate debt. In contrast, the corresponding OLS estimate implies a reduction of only 0.9% of total assets. Interpreting the difference as reflecting the downward bias in OLS due to the endogeneity of observed debt structures, our findings suggest a much larger role for the floating-rate channel of monetary policy than previously documented.

To further understand the magnitude of our estimate, we examine how other cash-flow variables respond to changes in interest rates. As expected, interest expense increases more for firms with greater exposure to floating-rate debt, which reduces the internal resources available for investment. However, most of the decrease in capital expenditures can be explained by a reduction in *new* debt issuance, which shows a similar wedge in interest rate sensitivity between floating-rate vs. fixed-rate firms. This pattern aligns with financial-accelerator models, in which higher interest payments on *existing* floating-rate debt weaken firms' balance sheets and amplify frictions in accessing *new* external finance (Bernanke et al., 1999).

One channel through which interest-rate increases translate into tighter financial constraints is the active management of interest coverage. As shown by (Greenwald, 2019), most credit agreements require borrowers to maintain operating cash flows at least two to three times their interest expenses, and many speculative-grade firms operate near this threshold. Managing interest coverage, therefore, could have large implications for debt issuance. During the recent hike in short-term rates, for example, interest rate expenses for a typical speculative-grade firm roughly doubled.[1] To keep interest coverage constant, such a firm would need to reduce its debt outstanding by one-half. Consistent with this mechanism, when allowing the investment sensitivity to vary with firms' interest coverage, we find that the sensitivity is concentrated in firms with the lowest coverage, who are most likely to approach or violate existing constraints.

We corroborate our findings using high-frequency stock returns around FOMC announcements. This analysis, while making strong assumptions on the efficiency of the stock market, provides an independent check using equity investors' assessment of how interest rate changes affect firms. Instrumenting for firms' floating-rate exposure with fund flows, we show that firms with more floating-rate debt experience worse stock returns in response to positive monetary policy surprises. As with the capital expenditure results, the IV estimates are

[1] The average interest rate spread on a leveraged term loan is about 400 basis points. Assuming a firm with a SOFR floor of 50 basis points and an increase in SOFR from 0 to 500 basis points, the applicable interest rate would increase from 450 basis points to 900 basis points.

substantially larger than the OLS estimates, confirming the conclusion that debt structure plays a quantitatively important role in shaping firms' responses to monetary policy.

We conclude by using our estimates to quantify the *aggregate* impact of debt structure during the recent interest rate tightening. The largest publicly traded firms use almost exclusively fixed-rate debt, but smaller public firms and private firms rely quite heavily on floating-rate loans. Using our IV estimates, we compute counterfactual capital expenditures for each public firm and all private firms under the scenario in which all debt had been fixed-rate prior the rate hike. Under this counterfactual, aggregate capital expenditures during 2022-23 would have been $0.94 trillion larger, an increase of 17% relative to actual investment.

1.1 Contribution to Existing Literature

We contribute to three strands of literature. First, we advance the understanding of the determinants of corporate debt structure, an important but relatively under-studied dimension of corporate capital structure. Much of the existing work focuses on rollover risk and the choice between short- and long-term debt (e.g., Barclay and Smith Jr., 1995; Baker et al., 2003; Greenwood et al., 2010; Erel et al., 2011; Badoer and James, 2016; Xu, 2017; Choi et al., 2018; Chen et al., 2021). Other studies distinguish loans from bonds based on relative monitoring intensity or contractual flexibility (e.g., Diamond, 1991; Rajan, 1992; Bolton and Scharfstein, 1996; Crouzet, 2017). In contrast, we emphasize the difference in interest-rate exposure between loans and bonds and show that relative flows to fixed-income mutual funds have become a key driver of firms' choice between floating-rate loans and fixed-rate bonds.

Our paper complements Becker and Ivashina (2014) and Massa and Zhang (2021), which also link credit supply to firms' financing choices. Becker and Ivashina (2014) show that aggregate measures of bank credit supply comove with firms' choice between loans and bonds, and Massa and Zhang (2021) show that insurance losses from Hurricane Katrina led firms to shift from bonds to loans when the supply of bond capital contracted. We build on this work by showing that fixed income mutual funds have become a major player in the corporate lending market and their flows strongly affect debt structure choices in both aggregate time series and in the cross section of firms. Our measure of *firm-specific* fund flows consistently predicts both firms' issuance choices and the composition of their overall balance sheets. Moreover, we show that catering to credit supply creates a tradeoff in which firms lower their *current* cost of capital but deviate from their natural debt structure, leaving them more exposed to *future* interest-rate shocks.

Second, we contribute to the growing literature on the real effects of mutual fund flows (Edmans et al., 2012; Lou, 2012; Zhu, 2021; Coppola, 2022; Barbosa and Ozdagli, 2022; Adelino et al., 2023; Fang, 2025). Most existing studies focus on a single market (e.g., corporate bonds) and examine the *direct* impact of fund flows on pricing or issuance in that market. In contrast, we show that the relative flows into loan funds versus bond funds shape firms' choice across the two markets. Fund flows affect not just new issuance, but also the composition of firms' debt outstanding. Moreover, we are among the first to uncover the *indirect* effects of fund flows. *Past* fund flows alter the mix of floating-rate loans versus fixed-rate bonds, which in turn affects how firms respond to *future* interest rate changes.

Finally, our paper provides causal evidence for the floating-rate channel of monetary policy, namely how exposure to floating-rate or maturing debt affects firms' sensitivity to changes in short-term interest rates (Ippolito et al., 2018; Gurkaynak et al., 2022; Deng and Fang, 2022; Jungherr et al., 2022; Core et al., 2025). By restricting the sample to firms with a speculative-grade credit rating and controlling for granular leverage fixed effects in regressions, we isolate the effect of debt *structure* separately from the effect of the *level* of debt, which has an independent effect on firms' sensitivity to interest rates (Ottonello and Winberry, 2020). More importantly, we depart from existing studies that rely on firms' observed debt structures, which can be endogenously chosen by firms to offset the interest-rate sensitivity of their operating cash flows, and such endogenous adjustment can attenuate OLS estimates and understate the true strength of the floating-rate channel. In contrast, we instrument for firms' debt structures using mutual fund flows, which capture supply-side shocks that are plausibly orthogonal to other components of firms' balance sheets. Our IV estimates indicate that the floating-rate channel is substantially stronger than previously documented with OLS regressions, consistent with the financial accelerator mechanisms (Bernanke and Gertler, 1995; Bernanke et al., 1999; Kiyotaki and Moore, 1997). The evidence shows that rising interest burdens on *existing* floating-rate debt spills over into *new* financing and investment decisions. One particular channel we highlight is the interest coverage constraint emphasized in Greenwald (2019). Firms with large interest expenses relative to their operating earnings cut debt issuance and capital expenditures most sharply when interest rates rise.

2 Background and Data

2.1 Bonds and Loans

Bonds and loans are the two main types of debt used by corporations. A key distinguishing feature is that bonds tend to be fixed-rate, whereas loans tend to be floating-rate (Nini and Smith, 2024). Using data from DealScan and Mergent FISD, we confirm that 98.7% of bonds are fixed rate and 99.4% of loans are floating rate.[2]

Figure 1 shows the composition of aggregate corporate debt outstanding using data from Capital IQ, which confirms that bonds and loans are the two most widely used forms of

[2] There are several institutional reasons for this systematic difference. Banks traditionally have been the largest investors in loans, and they prefer floating-rate debt to match with the floating-rate interest they pay on deposits. By contrast, insurance companies have traditionally been the dominant investors in corporate bonds, and they prefer long-term, fixed-rate debt that better match the long-duration cash flows of life insurance policies and annuities.

corporate debt. The figure also highlights sharp differences across the credit rating spectrum. Investment-grade firms – those with a credit rating of BBB- or better – rely almost entirely on bonds, with other types of debt being quite small. In comparison, speculative-grade firms – those with a credit rating of BB+ or worse – use a mix of bonds and loans, with a ratio of roughly 3:1 in aggregate.[3]

The fact that speculative-grade firms use both fixed-rate bonds and floating-rate loans makes them an ideal setting for identifying the effects of debt structure. For firms that rely almost exclusively on one type of debt – such as investment-grade firms that issue mainly bonds or private firms that borrow primarily through loans – debt structure is essentially collinear with overall leverage. In those cases, differences in outcomes across firms with different amounts of floating-rate debt could simply reflect differences in leverage, which independently influence real and financial decisions (e.g., Ottonello and Winberry, 2020).

Speculative-grade firms, by contrast, display substantial variation in the mix of fixed- and floating-rate debt *holding leverage constant*. This allows us to include granular leverage fixed effects and essentially compare two firms with the same total leverage, one with more fixed-rate bonds and another with more floating-rate loans, thereby credibly attributing differences in outcomes to their interest-rate exposure rather than to capital-structure differences. We view this ability to separate debt *structure* from debt *level* as an important methodological improvement over the existing literature.

Although they represent only a subset of all firms, speculative-grade firms are economically important. Figure A1 shows that they account for about $400 billion in annual capital expenditures and eemploy about 10 million workers, each more than one-third of the total for

[3]These patterns reflect both market access and investor demand. Having a credit rating and registering with the SEC allow speculative-grade firms to easily access the bond market, yet loans remain an important financing source because many major bond investors, such as insurance companies, face mandates or regulatory limits on holding non-investment-grade securities. At the same time, the largest non-bank lenders in the syndicated loan market – mutual funds and collateralized loan obligations – are structured specifically to invest in the debt of speculative-grade borrowers, further supporting loan issuance in this segment of the market.

publicly traded firms. Figure A1 also highlights their importance for *fluctuations* in aggregate activity. During the COVID-19 crisis, for instance, speculative-grade firms' aggregate capital expenditures fell by 29%, compared with only a 6% decline among investment-grade firms. This outsized sensitivity underscores the role speculative-grade firms play in driving movements in real economic variables.

2.2 Bond Funds and Loan Funds

Fixed income mutual funds and ETFs have become one of the largest lenders to corporations. These non-bank intermediaries have clear mandates on the type of debt they are allowed to invest. We focus on those specializing in speculative-grade debt – namely, high-yield fixed income funds – which commonly further differentiate between fixed-rate bonds versus floating-rate loans. For example, the BlackRock High Yield Fund (BHYIX) states in its prospectus that the fund "invests primarily in noninvestment grade bonds with maturities of 10 years or less." Similarly, the Invesco Senior Floating Rate Fund describes itself as a "world-class bank loan fund" that "targets floating-rate, high yield returns by investing in the senior secured debt of large companies."

Figure A2 show that high-yield fixed income mutual funds have experienced tremendous growth, particularly since the 2008 Global Financial Crisis when bank regulations became more stringent (Ma et al., 2022). As of year-end 2024, high-yield bond funds and loan funds managed $396 billion and $127 billion in assets, respectively, which are economically important amounts relative to the $1.6 trillion speculative-grade debt outstanding. These funds supply capital directly to firms in the primary market of corporate bonds (Zhu, 2021) and syndicated loans (Kundu, 2023). In the next section, we show that flows into and out of these funds are a key determinant of firms' financing decisions.

Compared with traditional debt investors such as banks, fixed income mutual funds have several institutional features that make them particularly suited for our analysis. First, funds regularly report detailed security-level holdings, allowing us to identify which funds hold a given firm's debt at any point in time. Second, because funds operate as pass-through vehicles with explicit investment mandates, they translate flows directly into purchases or sales of underlying assets. As we show below, each dollar of inflow or outflow leads bond funds (loan funds) to buy or sell almost exactly one dollar of bonds (loans). Banks, by contrast, invest in a wide range of assets and make discretionary investment choices in response to deposit flows (Supera, 2021).

