Silent Swing: Do Bond Mutual Funds Tilt the Valuations of Their Holdings in Response to Flows?*

Jaewon Choi[a] Mathias Kronlund[b] Ji Yeol Jimmy Oh[c]

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Abstract

Mutual funds face risks of dilution from trading costs when investors place purchase or redemption orders. To deal with this risk, the SEC in 2018 started allowing U.S. mutual funds to change their net asset value (NAV) up or down by a prescribed amount in response to abnormally large flows—a practice known as swing pricing. However, no U.S. fund has thus far chosen to adopt this practice. This paper provides evidence that funds can employ an alternative way to change the value of their portfolios in response to flows, namely by changing the valuation of their underlying holdings. We refer to this phenomenon as "silent swing pricing," as these swings in valuations are not announced and lack transparency, but still effectively achieve the same goal. Focusing on active fixed-income funds from mid-2008 to 2022, we find that a fund's valuation gap of a particular bond relative to peer funds' valuations is positively related to that fund's same-day flows. The sensitivity of valuations to flows is greater when a fund experiences outflows than when it has inflows, and when it holds more illiquid securities. The extent of silent swing pricing is attenuated, however, by return smoothing incentives when funds have poor past performance and fragile investor base. We show this practice has persisted even after the 2018 SEC rule change.

JEL Classification: G12, G18, G23

Keywords: Fund flows; swing pricing; holding valuation; open-end structure; flow fragility

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[a] Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea; telephone: +82 (0)2 880 6379. E-mail: jaewchoi@snu.ac.kr.

[b] University of Illinois at Urbana-Champaign, 515 E Gregory St., Champaign, IL 61820; telephone: (217) 244-2631. E-mail: kronlund@illinois.edu.

[c] Sungkyunkwan University, 25-2 Sungkyunkwan-ro, Jongno-gu, Seoul 03063, Korea; telephone: +82 (0)2 760-0460. E-mail: jyjoh@skku.edu.

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1. Introduction

When investors purchase or redeem shares of a mutual fund, the fund needs to trade the underlying securities to meet those orders from investors. If this trading is costly, the resulting trading activity can harm the remaining fund shareholders by "diluting" the value of their shares. Further exacerbating this problem is the risk that additional investors will anticipate such dilution and rush to sell their shares before others to gain a first-mover advantage, a dynamic similar to bank runs (Goldstein, Jiang, and Ng, 2017; Capponi, Glasserman, and Weber, 2020). One way to address this problem is to give the investors who withdraw from a fund a little less than the fund's underlying net asset value (NAV), and thus have these redeeming investors thereby internalize some of the trading costs they impose on others, and vice versa. A way to implement such a policy is through "swing pricing," whereby a fund automatically lowers the NAV on days when it experiences a lot of withdrawals and vice versa.

The Financial Conduct Authority in the U.K. was an early adopter in allowing funds to engage in swing pricing.[2] Following suit, the U.S. Securities and Exchange Commission (SEC) has allowed funds the option to implement swing pricing since November 2018. To do so, U.S. funds need to describe in their registration statement what level of flow triggers the adjustment of the NAV (the "swing threshold") and how much to adjust the NAV up or down based on that level of flow (the "swing factor"). However, the uptake of this option has been tepid as U.S. mutual funds remain reluctant to formally implement swing pricing.[3] In 2022, the SEC proposed another rule which would *mandate* that funds implement swing pricing, although this rule has been met with skepticism from industry groups.[4] One of the reasons why funds may be reluctant to embrace swing pricing is the

[2] Jin, Kacperczyk, Kahraman, and Suntheim (2022) examine 34 funds in the U.K. that adopted swing pricing between 2006 and 2016.
[3] See, for example, Financial Times, Nov 2, 2022: "SEC Proposes mutual fund-pricing rule to protect long-term investors," available at https://www.ft.com/content/b5217ae6-a723-4c9c-ba68-ef78f5c47d74
[4] See https://www.federalregister.gov/documents/2022/12/16/2022-24376/open-end-fund-liquidity-risk-management-programs-and-swing-pricing-form-n-port-reporting. A report commissioned by the Chamber of

inflexibility in swing mechanisms proposed in the new rule. In contrast, funds may prefer more flexibility around when to swing the fund's price and by how much, depending on the circumstances.