2.3 Data

Data on mutual funds and ETFs come from CRSP and Morningstar. The data contain total net assets, net flows, and – most importantly – security-level holdings for each fund at a quarterly frequency. We follow Pastor et al. (2015) to merge CRSP with Morningstar and cross-check the two datasets to correct and data errors. We include both mutual funds and ETFs, since they are similar in terms of investor flows and investment strategies. Our sample includes 346 bond funds and 75 loan funds from 2010Q1 to 2024Q4.[4]

We distinguish between bond funds and loan funds using their actual portfolio holdings. For each fund at each period, we compute the share of its corporate debt portfolio invested in bonds versus loans, as reported in the Morningstar holdings data. We classify a fund as a bond fund if the median value of its bond share across all periods exceeds 75%. Likewise, we classify a fund as a loan fund if its median loan share is above 75%. We exclude funds whose portfolios primarily target government bonds, municipal bonds, or mortgage loans, as their investment focus is not on non-financial firms.

Central to our analysis is a measure of firm-specific fund flows in the cross section of firms.

[4] Our sample begins in 2010 because CRSP holdings data are incomplete before 2010 (Schwarz and Potter, 2016).

To build this measure, we need to map the holdings of the funds to the issuing firms. To map bonds to firms, we rely on bond CUSIPs and the Bond-Compustat Link developed in Fang (2025). Loans generally do not have CUSIPs, so we map them to firms using position names and a fuzzy matching algorithm similar to Chave and Roberts (2008).[5]

Accounting data on U.S. non-financial firms come from Compustat. We exclude financial firms (SIC code starting with 6). As discussed previously, we focus on speculative-grade firms since they exhibit meaningful variation in debt structure because they use both fixed-rate bonds and floating-rate loans. We include all firms that ever had a speculative-grade S&P rating during our sample period and retain their full histories, rather than allowing firms to enter and exit the sample as their ratings change. We further restrict the sample to firms that issued at least one bond and at least one loan during the period. Our final sample includes 1,167 firms from 2010Q1 to 2024Q4. Summary statistics of these firms are given in Table 1.

Data on firms' debt structures come from Capital IQ, which compiles information from 10-Ks, 10-Qs, and other SEC filings. For each firm and quarter, the data report the components of outstanding debt along with key characteristics, such as interest-rate type and maturity date. We classify a debt component as floating-rate if it is explicitly labeled as variable-rate or if its remaining maturity is one year or less, since in both cases the interest rate will soon reset to reflect prevailing market rates (Deng and Fang, 2022; Jungherr et al., 2022).

We also use data on new debt issuance. Data on bond issuances come from Mergent FISD, and data on loan issuances come from DealScan.

[5] Specifically, we form a list of *source strings* using position names and a list of *target strings* using Compustat firm names. Each string is partitioned into a bag of words, and we delete words that are unrelated to firm names. For example, we delete dates, instrument types (e.g., FRN or term loan), coupon rates, and punctuation. For each source string, we find the target string that has the highest overlap in number of words.

3 Fund Flows and Debt Structure

This section documents that fixed income mutual fund flows are closely linked to corporate debt structure. When loan funds receive more inflows relative to bond funds, firms tend to issue more loans than bonds, and the composition of their debt shifts toward floating-rate instruments. This relationship is readily visible in the aggregate time series, and we show cross-sectional evidence – using both quantities and prices – to strengthen the causal interpretation.

3.1 Aggregate Evidence

We begin by examining the aggregate time series in Figure 2. The bars show year-over-year net flows to loan funds less net flows to bond funds.[6] Panel A overlays the ratio of newly issued loans relative to newly issued bonds over the same period, using issuance data from DealScan and Mergent FISD. There is a strong positive correlation (0.52) between relative fund flows and corporate issuance choice between loans and bonds. When there are more inflows (outflows) to loan funds or more outflows (inflows) to bond funds, firms are more likely to issue loans than bonds.

In Panel B, the lines plot year-over-year changes in the fraction of *outstanding* debt that comes from loans (green) or any floating-rate debt (red), using quarterly data from Capital IQ. Relative to new issuance, changes in total debt outstanding also capture the impact of debt retirement. When measuring floating-rate debt, we include fixed-rate debt maturing within one year, since the debt will soon mature and be repriced to prevailing interest rates. The two series closely track each other – reflecting the fact that loans are nearly always floating-rate debt – except for during the COVID-19 crisis when firms sharply drew down

[6] Figure A2 shows that loan fund flows and bond fund flows are comparable in magnitude and both are important in driving the dynamics of their difference.

lines of credit, which are predominantly floating-rate (Greenwald et al., 2025). Both series visibly comove with relative fund flows, and the time series correlations are 0.46 and 0.43, respectively. When there are more inflows to loan funds relative to bond funds, firms' *outstanding* debt shifts towards floating-rate loans relative to fixed-rate bonds.

3.2 Firm-Specific Fund Flows

Although the aggregate time series show a strong comovement between fund flows and corporate debt structure, both series could be driven by other macroeconomic factors. In this subsection, we exploit variation in the cross section of firms to bolster the interpretation that relative flows to fixed income funds *lead to* changes in corporate debt structure.

Central to our strategy is a measure of *firm-specific* fund flows that varies *across* firms at a given point in time. This measure is motivated by two stylized facts on the portfolio behavior of fixed income mutual funds. First, funds tend to hold relatively concentrated portfolios. At year-end 2015, for example, there were 729 non-financial speculative-grade firms with at least \$10 million in debt outstanding. The median bond fund, however, held the bonds from only 92 firms, and the median loan fund held loans from only 70 firms.

Second, funds respond to inflows or outflows by nearly proportionally scaling up or down their existing holdings. To confirm this, we run the following regression on a panel of fixed income funds from 2010Q1 to 2024Q4:

$$NetPurchase_{i,t-4,t} = \beta_1 Inflow_{i,t-4,t} + \beta_2 Outflow_{i,t-4,t} + FE + \epsilon_{i,t-4,t} \qquad (1)$$

$NetPurchase_{i,t-4,t}$ denotes fund i's net purchases of corporate debt from quarter-end $t-4$ to t, normalized by lagged corporate debt holdings. We analyze either total net purchases or net purchases of debt by issuers who are already in the fund's portfolio at quarter-end

$t-4$, which we call "portfolio debt". $Inflow_{i,t-4,t}$ and $Outflow_{i,t-4,t}$ denote, respectively, the positive segment and the negative segment of fund i's net flows from quarter-end $t-4$ to t, normalized by lagged fund size. Specifically, $Inflow = \max(0, FundFlow)$ and $Outflow = \max(0, FundFlow)$. We separately examine bonds funds and loan funds and their net purchases of bonds and loans.

Table 2 confirms that fixed income mutual funds near-proportionally scale existing holdings in response to flows. Panel A shows that, for the average bond fund, a 1% inflow leads to an increase in bond holdings of 0.92%, and 82% (0.75 / 0.92) of the net purchases come from portfolio bonds, meaning bonds whose issuers are already held by the fund prior to the flows. Outflows lead to a similar near-proportional scaling down of portfolio bonds. Columns 3 and 4 confirm that bond funds mainly invest in bonds, since their loan holdings are small and relatively unaffected by inflows or outflows.

Panel B shows a similar pattern for loan funds. For the average loan fund, in response to 1% inflow (outflow), its loan holdings increase (decrease) by 0.86% (0.81%), and 76% of the purchases (88% of the sales) come from loans whose issuers are already held by the fund. In contrast, their bond holdings change little in response to flows.

These findings echo those in Zhu (2021) and Barbosa and Ozdagli (2022) and suggest that mutual funds form relationships with firms in their portfolios. There is a cost to producing information about a firm, so portfolio managers optimally under-diversify and hold only a small fraction of the market (van Nieuwerburgh and Veldkamp, 2010). In response to inflows, funds continue to invest in the firms they know best, and in response to outflows, funds mechanically reduce their existing portfolios, since cash holdings are limited and necessary to account for future liquidity needs (Jiang et al., 2021). As a result of this behavior, flows to a fund have an outsized effect on the existing firms in the fund's portfolio.

From a particular firm's perspective, it is exposed to the flows of its *existing* fund investors, and this exposure varies across firms both because the firms are held by different funds and because the funds have different flows. Based on this logic, we create a *firm-specific* credit supply as:

$$Loan|BondFundFlow_{j,t,t+h} = \sum_{i \in L|i \in B} \frac{DebtHeld_{i,j,t} \cdot FundFlow_{i,t,t+h}}{DebtOutstanding_{j,t}} \tag{2}$$

where $i \in L$ and $i \in B$ denote, respectively, the set of loan funds and the set of bond funds, $DebtHeld_{i,j,t}$ is the amount of firm j's debt held by fund i at quarter-end t, $FlowFlow_{i,t,t+h}$ is fund i's net flows from quarter-end t to $t+h$ (normalized by fund size), and $DebtOutstanding_{j,t}$ is firm j's total debt outstanding. Intuitively, this measure captures the amount of buying or selling by the firm's existing loan or bond fund holders if they perfectly proportionally scale up or down their portfolios in response to inflows or outflows. By design, this measure excludes any discretionary trading by fund managers that might reflect firm-specific factors related to the demand for credit.

3.3 Firm-Level Credit Supply and Debt Structure

Armed with the firm-specific measure, we proceed to establish fund flows as an important determinant of debt structure in the *cross section* of firms. We first examine the structure of *new* debt issued, through the following regression estimated on a panel of speculative-grade firms from 2010Q1 to 2024Q4:

$$NewLoanRatio_{j,t-4,t} = \beta_1 LoanFundFlow_{j,t-4,t} + \beta_2 BondFundFlow_{j,t-4,t} + \gamma Controls + FE + \epsilon_{j,t-4,t} \tag{3}$$

The dependent variable is the ratio of loan issuance to the total amount of loans and bonds issued, year over year. By construction, the sample is restricted to firm-quarters with positive debt issuance. $LoanFundFlow$ and $BondFundFlow$ are contemporaneous firm-specific fund flows, defined in Equation 2 of the previous subsection. We control for the firm's log total assets, cash holdings, leverage, profitability, and credit rating (see Appendix C for variable definitions), since these factors may affect debt structure choices. Standard errors are two-way clustered by firm and by quarter.

Table 3 shows the results. Higher loan fund flows are associated with more issuance of loans relative to bonds, and bond fund flows have the opposite effect. The coefficients are remarkably stable across the different specifications. In columns 2 through 5, we include quarter fixed effects to focus on variation across firms at the same time, so the results are unique from the time series evidence we document in Section 3.1. In columns 3 and 4, we interact the quarter fixed effects with the firm's leverage and industry, respectively, to allow for unique time series trends. Based on the results in column 5–which are based on a comparison of firms in the same leverage decile and in the same Fama-French 12 industry in the same quarter–a 1 percentage point increase in loan fund flows (bond fund flows) is associated with a shift towards (away from) loans of 2.966% (1.286% lower). This effect is statistically significant at the 1% level and meaningful relative to the average loan fraction of 45.04%.

We next examine the structure of total debt *outstanding* and show that it also strongly comoves with fund flows in the cross section of firms. We run the following regression on a panel of speculative-grade firms from 2010Q1 to 2024Q4:

$$Loan|FloatingRatio_{j,t} = \beta_1 LoanFundFlow_{j,t-h,t} + \beta_2 BondFundFlow_{j,t-h,t} + \gamma Controls + FE + \epsilon_{j,t} \tag{4}$$

The dependent variable is either the ratio of loans or floating-rate debt (including debt that is maturing within one year) to total debt outstanding. $LoanFundFlow_{j,t-h,t}$ and $BondFundFlow_{j,t-h,t}$ are firm-specific fund flows from Equation 2, where $h = 4$ is the baseline and we show robustness to other horizons. We again control for the firm's log total assets, cash holdings, leverage, profitability, and credit rating. We additionally control for the lag of the dependent variable since capital structure is well-known to be persistent (e.g., Lemmon et al., 2008). We include firm fixed effects to account for time-invariant heterogeneity across firms, and we include leverage decile-by-time fixed effects and Fama-French 12 industry-by-time fixed effects to zoom in on the comparison between firms with near-identical leverage and industry exposure. Standard errors are two-way clustered by firm and by quarter.

Table 4 shows the results. Column 1 of Panel A shows that firms experiencing higher loan fund flows tilt their debt outstanding towards loans, and bond fund flows have the opposite effect. Since both loans outstanding and fund flows are normalized by total debt outstanding, the coefficients can be interpreted as the pass-through of fund flows to debt outstanding. Specifically, 1 dollar of inflows to loan funds (bond funds) is associated with \$0.642 higher (\$0.570 lower) loans outstanding. The coefficient estimates are statistically significant at the 1% level and suggest a high degree of pass-through from fund flows to debt outstanding. Since almost all loans are floating rate and almost all bonds are fixed rate, column 2 of Panel A shows very similar relationship between fund flows and the floating-rate ratio.[7]

Panel B of Table 4 examines how the relationship between fund flows and debt structure varies across different horizons. We estimate Equation 2 using different values of h ranging from 4 quarters (one year) to 16 quarters (four years) and find that fund flows have a statistically significant impact on debt structure at every horizon. The magnitudes are broadly similar, but the effects are strongest at the two-year horizon, which we find intuitive. Because firms issue debt relatively infrequently, it takes time for a supply shock to fully materialize. At longer horizons, however, the effect becomes harder to detect as other forces accumulate and introduce noise into the inference.

[7] We note that the coefficients on the lagged dependent variables are highly statistically significant and not absorbed by the firm fixed effect, confirming that debt structure is persistent.

We estimate a piecewise version of Regression 4 to allow the relationship between fund flows and debt structure to be non-linear. Specifically, in each period, we sort fund flows into terciles and examine the relationship with debt structure separately for each tercile. Table A1 in the Appendix shows that the comovement between fund flows and debt structure is concentrated in the bottom and the top terciles of fund flows. The results suggest that debt structure responds predominately to large fund flows, whereas small fund flows are not sufficient to encourage firms to deviate from their otherwise optimal choice.

3.4 Why Do Firms "Go with the Flow"?

Our interpretation of the evidence in Section 3.3 is that fund flows change the relative cost of floating-rate loans versus fixed-rate bonds, and firms optimally cater to fund flows to save borrowing costs (Baker and Wurgler, 2002). We find consistent evidence from the pricing of loans and bonds at issuance. Specifically, we run the following regression on a sample of newly-issued loans and a sample of newly-issued bonds:

$$OfferingSpread_{d,j} = LoanFundFlow_{j,t-4,t} + BondFundFlow_{j,t-4,t} + \gamma Controls + FE + \epsilon_{d,j} \tag{5}$$

The dependent variable is the interest-rate spread for debt d issued by firm j. We measure the spread for loans as the contractual spread relative to LIBOR or SOFR and the spread for bonds as the difference between the offering yield and a duration-matched Treasury yield. $LoanFundFlow_j$ and $BondFundFlow_j$ are, respectively, firm-specific fund flows to issuer j from Equation 2 defined over the four quarters immediately before the issuance date of the loan or bond. $Controls$ include loan or bond characteristics (years to maturity, log issuance amount) and issuer characteristics (log total assets, cash holdings, leverage, profitability). FE includes firm fixed effects, rating letter-by-quarter fixed effects, and industry-by-quarter fixed effects.

Table 5 shows the results. Column 1 shows that, within the sample of loan issuances, issuers that have recently experienced larger loan fund inflows issue loans at significantly lower spreads. Similarly, Column 2 shows that, within the sample of bond issuances, issuers facing larger bond fund inflows issue bonds at lower spreads. Notably, loan-fund flows do not significantly affect bond offering spreads, and bond-fund flows do not affect loan offering spreads. These results point to substantial segmentation between the loan and bond markets, where capital flows in one market do not spill over to the other, creating wedges in relative financing costs.[8]

The pricing results provide evidence against the interpretation that the results in Section 3.3 reflect the endogenous response of fund flows to firms' demand for a particular debt structure. Under this demand-driven view, an increase in firms' relative demand for loans (as opposed to bonds) incentivizes loan fund managers (and disincentives bond fund managers) to acquire more flows to meet the increase in demand, which would lead to an *increase* in loan spreads. Instead, we find that loan fund inflows are associated with greater loan borrowing and, simultaneously, lower loan spreads. This combination of larger borrowing quantities and lower borrowing costs is consistent with shifts in credit supply rather than changes in firm demand.

This result is not surprising since the firm-specific fund flow measure is constructed to capture credit supply and be orthogonal to firm demand. To see why, note that our measure closely resembles a Bartik-style shift-share instrument (Goldsmith-Pinkham et al., 2020). In the canonical setting, local labor markets are differentially exposed to national industries through predetermined employment shares, and industries experience imperfectly correlated labor-supply shocks. Because each industry is present in many counties, the industry-level shocks are plausibly exogenous to conditions in any single county, and variation in local outcomes arises from differences in counties' exposure to common industry-wide supply shocks, rather

[8]The results are consistent with the secondary market price effects documented in Chaudhary et al. (2022) and Emin et al. (2023).

than from local labor demand feeding back into industry-level conditions. Similarly, in our setting, firms are differentially exposed to funds through predetermined portfolio weights, and those funds experience imperfectly correlated flows. Since the typical fund holds nearly 100 firms, it is unlikely that the financing decisions of any one firm can meaningfully influence fund-level flows. Instead, the firm-specific fund flow measure captures firms' heterogeneous exposure to common, fund-level supply shocks.

4 Flow-induced Debt Structure and Monetary Policy Transmission

The previous section shows that companies rationally "go with the flow" to save on cost of capital. This section shows that the cost of capital savings are not a free lunch: they expose firms to future interest rate risk. Using fund flows as instruments, we then quantify the causal effect of debt structure on firm sensitivity to interest rates, which suggests a much larger role for the floating-rate channel of monetary policy compared to existing estimates. According to our IV estimates, debt structure is responsible for nearly \$1 trillion of capital expenditures during the 2022-23 rate hike cycle, 10 times the size implied by OLS estimates.

We begin by examining the link between past fund flows and future interest rate sensitivity through the following regression:

$$CapEx_{j,t,t+4} = \beta \Delta FFR_{t,t+1} \times FundFlow_{j,t-8,t} + \gamma Controls + FE + \epsilon_{j,t,t+4} \quad (6)$$

$CapEx$ denotes capital expenditures, the main outcome variable in benchmark studies (e.g., Ippolito et al., 2018) and a central object of monetary policy transmission. ΔFFR denotes changes in the federal funds rate. Note that rate changes are measured from quarter-end t to $t+1$, while capital expenditures are measured from quarter-end t to $t+4$ in order to capture delayed firm responses. $FundFlow$ includes firm-specific loan and bond fund flows (Equation 2) *prior to* the rate changes. The coefficient β shows whether firms with different lagged fund flows are differentially sensitive to subsequent interest rate changes. $Controls$ include log total assets, cash ratio, leverage, profitability and credit rating (see Appendix C for variable definitions). FE includes firm fixed effects, leverage decile by quarter fixed effects, and Fama-French 12 industry by quarter fixed effects.

Column 1 of Table 6 shows the results. The coefficients on the interaction terms are statistically significant and have opposite signs. In response to a 1 p.p. increase in federal funds rate, firms with 1 p.p. higher prior loan fund flows have *lower* capital expenditures equal to 0.101% of total assets, whereas firms with 1 p.p. higher prior bond fund flows have *higher* capital expenditures equal to 0.088% of total assets. The opposing effects of loan fund flows and bond fund flows suggest that the underlying mechanism is not the credit supply itself but rather operates through the change in debt structure it induces. Loan-fund flows raise firms' exposure to floating-rate debt, while bond-fund flows reduce it, leading to different responses to interest-rate changes.[9] In the subsection below, we provide a structural interpretation of the regression coefficients.

In principle, firms could cater to fund flows and simultaneously hedge the resulting interest rate exposure through derivatives. In practice, however, hedging can be costly, particularly for the speculative-grade firms we study, which often limited collateral (Rampini and Viswanathan, 2010). These firms typically rely on over-the-counter swaps rather than centrally cleared instruments, and prior work shows that such swaps carry large premia due to regulatory frictions, especially for low credit quality firms (Cenedese et al., 2020). Consistent with these constraints, our results indicate that flow-induced debt structure changes are not

[9] Bonds and loans also differ in terms of monitoring intensity and collateral usage, which could in principle amplify firms' sensitivity to interest rate changes. However, it is challenging to construct a mechanism based on these features that would generate a negative interaction with loan fund flows and a positive interaction with bond fund flows. The pattern instead points to differences in interest rate structure the most likely mechanism.

hedged away through derivatives.

4.1 Revisiting the Floating-Rate Channel of Monetary Policy

The strong link between fund flows and debt structure presents a new avenue to revisit the floating-rate channel of monetary policy (e.g. Ippolito et al., 2018). Existing studies typically estimate this channel using observed debt structures, which are endogenously chosen by firms. A large theoretical and empirical literature shows that firms actively tailor their debt structures to manage exposure to aggregate shocks (e.g., Chen et al., 2021). In our context, firms may choose a higher share of floating-rate debt to *offset* the interest rate sensitivity arising from other parts of their balance sheets. For example, if firm A has a higher floating-rate ratio than firm B, the difference may reflect that firm A's operating cash flows are more sensitive to macroeconomic conditions, such as output prices that comove more strongly with inflation and interest rates. Through optimal matching of liabilities and assets, firm A may therefore be no more exposed to interest rates changes than firm B. As a result, the coefficient on the interaction term in an OLS regression would be biased toward zero. Figure A3 illustrates this endogeneity across industries. In more pro-cyclical industries with operating cash flows that are positively correlated with the federal funds rate, such as consumer durables, firms use more floating-rate debt. Conversely, firms in less cyclical industries, such as utilities, rely much less on floating-rate debt. This pattern underscores the endogenous nature of debt structure choices and highlights the difficulty of isolating the effect of debt structure from other aspects of firms' operations.

We argue that fund flows provide a plausibly exogenous shifter of corporate debt structure that can be used to identify the floating-rate channel of monetary policy. Section 3.3 shows that higher loan fund flows or lower bond fund flows are associated with large shifts toward floating-rate loans relative to fixed-rate bonds. Section 3.4 shows that firms implement these shifts to lower borrowing costs. As a result, these flow-induced changes are driven by cost of capital considerations and are plausibly orthogonal to other parts of firms' balance sheets.

Formally, we instrument for firms' debt structures using firm-specific fund flows defined in Equation 2. As discussed in Section 3.4, our measure can be viewed as a shift-share instrument, where the shift is fund flows, and the share is lagged ownership. Intuitively, the measure captures the change in a firm's credit supply if each of its existing fund investors proportionally scales up or down their holdings with inflows or outflows, excluding all discretionary trading by the fund managers. Either the shift or the share of the shift-share instrument needs to be exogenous (Goldsmith-Pinkham et al., 2020). In our setting, lagged ownership – the share – is plausibly exogenous. It is unlikely that a relationship between a firm and a fund is driven by future changes in the firm' debt structure. Section 3.4 also provided additional evidence against reverse-causality.

Armed with the instrument, we revisit the regression that examine the link between debt structure and firm sensitivity to interest rates (e.g., Ippolito et al., 2018):

$$CapEx_{j,t,t+4} = \beta \Delta FFR_{t,t+1} \times FloatingRatio_{j,t} + \gamma Controls + FE + \epsilon_{j,t} \tag{7}$$

$CapEx$ denotes capital expenditures. ΔFFR denotes changes in the federal funds rate. $FloatingRatio_{j,t}$ denotes floating-rate ratio, defined as the ratio of total debt that is floating-rate or maturing within one year.[10] β shows whether firms with different floating-rate ratios exhibit differential sensitivity to interest rate changes. $Controls$ include log total assets, cash ratio, leverage, profitability and credit rating (see Appendix C for variable definitions). FE includes firm fixed effects, leverage decile by quarter fixed effects, and Fama-French 12 industry by quarter fixed effects. Standard errors are two-way clustered by firm and by quarter.