The idea behind the regulator's prescribed method of swing pricing is that a fund will first add up the value of all its holdings to calculate the NAV and then adjust this number up or down by a certain percentage in response to flows. Yet, there exists another possible way through which funds could adjust what investors get when they sell a fund, namely through funds' discretion in the valuation of the underlying holdings. Funds that hold highly traded securities with widely available prices do not have much discretion when valuing these securities. However, whenever funds hold illiquid securities, they have such discretion and could thus "tilt" these underlying valuations up or down. If funds tilt the valuations of their securities down on days when flows are highly negative and vice versa, this would, in effect, work the same as swing pricing. We refer to this possible alternative strategy of adjusting the amounts that investors receive when redeeming from a fund (or pay when investing in the fund) through the funds' use of discretion in valuing holdings as "silent swing pricing." If funds engage in such silent swing pricing, they could retain many similar benefits as actually implementing formal swing thresholds and swing factors, but this could be implemented more flexibly and without explicit disclosure of a swing pricing policy, which may not be popular with investors.

In this paper, we investigate whether funds engage in silent swing pricing. Our setting specifically focuses on active fixed-income mutual funds that hold corporate bonds. We ask whether these funds raise bond valuations in response to inflows and lower them in response to outflows. We focus on active bond funds since engaging in silent swing pricing requires discretion when valuing a fund's holdings: securities that are heavily traded and have widely available prices, like equities, leave little room for discretion. In contrast, when funds hold less-liquid securities or when their bonds have

Commerce represents an example of the industry's perspective: https://www.uschamber.com/assets/documents/Swing-Pricing_Hard-Close-Impact-on-Retirement_FINAL-2.pdf no recent prices from trades, the ability to engage in silent swing pricing grows. Likewise, the benefits to funds of engaging in swing pricing also grow when securities are less liquid since the externality costs from flow-based trading tend to be greater for thinly traded bonds than for highly traded equities.

Our sample uses Morningstar data, starting in July 2008 when this database reports data on daily flows to funds. To study whether a fixed-income fund values a particular bond relatively high or low, we compare each fund to the median valuation reported by peer funds that hold the same bond. Since funds do not report their valuations of individual holdings daily, we focus on each month-end date when the vast majority of all funds do report their valuations for each individual bond holding (e.g., Cici, Gibson, Merrick, 2011). On these month-end days, we can thus observe how a fund's "tilt" when valuing bonds (relative to its peers' valuations for the same set of bonds) relates to the fund's flow on that day. For the main empirical analysis, we focus particularly on funds' valuations of corporate bonds, because corporate bonds tend to have varying degrees of illiquidity, which provides funds with varying degrees of discretion in valuing these bonds. In addition, corporate bonds tend to be widely held across many different funds, enabling us to better compute a price benchmark based on a larger set of peer funds' valuations.

Our baseline tests examine the extent to which funds, on average, engage in silent swing pricing. To do so, we perform fund-bond-month level regressions where the outcome variable is the price deviation for a fund's valuation of a particular bond on a given month-end date (defined as the proportional difference between a fund's value for a particular bond compared to the median across all funds) and the independent variable is each fund's flow on that same day. We control for bond-by-time fixed effects and style-by-time fixed effects to isolate variation only across funds that hold the same bond and that belong to the same style category at the same time; these fixed effects thus account for possible macro-, industry-, or style-level variation in valuations and flows over time.

Our main findings show—consistent with silent swing pricing—that funds' deviations in the valuations of individual bonds compared to other funds are positively related to their flows on that particular day. That is, funds with high daily inflows tend to value their bonds higher than those holding the same bond but with lower flows that date. Economically, at the fund-bond-month level, we find that a fund adjusts bond prices on average by around 4 basis points in response to a 1-percent flow. This magnitude is even higher, around 6 basis points higher valuations in response to a 1-percent flow when we focus on high-yield bonds, which tend to be less liquid and have greater room for discretion in valuation.

Swing pricing only serves to internalize the trading costs if they respond to same-day (i.e., contemporaneous) flows. Consistent with the unique role of the contemporaneous flow for the silent-swing-pricing mechanism, we find that the previous days' flows have the opposite effect for pricing; a fund that has had lower flows than others in the recent past (but has similar flows on the contemporaneous day), tend to price their bonds higher. This latter effect is consistent with performance-smoothing: funds that have low/negative flows may be more worried about their performance and, if anything, on average, tend to price up to boost their returns. But this performance-smoothing mechanism—which predicts a negative relation between past-day flows and valuations—is dominated by a silent-swing-pricing mechanism (which predicts a positive relation) when we examine the relation between the same-day flow and funds' valuations of their securities.

As a placebo test, we further show that the positive relation between same-day flows and bond-level valuations is absent for fixed-income ETFs holding these securities; silent swing pricing is thus unique to only mutual funds. This is consistent with the fact that ETFs' traded prices can deviate from the NAV in response to abnormal investor flows, which attenuates the need for management companies to change how ETFs value bonds in response to these inflows and outflows.