[10]Floating-rate ratio is de-meaned, so its coefficient can be interpreted as relative to the average firm in the sample.

Column 2 of Table 6 shows the regression results estimated using ordinary least squares (OLS). The coefficient suggests that, in response to 1-percentage-point increase in federal funds rate, firms with 1-percentage-point higher floating-rate ratio are associated with lower capital expenditures equal to 0.009% of total assets. In other words, a firm with 100% floating-rate debt would decrease its capital expenditures by 0.9% of total assets more than a firm with 100% fixed-rate debt. The estimates are similar in magnitude but slightly smaller than existing studies. For example, Ippolito et al. (2018) finds that, for a sample of constrained firms, in response to 1 p.p. rate increase, switching from 100% fixed-rate debt to 100% floating-rate debt leads to lower investment equal to 3.45% of property, plant, and equipment, which is roughly 1% of total assets for the average firm.[11]

Column 3 of Table 6 shows the regression results estimated using two-stage least squares (2SLS), where we instrument for $FloatingRatio_{j,t}$ and its interaction with rate changes using $LoanFundFlow_{j,t-8,t}$, $BondFundFlow_{j,t-8,t}$ and their interactions with rate changes in the first stage. Since our instruments capture *changes* in debt structure, we additionally control for the lagged floating-rate ratio and its interaction with rate changes. The first-stage Cragg-Donald F-statistic is 48.693, much higher than the 5% critical value of 11.04 according to Stock and Yogo (2005).[12] The strong first-stage relevance of these instruments should not come as a surprise given our analyses in Section 3.3.

The regression coefficient in Column 3 implies that, in response to 1-percentage-point increase in the federal funds rate, firms with 1-percentage-point higher floating-rate ratio are associated with lower capital expenditures equal to 0.118% of total assets. In other words, a firm with 100% floating-rate debt would decrease its capital expenditures by 11.8% of total

[11] The remaining differences are due to three reasons. First, we focus on a different sample period, which suggests that the effect of raw observed debt structure on monetary policy transmission has declined over time. Second, we include leverage decile by quarter fixed effects, which allow us to better isolate the effect of debt *structure* and distinguish it from the effect of *leverage*, which independently affects firm sensitivity to interest rates (Ottonello and Winberry, 2020). Lastly, we adopt two-way clustered standard errors, which are more conservative.

[12] We refer to Table 1 Column 5 of Stock and Yogo (2005), which shows the 5% critical value for two endogenous variables and four exogenous instruments.

assets more than a firm with 100% fixed-rate debt. Therefore, the IV estimate is an order of magnitude larger than the OLS estimate. This is consistent with the interpretation that raw observed floating-rate ratios are endogenous and subject to selection bias. Firms with higher floating-rate ratios may have chosen their debt structure to *offset* the interest rate sensitivity in other parts of their balance sheets, and the OLS estimate can be biased towards zero as a result. By using supply-side shocks coming from fixed income mutual fund flows, we capture the component of debt structure that is plausibly orthogonal to other parts of the firm's balance sheets and constitutes real interest rate exposure.

In Table A2, we further decompose rate changes into a positive component and a negative component, representing monetary tightening and easing, respectively. The results show that effects are larger for tightening and smaller for easing. This is consistent with the presence of callable bonds. For monetary tightening, callable bonds shield borrowers from rate increases, same as non-callable bonds. For monetary easing, however, callable bonds – those without the make-whole provision – offer borrowers the option to prepay their debt at par, effectively repricing the interest rates similar to a floating-rate loan.[13]

4.2 Understanding the Magnitude

How should we understand the large magnitude of the effect of debt structure on investment sensitivity to interest rate? When rates increase, where does the fall in capital expenditures come from? To answer these questions, we investigate other cash flow variables, including interest expenses, net debt issuance, net equity issuance, change in cash holdings, and operating income. Specifically, we re-run Regression 7 with different cash flow variables as the

[13] Ideally, we want to modify our measure of floating-rate ratio to include callable bonds for monetary easing. However, Capital IQ does not contain information on callability, and bond-level databases such as Mergent FISD do not capture the universe of bonds, such as foreign bonds and non-144A private placement bonds. More importantly, for our sample of speculative-grade firms, the typical call option is a complex hybrid, initially make-whole callable and later callable with fixed strikes, which reset periodically towards maturity (Ma et al., 2023). Therefore, the exact moneyness of a call option changes significantly over time, which makes it important but difficult to measure.

dependent variable, using 2SLS with lagged fund flows as instruments.

The results are shown in Table 7. Column 1 shows that there is a significant effect on interest expenses. In response to 1 p.p. increase in federal funds rate, firms with 100% floating-rate debt incur higher interest expenses equal to 0.7% of total assets than firms with 100% fixed-rate debt. The results are very intuitive. However, the magnitude on interest expenses is too small to explain that on capital expenditures.

Column 2 shows that there is a large effect on net debt issuance. In response to 1 p.p. increase in rate, firms with 100% floating-rate debt reduce net debt issuance by 9.7% of total assets than firms with 100% fixed-rate debt. Not only do high-floating-ratio firms incur more interest expenses on *existing* debt, they also reduce issuances of *new* debt, where the magnitude can almost exactly explain the reduction of capital expenditures. The results are consistent with the financial accelerator channels (e.g., Bernanke et al., 1999): increases in interest rates weaken firms' balance sheet and make it harder for them to raise new capital, amplifying the direct effect of rate increases. Our results here present one of the first studies that empirically anatomize the interaction between existing old debt and the issuance of new debt.

One of the financial accelerator channels that is particularly relevant for our sample of speculative-grade firms is the interest coverage constraint (Greenwald, 2019). Credit agreements typically contain covenants that require firms to maintain some minimum level of interest coverage, defined as:

$$InterestCoverage = \frac{EBIDTA^{\$}}{DebtAmount^{\$} \times InterestRate^{\%}}$$

Table 1 shows the summary statistics of interest coverage for our sample of speculative-grade firms, where we use operating income as a proxy for EBITDA. The median interest coverage is 4.50, and roughly one-third of firm-quarter observations have coverage below

2.75, which is in the range of threshold commonly specified in debt contracts. For these firms, a sharp increase in the reference interest rate would substantially raise the risk of a covenant violation. For instance, for a firm with a spread of 4%, a rise in the reference rate from 0.5%[14] to 5% would *double* the total interest rate from 4.5% to 9%, halving the firm's interest coverage without any offsetting adjustment. To maintain constant interest coverage, the firm would need to reduce its outstanding debt outstanding by *one-half*.

Table 8 shows evidence to support the impact of interest coverage. Each period, we sort firms into high, medium, or low interest coverage and separately run 2SLS Regression 7 for each tercile of firms. The results show that the effect of debt structure on interest rate sensitivity is concentrated in firms with the lowest interest coverage. In response to 1 p.p. increase in rate among those in the lowest tercile of interest coverage, firms with 100% floating-rate debt cut capital expenditures by 19.9% of total assets, compared to firms with 100% fixed-rate debt. The effect of debt structure becomes much weaker for firms with high interest coverage.

4.3 Evidence from Stock Returns around FOMC Announcements

In this subsection, we present corroborating evidence using stock returns around FOMC announcements. This high-frequency event study approach helps mitigate the endogeneity concerns in quarterly changes in the federal funds rate, which could reflect inflation or other macroeconomic shocks that could be the true driver of the firm investment behavior that we document. Although our analysis is about firm sensitivity to interest rate changes – whether or not they are fully predicted by other macroeconomic variables – examining pure interest rate shocks helps pinpoint the underlying mechanism. During the narrow windows around FOMC announcements, there is unlikely any shocks other than changes in interest rates, so change in stock prices can be more confidently attributed solely to interest rate changes.

[14] Many loans have a floor on the reference rate, and 0.5% is quite common.

The hypothesis is that, during the two-day windows around FOMC announcements, firms with higher floating-rate ratios due to prior fund flows have higher sensitivity of their stock returns to changes in interest rates. As elaborated in Ippolito et al. (2018) and Gurkaynak et al. (2022), stock investors are sophisticated and pay close attention to firms' floating-rate debt exposure, so when the Federal Reserve announces unexpected changes in interest rates, there will be immediate changes in stock prices to reflect the updated expectations of their future interest expenses and financing costs associated with floating-rate debt exposure.

We focus on the 111 pre-scheduled FOMC announcements from 2010 to 2023, the same window as our previous low-frequency analysis. We use the monetary policy surprises (MPS) developed by Bauer and Swanson (2023).[15] This measure is the first principal component of changes in interest rates for Eurodollar futures in a 30-minute window around the FOMC announcement, normalized so that 1 unit change in MPS corresponds to 1 p.p. change in the one-year Treasury rate. Following Ippolito et al. (2018) and Gurkaynak et al. (2022), we use stock returns from the end of the day before the announcement to the end of the day after the announcement, which allows market participants sufficient time to process and trade based on the news. All firm variables, including the floating-rate ratio, are measured as of the quarter immediately prior to each announcement.

We run the following regression on the panel of U.S. speculative-grade firms (indexed by j) over FOMC announcements (indexed by τ) from 2010 to 2023:

$$Return_{j,\tau} = \beta MPS_{\tau} \times FloatingRatio_{j,\tau-1} + \gamma Controls + \epsilon_{j,\tau} \tag{8}$$

where $Return$ denotes the two-day return around each announcement, MPS denotes monetary policy surprises (normalized to be in the same unit as one-year Treasury rate in percentage point), and $FloatingRatio$ denotes the floating-rate ratio, defined as ratio of total debt that is floating-rate or maturing within one year. $Controls$ include log total assets,

[15] We find similar results using Gurkaynak et al. (2005) path shocks. See Table A3.

cash ratio, leverage, profitability and credit rating (see Appendix C for variable definitions). FE includes firm fixed effects, leverage decile by FOMC fixed effects, and Fama-French 12 industry by FOMC fixed effects.

Table 9 shows the results. Column 1 shows that, in response to 1 p.p. rate increase, there is on average 15.789 p.p. decline in stock returns for our sample of speculative-grade firms. Column 2 shows that, in response to rate increase, firms with higher prior loan fund flows or lower prior bond fund flows experience larger declines in stock returns. In response to fund flows, these firms optimally increase the ratio of floating-rate debt, which exposes them to subsequent interest rate hikes.

Column 3 examines how stock return sensitivity varies with raw observed floating-rate ratios, similar to Ippolito et al. (2018) and Gurkaynak et al. (2022). For our sample of speculative-grade firms from 2010 to 2023, firms with higher floating-rate ratios actually experience slightly higher FOMC returns in response to interest rate hikes. The discrepancy with Ippolito et al. (2018) and Gurkaynak et al. (2022) is due to three reasons. First, we focus on a different sample period, which suggests that the effect of raw observed debt structure on stock return sensitivity to monetary policy has diminished over time. Second, we include leverage decile by quarter fixed effects, which allow us to better isolate the effect of debt *structure* and distinguish it from the effect of *leverage*, which independently affects firm sensitivity to interest rates (Ottonello and Winberry, 2020). Lastly, we adopt two-way clustered standard errors, which are more conservative.

To address the endogeneity concerns and identify the causal effect of floating-rate debt on interest rate sensitivity, we instrument floating-rate ratios with loan fund flows and bond fund flows over the previous eight quarters. The results are shown in Column 4. The Cragg-Donald F-statistic is 35.672, well above the 5% critical value of 11.04 according to Stock and Yogo (2005). The coefficient shows that, in response to +1 p.p. MPS, firms with 1 p.p. higher floating-rate ratio experience significantly lower stock returns equal to 0.297 p.p. The results here, together with the quarterly real investment analyses in the previous section, highlight the potential endogeneity of floating-rate ratios, and suggest that, with proper instruments, the floating-rate channel of monetary policy is much stronger than what conventional OLS estimates suggest.

4.4 Aggregate Effects

Using our IV estimates above, we conduct a simple counterfactual analysis to quantify the aggregate effect of debt structure during the recent interest rate hike. From year-end 2021 to 2023, the Fed raised the federal funds rate from near zero to over 5 percentage points, leading to one of the most aggressive interest rate hikes in history. As we have demonstrated above, this rate hike should particularly affect firms with floating-rate debt, directly due to higher interest expenses and indirectly due to the financial accelerator channels.

To quantify the effect of debt structure, we ask: if all of the floating-rate corporate debt were switched to fixed rate prior to the rate hike, how much would aggregate capital expenditures have changed during the rate hike? This is given by the following formula:

$$\sum_j -\beta \times 5 \times FloatingRatio_{j,2021Q4} \times TotalAssets_{j,2021Q4}/100 \tag{9}$$

Essentially, we do a back-of-envelop calculation of the change in capital expenditures for each firm j, and sum up these changes across all firms. β comes from 2SLS Regression 7, which gives the change in investment (relative to total assets) per unit of rate change and per unit of floating-rate ratio. 5 refers to the total change in federal funds rate from year-end 2021 to 2023. $FloatingRatio$ and $TotalAssets$ denote, respectively, the ratio of floating-rate debt and total assets as of year-end 2021.

This calculation is straightforward for publicly traded companies. For private companies, we assume that their debt switch from 100% floating rate to 100% fixed rate, as these companies should be bank-reliant and bank loans are typically floating rate. To derive the size of their total assets, we use information from B.103 Balance Sheet of Nonfinancial Corporate Business and calculate the difference between the entire sector ($57 trillion) and the sum of public companies from Compustat ($25 trillion), which is $32 trillion.

As we have shown in Panel A of Table 8, the effect of floating-rate ratio on investment sensitivity is heterogeneous effect across firms. That is, β should vary across firms depending on the interest coverage. However, private firms' interest coverage is difficult to obtain. As an alternative, we conduct a similar analysis with leverage as the sorting variable, which correlates with interest coverage. Panel B of 8 shows that β is -0.145 for firms in the highest leverage tercile, -0.046 for firms in the middle leverage tercile, and -0.013 for firms in the lowest leverage tercile. For our quantification, we map each company j to one of the three leverage terciles, and use the corresponding β for calculation. Private firms' total debt is calculated as the difference between B.103 ($13 trillion) and the sum of public companies ($9 trillion), which is $4 trillion. Therefore, the average leverage of private firms is 13%, which belongs to the lowest leverage tercile.

According to our calculation, total capital expenditures would have increased by $0.94 trillion – or 17% of the actual $5.5 trillion capital expenditures – if all corporate debt were fixed rate. $0.21 trillion comes from investment-grade public firms. Although investment-grade firms have $25 trillion total assets, most of their debt is fixed-rate bonds, so the switch in debt structure does not affect many of them. $0.56 trillion comes from speculative-grade or unrated public firms, a lot of which have significant amount of floating-rate debt. A switch to fixed-rate debt significantly reduce the effect of interest rate hikes on these firms' interest expenses and balance sheets. $0.17 trillion comes from private firms. These firms have $32 trillion total assets and we assume that they switch from 100% floating rate to fixed rate. However, private firms have low leverage, so the combined effect with a small β is modest.

In contrast to the \$1 trillion calculation based on the IV estimates, this number would have been substantially lower, at \$0.09 trillion, if we were to apply the OLS estimates instead of the IV estimates. Assuming that our IV estimates are correctly identified, our results imply that the debt structure channel is of first-order importance for the pass-through of monetary policy to aggregate real activities.

5 Conclusion

The structure of firms' existing debt has an important effect on their exposure to future changes in monetary policy rates. In this paper, we exploit the recent rise of fixed income mutual funds and the detailed data they report to show that their supply of capital is an important determinant of firms' debt structures. Using fund flows to provide exogenous variation in debt structure, we revisit the debt structure channel of monetary policy and estimate considerably larger sensitivities than existing studies.

From a policy perspective, our results show that not all floating-rate debt is created equal. Some portion of floating-rate exposure is chosen endogenously by firms to limit their sensitivity to interest-rate changes. Other components – such as those driven by mutual-fund flows or other credit-supply shocks – reflect deviations from firms' natural debt structures that lower the cost of capital at the expense of greater interest-rate risk. Indeed, Figure 2 shows that, prior to the 2022–23 tightening cycle, the aggregate floating-rate share declined sharply, coinciding with a drop in loan-fund flows relative to bond-fund flows. This flow-induced decrease in floating-rate debt likely represents a genuine reduction in interest-rate exposure, and its effects are therefore best evaluated using our IV estimates. For the effective implementation of monetary policy, it is important to understand the sources of debt structure and to distinguish components that amplify firms' sensitivity to interest rates – such as those driven by mutual-fund flows – from those that do not.

Our results also suggest a new form of path dependency in the transmission of monetary policy. Studies by Fang (2025) and Cetorelli et al. (2025) show that monetary policy affects flows into bond funds and loan funds in opposite directions. We show that differential flows, in turn, reshape firms' debt structures and alter the sensitivity of the corporate sector to subsequent policy actions. Policy tightening today can lead to higher loan fund flows relative to bond fund flows, leading firms to rely more heavily on floating-rate debt and thereby increasing their exposure to *future* changes in interest rates. Conversely, policy easing today reduces firms' sensitivity to future monetary policy. These dynamics suggest that the trajectory of fund flows is an important state variable that policymakers should consider when assessing the effectiveness of monetary policy.

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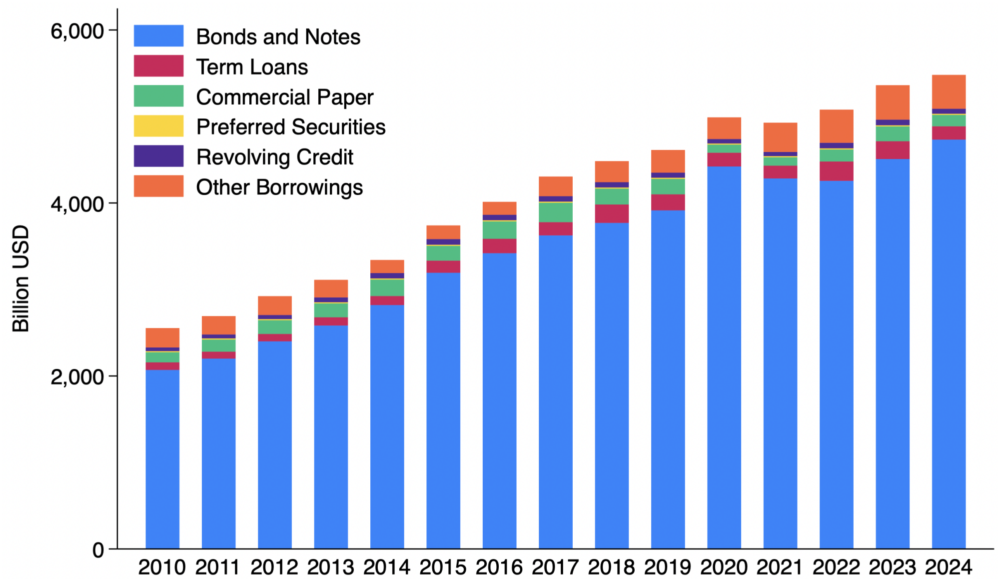
Figures

Figure 1: **Aggregate Corporate Debt Structure.** These figures plot the composition of debt outstanding for publicly traded U.S. non-financial firms, separately for those with investment-grade ratings (Panel A) and speculative-grade ratings (Panel B).

Investment-Grade Firms



Speculative-Grade Firms

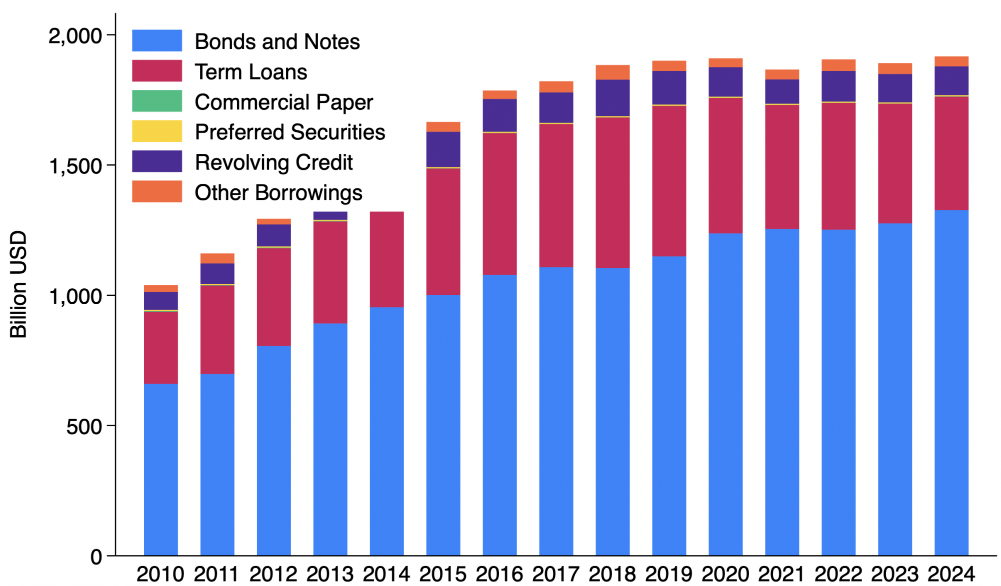
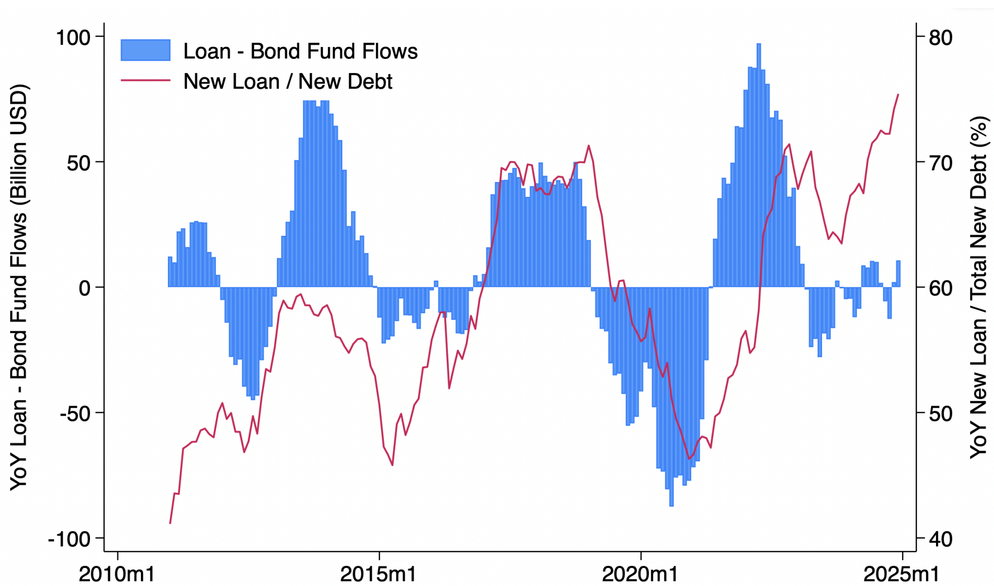
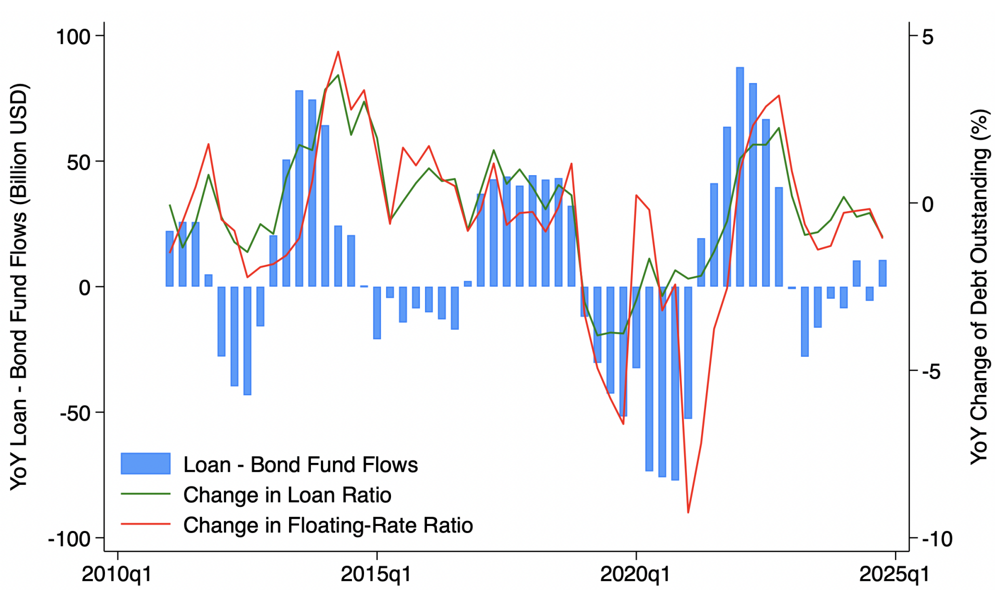


Figure 2: **Fixed Income Mutual Fund Flows and Corporate Debt Structure, Aggregate Time Series.** These figures show the comovement between fixed income mutual fund flows and the debt structure of U.S. speculative-grade non-financial firms in aggregate time series. The blue bars show year-over-year net flows to loan mutual funds relative to bond mutual funds. In Panel A, the red line shows the ratio of new loans to total new debt issued by firms, year over year. In Panel B, the red (green) line shows year-over-year changes in the ratio of loans (floating-rate debt) outstanding relative to firms' total debt outstanding.

Panel A: New Debt Issuance



Panel B: Total Debt Outstanding



Tables

Table 1: **Summary Statistics.** This table shows summary statistics of the main variables in our analysis. $LoanFundFlow/TotalDebt$ ($BondFundFlow/TotalDebt$) is weighted sum of net flows to a firm's existing loan fund investors (bond fund investors), according to Equation 2. $NewLoan/NewDebt$ is ratio of new loans to total new debt issued, year over year. $LoanDebt/TotalDebt$ is amount of loan debt relative to total debt outstanding. $FloatingDebt/TotalDebt$ is amount of floating-rate debt or debt maturing within one year relative to total debt outstanding. Definitions of the remaining control variables are given in Appendix C. The sample includes 1,167 non-financial speculative-grade firms from 2010Q1 to 2024Q4.

	N	Mean	SD	P10	P50	P90
1Y Loan Fund Flow / Total Debt (%)	36385	0.01	1.07	-0.41	0.00	0.25
2Y Loan Fund Flow / Total Debt (%)	33967	-0.01	1.50	-0.65	0.00	0.43
1Y Bond Fund Flow / Total Debt (%)	36385	-0.11	1.28	-1.32	0.00	0.91
2Y Bond Fund Flow / Total Debt (%)	33967	-0.34	1.91	-2.39	0.00	1.26
New Loan / New Debt (%)	18090	45.04	45.27	0.00	34.46	100.00
Loan Debt / Total Debt (%)	36425	27.37	31.80	0.00	14.44	80.47
1Y Change	32377	-0.36	13.79	-11.47	0.00	9.36
2Y Change	28480	-0.81	19.45	-20.25	0.00	17.30
Floating Debt / Total Debt (%)	36425	36.10	31.71	0.00	29.41	90.96
1Y Change	32377	-0.55	17.41	-18.05	0.00	16.27
2Y Change	28480	-1.04	23.23	-26.43	0.00	23.11
1Y Capital Expenditure / TA (%)	34656	5.59	6.83	0.83	3.42	12.46
1Y Interest Expense / TA (%)	34656	2.85	1.99	0.89	2.35	5.50
1Y Net Debt Issuance / TA (%)	34656	2.59	11.24	-6.05	0.00	13.72
1Y Net Equity Issuance / TA (%)	34656	-1.75	5.34	-7.17	-0.68	0.41
Total Assets (bn $)	38752	10.62	24.97	0.92	3.83	21.69
Cash Ratio (%)	38752	9.02	8.94	0.83	6.30	20.84
Leverage (%)	38752	45.05	21.90	19.76	42.10	73.45
Profitability (%)	38373	11.72	9.25	3.42	11.03	21.94
Credit Rating (AAA = 1, CCC- = 19)	38758	12.93	2.26	10.00	13.00	16.00
Interest Coverage	37513	7.07	10.04	1.05	4.50	15.18

Table 2: **Portfolio Scaling by Fixed Income Mutual Funds.** These tables examine how fixed income mutual funds scale their existing portfolios in response to flows on a year-over-year basis, according to Regression 1:

$$NetPurchase_{i,t-4,t} = \beta_1 Inflow_{i,t-4,t} + \beta_2 Outflow_{i,t-4,t} + FE + \epsilon_{i,t-4,t}$$

$NetPurchase_{i,t-4,t}$ denotes fund i's year-over-year net purchases of all bonds, portfolio bonds (bonds issued by firms with positive holdings as of quarter-end $t-4$), all loans, or portfolio loans (bonds issued by firms with positive holdings as of quarter-end $t-4$), normalized by total corporate debt holdings. $Inflow$ and $Outflow$ denote, respectively, the positive segment and the negative segment of year-over-year net flows to fund i (normalized by fund size), i.e. $\max(0, Flow)$ and $\min(0, Flow)$. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Panel A: Bond Funds

Dependent Variable	Net Purchase (% of Total Corporate Debt Holding)			
	All Bonds (1)	Portfolio Bonds (2)	All Loans (3)	Portfolio Loans (4)
Fund Inflow (%)	0.92*** (17.88)	0.75*** (17.43)	0.02*** (2.96)	0.01*** (2.98)
Fund Outflow (%)	0.89*** (17.93)	0.75*** (15.68)	0.03*** (3.93)	0.02** (2.51)
Fund FE	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y
Standard Errors	Clustered by Fund and by Quarter			
Observations	8637	8637	8637	8637
R2	0.81	0.75	0.19	0.53

Panel B: Loan Funds

Dependent Variable	Net Purchase (% of Total Corporate Debt Holding)			
	All Bonds (1)	Portfolio Bonds (2)	All Loans (3)	Portfolio Loans (4)
Fund Inflow (%)	0.15*** (3.04)	0.04* (1.81)	0.86*** (12.55)	0.65*** (9.72)
Fund Outflow (%)	0.13*** (3.86)	0.07*** (3.73)	0.81*** (6.93)	0.71*** (9.24)
Fund FE	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y
Standard Errors	Clustered by Fund and by Quarter			
Observations	2493	2493	2493	2493
R2	0.36	0.42	0.82	0.65

Table 3: **Firm-Specific Fund Flows and Structure of New Debt Issued.** This table examines how loan fund flows and bond fund flows affect the structure of new debt issued in the cross section of firms, according to Regression 3:

$$NewLoanRatio_{j,t-4,t} = \beta_1 LoanFundFlow_{j,t-4,t} + \beta_2 BondFundFlow_{j,t-4,t} + \gamma Controls + FE + \epsilon_{j,t-4,t}$$

The dependent variable is the share of new loans in total new debt issued, year over year. $LoanFundFlow$ and $BondFundFlow$ measure firm-specific fund flows according to Equation 2). t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable	New Loan / Total New Debt (%)				
	(1)	(2)	(3)	(4)	(5)
Loan Fund Flow (%)	3.023***	3.326***	3.033***	3.347***	2.966***
	(4.974)	(4.704)	(4.499)	(4.976)	(4.010)
Bond Fund Flow (%)	-2.221***	-1.863***	-1.864***	-1.337***	-1.286***
	(-3.850)	(-3.553)	(-3.739)	(-3.260)	(-3.021)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating				
Firm FE	Y	Y	Y	Y	Y
Quarter FE		Y			
Quarter FE × Leverage Decile FE			Y		Y
Quarter FE × FF12 Industry FE				Y	Y
Standard Errors	Clustered by Firm and by Quarter				
Observations	17233	17233	17233	17233	17094
R2	0.509	0.526	0.573	0.624	0.664

Table 4: **Firm-Specific Fund Flows and Structure of Total Debt Outstanding.** These tables examine how loan flows and bond flows affect the structure of total debt outstanding in the cross section of firms, according to Regression 4:

$$Loan|FloatingRatio_{j,t} = \beta_1 LoanFundFlow_{j,t-h,t} + \beta_2 BondFundFlow_{j,t-h,t} + \gamma Controls + FE + \epsilon_{j,t}$$

Panel A focuses on the one-year horizon ($h = 4$) and examines the ratio of loan debt (Column 1) or floating-rate debt (Column 2) to total debt outstanding. Panel B focuses on the floating-rate ratio and examines different horizons, from one year ($h = 4$) to four years ($h = 16$). $LoanFundFlow$ and $BondFundFlow$ measure firm-specific fund flows according to Equation 2.

Panel A: Different Measures of Debt Structure

Dependent Variable (% of Total Debt)	Loan Ratio	Floating-Rate Ratio
	(1)	(2)
Loan Fund Flow (%)	0.642***	0.661***
	(3.384)	(3.944)
Bond Fund Flow (%)	-0.570***	-0.606***
	(-4.269)	(-3.790)
Lagged Ratio (%)	0.507***	0.595***
	(15.550)	(20.398)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating	
Firm FE	Y	Y
Leverage Decile FE × Quarter FE	Y	Y
FF12 Industry FE × Quarter FE	Y	Y
Standard Errors	Clustered by Firm and by Quarter	
Observations	32007	32007
R2	0.847	0.809

Panel B: Different Horizons of Fund Flows

Dependent Variable	Floating-Rate Debt / Total Debt (%)			
Horizon	t to t+4	t to t+8	t to t+12	t to t+16
	(1)	(2)	(3)	(4)
Loan Fund Flow (%)	0.661***	0.805***	0.773***	1.033***
	(3.944)	(4.072)	(2.972)	(3.081)
Bond Fund Flow (%)	-0.606***	-0.656***	-0.528***	-0.277**
	(-3.790)	(-3.919)	(-3.076)	(-2.521)
Lagged Floating Ratio (%)	0.595***	0.363***	0.128***	0.048*
	(20.398)	(8.042)	(3.872)	(1.776)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating			
Firm FE	Y	Y	Y	Y
Leverage Decile FE × Quarter FE	Y	Y	Y	Y
FF12 Industry FE × Quarter FE	Y	Y	Y	Y
Standard Errors	Clustered by Firm and by Quarter			
Observations	32007	28116	24384	20937
R2	0.809	0.778	0.771	0.772

Table 5: **Firm-Specific Fund Flows and Issuance Costs.** This table examines how firm-specific loan fund flows and bond fund flows affect issuance costs, according to Regression 5:

$$OfferingSpread_{d,j} = LoanFundFlow_{j,t-4,t} + BondFundFlow_{j,t-4,t} + \gamma Controls + FE + \epsilon_d$$

Column 1 (2) examines the offering spreads on the universe of loans (bonds) issued by speculative-grade firms from 2010 to 2024. $LoanFundFlow$ and $BondFundFlow$ measure firm-specific fund flows over the previous year from Equation 2. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable	Loan Offering Spread (bps)	Bond Offering Spread (bps)
	(1)	(2)
Lagged Loan Fund Flow (%)	-21.444*	-1.504
	(-1.975)	(-0.212)
Lagged Bond Fund Flow (%)	-2.467	-13.486**
	(-0.984)	(-2.455)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Years to Maturity, Log Issuance Amount	
Firm FE	Y	Y
Rating FE × Quarter FE	Y	Y
Industry FE × Quarter FE	Y	Y
Standard Errors	Clustered by Quarter	
Observations	4695	2429
R2	0.557	0.707

Table 6: **Flow-Induced Debt Structure and Investment Sensitivity to Monetary Policy.** This table examines the sensitivity of capital expenditures to federal funds rate changes in the cross section of firms, according to Regression 6:

$$CapEx_{j,t,t+4} = \beta \Delta FFR_{t,t+1} \times FundFlow_{j,t-8,t} + \gamma Controls + FE + \epsilon_{j,t,t+4}$$

and Regression 7:

$$CapEx_{j,t,t+4} = \beta \Delta FFR_{t,t+1} \times FloatingRatio_{j,t} + \gamma Controls + FE + \epsilon_{j,t}$$

The dependent variable is capital expenditures from quarter-end t to $t+4$, normalized by total assets. Lagged loan fund flows and lagged bond fund flows (Equation 2) are measured from quarter-end $t-8$ to t. Floating-rate ratio (including debt maturing within one year) is measured as of quarter-end t. Columns 1 and 2 are estimated through ordinary least squares. Column 3 is estimated through two-stage least squares, using firm-specific fund flows (Equation 2) and their interactions with rate changes as instruments. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable	Capital Expenditure (% of Total Assets)		
Specification	OLS (1)	OLS (2)	2SLS (3)
Lagged Loan Fund Flow (%)	0.009 (1.279)		
× ΔFederal Funds Rate (p.p.)	-0.101** (-2.207)		
Lagged Bond Fund Flow (%)	-0.013 (-1.335)		
× ΔFederal Funds Rate (p.p.)	0.088*** (2.603)		
Floating-Rate Ratio (%)		0.003 (1.229)	0.015 (0.895)
× ΔFederal Funds Rate (p.p.)		-0.009* (-1.786)	-0.118** (-2.413)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × ΔFederal Funds Rate		
Firm FE	Y	Y	Y
Leverage Decile FE × Quarter FE	Y	Y	Y
FF12 Industry FE × Quarter FE	Y	Y	Y
Standard Errors	Clustered by Firm and by Quarter		
Observations	27587	27587	27587
R2	0.824	0.821	
Cragg-Donald F-statistic			48.693

Table 7: **Flow-Induced Debt Structure and Monetary Sensitivity of Other Cash Flow Variables.** This table estimates the monetary sensitivity of other cash flow variables, according to Regression 7:

$$Y_{j,t,t+4} = \beta \Delta FFR_{t,t+1} \times FloatingRatio_{j,t} + \gamma Controls + FE + \epsilon_{j,t}$$

Dependent variables include interest expense, net debt issuance, net equity issuance, change in cash holding, and operating income from quarter-end t to $t+4$, normalized by total assets. The regression is estimated through two-stage least squares, using firm-specific fund flows (Equation 2) and their interactions with rate changes as instruments. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable (% of Total Assets)	Interest Expense	Net Debt Issuance	Net Equity Issuance	ΔCash Holding	Operating Income
	(1)	(2)	(3)	(4)	(4)
Instrumented Floating-Rate Ratio (%)	0.004	-0.026	0.032	-0.038	-0.047
	(1.143)	(-0.542)	(1.521)	(-1.147)	(-1.460)
× ΔFederal Funds Rate (p.p.)	0.007*	-0.097***	0.029	-0.005	-0.019
	(1.889)	(-2.883)	(0.857)	(-0.170)	(-0.309)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × ΔFederal Funds Rate				
Firm FE	Y	Y	Y	Y	Y
Leverage Decile FE × Quarter FE	Y	Y	Y	Y	Y
FF12 Industry FE × Quarter FE	Y	Y	Y	Y	Y
Standard Errors	Clustered by Firm and by Quarter				
Observations	27587	27587	27587	27587	27587
Cragg-Donald F-statistic	48.693	48.693	48.693	48.693	48.693

Table 8: **Flow-Induced Debt Structure and Investment Sensitivity to Monetary Policy, Heterogeneity.** These tables examine firm investment sensitivity to monetary policy in different subsamples, using 2SLS Regression 7. Panel A (B) examines subsamples sorted by interest coverage (leverage). t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Panel B: By Interest Coverage Tercile

Dependent Variable	Capital Expenditure (% of Total Assets)		
Interest Coverage Tercile	High	Medium	Low
	(1)	(2)	(3)
Instrumented Floating-Rate Ratio (%)	0.029*	0.006	-0.002
	(1.745)	(0.263)	(-0.072)
× ΔFederal Funds Rate (p.p.)	0.036	-0.028	-0.199**
	(1.012)	(-1.030)	(-2.484)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × ΔFederal Funds Rate		
Firm FE	Y	Y	Y
Leverage Decile FE × Quarter FE	Y	Y	Y
FF12 Industry FE × Quarter FE	Y	Y	Y
Standard Errors	Clustered by Firm and by Quarter		
Observations	9104	9202	9195
Cragg-Donald F-statistic	19.046	52.574	34.204

Panel A: By Leverage Tercile

Dependent Variable	Capital Expenditure (% of Total Assets)		
Lverage Tercile	Low	Medium	High
	(1)	(2)	(3)
Instrumented Floating-Rate Ratio (%)	0.010	-0.003	-0.101
	(0.307)	(-0.183)	(-0.459)
× ΔFederal Funds Rate (p.p.)	-0.001	-0.046***	-0.145*
	(-0.057)	(-2.791)	(-1.935)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × ΔFederal Funds Rate		
Firm FE	Y	Y	Y
Leverage Decile FE × Quarter FE	Y	Y	Y
FF12 Industry FE × Quarter FE	Y	Y	Y
Standard Errors	Clustered by Firm and by Quarter		
Observations	9124	9211	9108
Cragg-Donald F-statistic	30.634	46.098	23.404

Table 9: **Flow-Induced Debt Structure and FOMC Announcement Returns.** The table examines stock return sensitivity to interest rate shocks during two-day windows around FOMC announcements in the cross section of firms, according to Regression 8:

$$Return_{j,\tau} = \beta MPS_\tau \times FloatingRatio_{j,\tau-1} + \gamma Controls + \epsilon_{j,\tau}$$

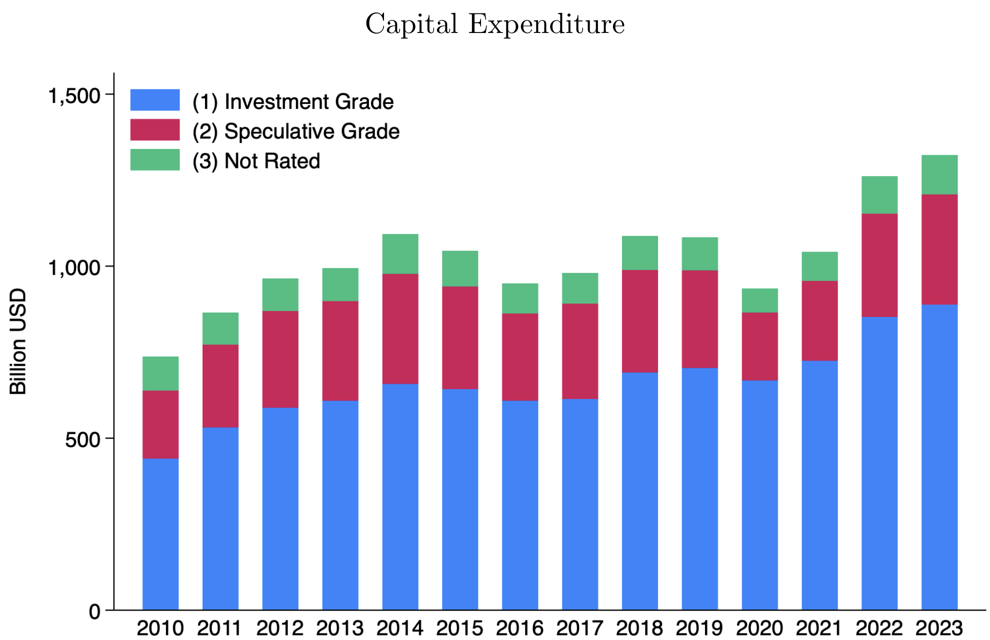
$Return$ denotes the two-day return around an FOMC announcement. MPS denotes monetary policy surprises from Bauer and Swanson (2023). $FloatingRatio$ is instrumented with firm-specific fund flows defined according to Equation 2. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable	FOMC Announcement Return (%)			
	OLS (1)	OLS (2)	OLS (3)	2SLS (4)
Monetary Policy Surprise	-15.789 (-1.627)			
Lagged Loan Fund Flow (%)		0.009 (0.570)		
× Monetary Policy Surprise		-0.351* (-1.952)		
Lagged Bond Fund Flow (%)		0.014 (1.114)		
× Monetary Policy Surprise		0.148** (2.134)		
Floating-Rate Ratio (%)			0.000 (0.020)	-0.009 (-0.083)
× Monetary Policy Surprise			0.058 (1.339)	-0.297** (-2.029)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × Monetary Policy Surprise			
Firm FE	Y	Y	Y	Y
Leverage Decile FE × FOMC FE		Y	Y	Y
FF12 Industry FE × FOMC FE		Y	Y	Y
Standard Errors	Clustered by Firm and by FOMC			
Observations	57394	57394	57394	57394
R2	0.033	0.458	0.452	
Cragg-Donald F-statistic				35.672

Internet Appendix

Appendix A Additional Figures

Figure A1: **Aggregate Real Variables.** These figures plot aggregate capital expenditures (Panel A) and employment (Panel B) for publicly traded U.S. non-financial firms, separately for investment-grade firms, speculative-grade firms, and unrated firms.



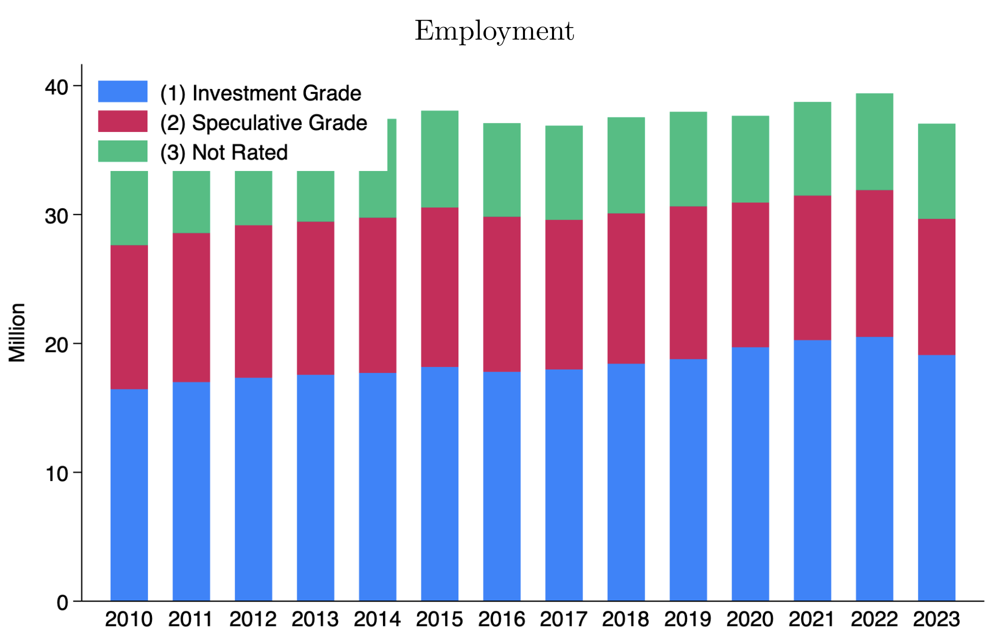
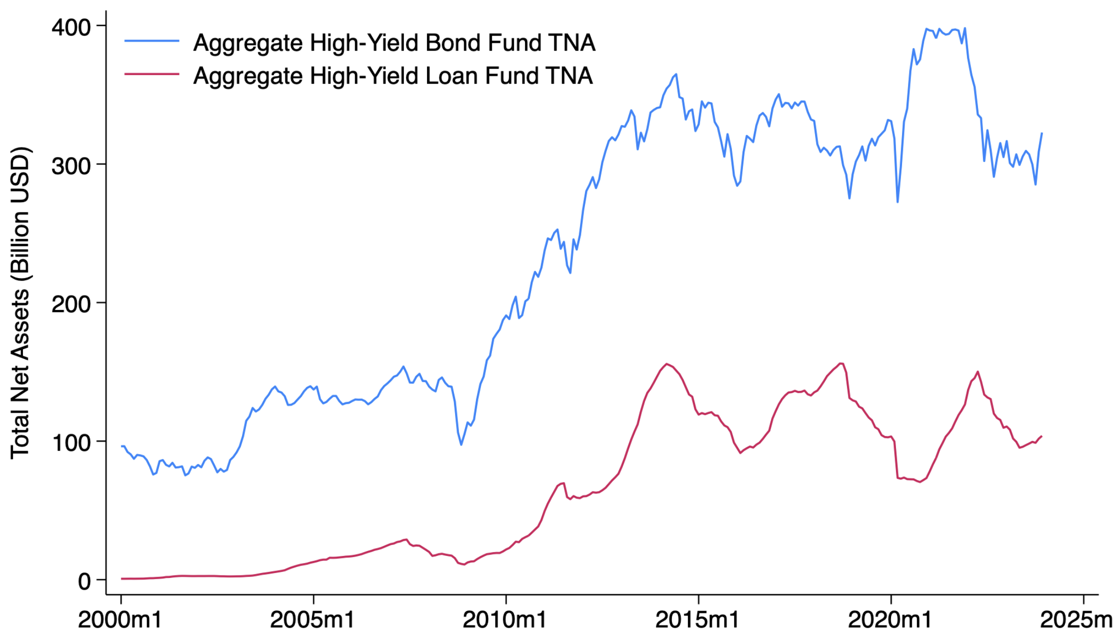


Figure A2: **Size and Flows of Fixed Income Mutual Funds.** These figures plot the aggregate size (Panel A) and flows (Panel B) for our sample of high-yield bond funds and loan funds.

Fund Size



Fund Flows

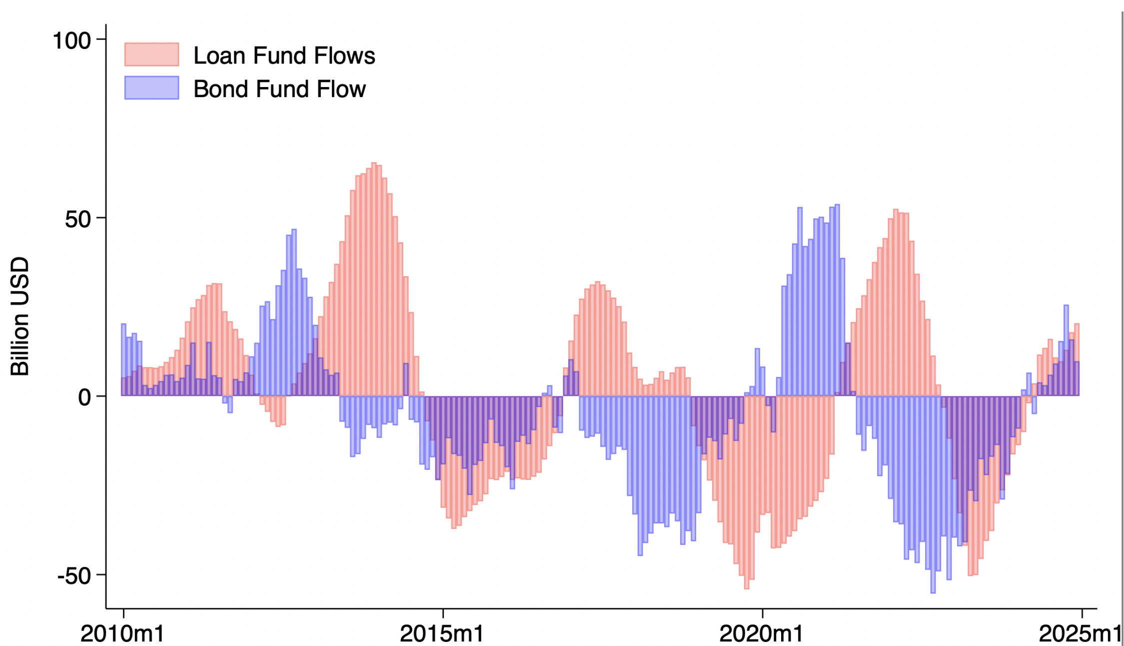
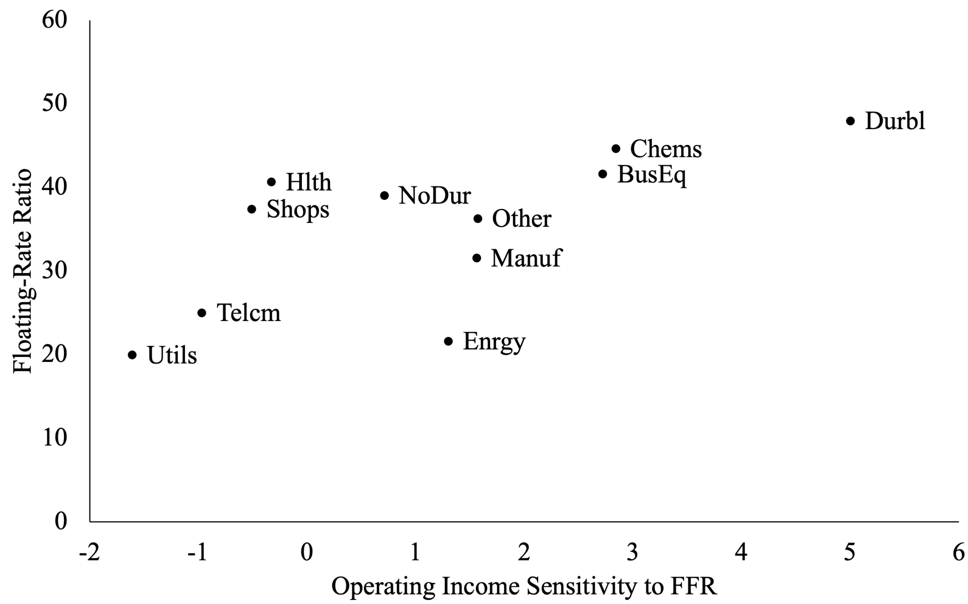


Figure A3: **Endogeneity of Observed Floating-Rate Ratio.** This figure illustrates the endogeneity of floating-rate ratio using the cross section of Fama-French 12 industries (excluding financial companies). The y-axis is the ratio of floating-rate debt to all debt outstanding. The x-axis is the operating income sensitivity to federal funds rate changes, measured as β from: $OperatingIncome_t = \alpha + \beta \Delta FFR_t + \epsilon_t$.



Appendix B Additional Tables

Table A1: **Firm-Specific Fund Flows and Structure of Debt Outstanding, Piecewise Regression.** This table runs a piecewise version of Regression 4 to detect non-linearity in the relationship between fund flows and debt structure.

Dependent Variable (% of Total Debt)	Loan Ratio	Floating-Rate Ratio
	(1)	(2)
Loan Fund Flow (%) × 1[High]	0.704***	0.725***
	(3.043)	(3.126)
Loan Fund Flow (%) × 1[Medium]	0.193*	0.207
	(1.793)	(1.648)
Loan Fund Flow (%) × 1[Low]	1.043***	0.905***
	(3.684)	(3.936)
Bond Fund Flow (%) × 1[High]	-0.896***	-0.852***
	(-4.208)	(-4.016)
Bond Fund Flow (%) × 1[Medium]	-0.326**	-0.308**
	(-2.418)	(-2.070)
Bond Fund Flow (%) × 1[Low]	-0.595***	-0.667***
	(-3.801)	(-4.009)
Lagged Ratio (%)	0.512***	0.589***
	(15.488)	(20.276)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating	
Firm FE	Y	Y
Leverage Decile FE × Quarter FE	Y	Y
FF12 Industry FE × Quarter FE	Y	Y
Standard Errors	Clustered by Firm and by Quarter	
Observations	32007	32007
R2	0.853	0.816

Table A2: **Flow-Induced Debt Structure and Investment Sensitivity to Monetary Easing vs. Tightening.** This table examines the sensitivity of capital expenditures separately to positive vs. negative federal funds rate changes, according to Regression 6 and Regression 7. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable	Capital Expenditure (% of Total Assets)		
Specification	OLS	OLS	2SLS
	(1)	(2)	(3)
Lagged Loan Flow	0.007		
	(1.194)		
× 1[ΔFFR ≥ 0] × ΔFFR	-0.121**		
	(-2.314)		
× 1[ΔFFR ≤ 0] × ΔFFR	-0.094*		
	(-1.933)		
Lagged Bond Flow	-0.012		
	(-1.328)		
× 1[ΔFFR ≥ 0] × ΔFFR	0.124**		
	(2.595)		
× 1[ΔFFR ≤ 0] × ΔFFR	0.067		
	(1.629)		
Floating-Rate Ratio		0.004	0.011
		(1.307)	(0.886)
× 1[ΔFFR ≥ 0] × ΔFFR		-0.011*	-0.135**
		(-1.903)	(-2.436)
× 1[ΔFFR ≤ 0] × ΔFFR		0.001	-0.082*
		(0.502)	(-1.862)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × ΔFederal Funds Rate		
Leverage Decile FE × Quarter FE	Y	Y	Y
FF12 Industry FE × Quarter FE	Y	Y	Y
Standard Errors	Clustered by Firm and by Quarter		
Observations	27587	27587	27587
R2	0.838	0.829	
Cragg-Donald F-statistic			40.687

Table A3: **Flow-Induced Debt Structure and FOMC Announcement Returns, Alternative Shock Measures.** This table examines stock return sensitivity to Gurkaynak et al. (2005) path shocks during two-day windows around FOMC announcements in the cross section of firms, according to Regression 8. t-statistics are reported in parentheses. *, **, and *** denote p-values less than 0.10, 0.05, and 0.01, respectively.

Dependent Variable	FOMC Announcement Return (%)			
	OLS (1)	OLS (2)	OLS (3)	2SLS (4)
GSS Path Shock	-5.486 (-1.274)			
Lagged Loan Fund Flow (%)		0.008 (0.510)		
× GSS Path Shock		-0.175** (-2.172)		
Lagged Bond Fund Flow (%)		0.015 (1.177)		
× GSS Path Shock		0.165* (1.932)		
Floating-Rate Ratio (%)			0.001 (0.207)	0.003 (0.034)
× GSS Path Shock			0.013 (0.717)	-0.191** (-1.990)
Controls	Log Total Assets, Cash Ratio, Leverage, Profitability, Credit Rating, Lagged Floating-Rate Ratio × GSS Path Shock			
Firm FE	Y	Y	Y	Y
Leverage Decile FE × FOMC FE		Y	Y	Y
FF12 Industry FE × FOMC FE		Y	Y	Y
Standard Errors	Clustered by Firm and by FOMC			
Observations	57394	57394	57394	57394
R2	0.026	0.456	0.452	
Cragg-Donald F-statistic				36.259

Appendix C Variable Definitions

- Log total assets: the logarithm of total assets (AT)
- Cash ratio: cash holdings (CHE) divided by total assets (AT)
- Total debt: debt in current liabilities (DLC) and long-term debt ($DLTT$)
- Leverage: total debt divided by total assets
- Profitability: operating income ($OIBDP$) divided by total assets (AT)
- Credit rating: S&P issuer credit rating converted to numerical scale, AAA = 1, AA+ = 2, ..., CCC = 18, CCC- = 19
- Interest coverage: the ratio of operating income ($OIBDP$) to interest expense ($XINT$), bounded below by $1
- Real investment: capital expenditures ($CAPX$)
- Interest expense: interest and related expense ($XINT$)
- Net debt issuance: long-term debt issuance ($DLTIS$) minus long-term debt reduction ($DLTR$)
- Net equity issuance: sale of common and preferred stock ($SSTK$) minus purchase of common and preferred stock ($PRSTKC$) and cash dividends (DV)