Next, we examine the asymmetry in the funds' silent swing pricing in response to inflows vs. outflows. Theoretically, the concern around trading cost externalities is greatest when a fund's flows are negative. This happens for at least two reasons. First, when flows are negative, funds must sell quickly if they do not have sufficient liquidity buffers, and the more intense trading is likely to result in higher trading costs and price impact. By contrast, funds can choose to trade into bonds more slowly over time if they receive abnormally high inflows. Perhaps even more seriously, large flows on the downside have the potential to induce run-like mechanics whereby investors seek to sell shares in the fund before others; these types of run-like dynamics are less serious when considering investors' response to positive flows (Chen, Goldstein, and Jiang, 2010; Goldstein, Jiang, and Ng, 2017; Falato, Goldstein, and Hortaçsu, 2021).

Consistent with the hypothesis that funds have a greater incentive to use silent swing pricing when they face negative flows, we find that the relation between valuations and same-day flows is only significant when funds face negative flows. In contrast, this relation is statistically indistinguishable from zero for funds that experience positive flows. Put differently, if a fund has negative flows on a given day, it tends to price its bonds lower than other funds holding the same bond, but if it has positive flows, then it, on average, prices its bonds around the same as those other funds.

Since our sample period stretches from mid-2008 to 2022, one important event that could influence swing pricing over this period is the SEC's decision in November 2018 to allow funds the option to formally implement a swing pricing policy at the fund level. If funds use this option to engage in a more formal form of swing pricing, we might expect funds to engage less in silent swing pricing. On the other hand, since funds have not adopted the SEC's prescribed 2018 rule for swing pricing, we might expect silent swing pricing to persist. Indeed, consistent with the latter hypothesis, we find no difference in the extent to which funds engage in silent swing pricing before and after November 2018. This suggests that funds may view "silent swing pricing" as a more flexible (but less transparent) way to implement the same goal of making investors who buy or sell a fund internalize the trading costs they impose on other investors.

We next proceed to study cross-sectional drivers of silent swing pricing. First, silent swing pricing is more feasible when funds have more discretion around valuations. Consistent with more discretion, we find that funds' valuations for bonds tend to respond more to the fund's same-day flows when a bond has high Amihud illiquidity, no traded price (especially for high-yield bonds with no prices), and when a bond has exhibited greater price volatility.

We also investigate the role of funds' strategic choice between performance-smoothing using bond valuations (which would predict a negative relation between flows and valuations) vs. silent swing pricing (which predicts a positive relation). Specifically, we test whether funds we expect to have a greater incentive to engage in return-smoothing exhibit a lower degree of silent swing pricing. The underlying idea is that silent swing pricing may not be in a fund's best interest if the fund has suffered poor past performance and when it has a fragile investor flow base. Consistent with poorly performing funds having return smoothing incentives, which attenuate silent swing pricing, we find that funds that belong to the bottom 30% in terms of their past performance exhibit the lowest degree of silent swing pricing. Similarly, we find less silent swing pricing whenever a fund is younger, if it has suffered severely low/negative flows over recent months, or if it belongs to a fund family with a smaller market share—all measures that proxy for funds' need to establish a good track record with investors. In contrast, we find evidence that funds with load fees tend to have a weaker relation between bond valuations and same-day fund flows, suggesting that additional protection against opportunistic flows reduces funds' need to engage in silent swing pricing.

Next, we aggregate the bond-level swing pricing to the portfolio/fund level, and we show that the economic magnitude of silent swing pricing amounts to around 1.5 bps per 1% investor flow. This effect is asymmetric: it is around four bps per unit of outflows but statistically indistinguishable from zero in the case of inflows. As a benchmark, we compare this magnitude to the proportional difference between an ETF's traded price and its NAV, which is the degree of "swing pricing" set by the market participants through their trading activities of ETFs. We find that a 1% inflow increases the ETF trading premium by around 3.3 bps, and a 1% outflow decreases it by 5.1 bps. Thus, open-end active funds' reluctance to implement silent swing pricing in response to inflows appears to be the main difference between the degree of (silent) swing pricing by bond fund management companies and how ETF prices respond to flows.

Finally, we study whether funds' future flows or future flow volatility are affected by their degree of silent swing pricing. These findings hint at why fund management companies exhibit such strong asymmetry. Specifically, we find that silent swing pricing appears to boost subsequent flows when implemented in response to outflows, but the opposite pattern is observed when funds' pricing responds to inflows. This highlights the importance of distinguishing inflows vs. outflows when discussing future regulatory changes to the swing pricing rule.

We contribute to the literature in the following ways. First, we contribute to the existing literature that examines the role of formal, explicit swing pricing (Capponi, Glasserman, and Weber, 2020; Jin, Kacperczyk, Kahraman, and Suntheim, 2022) and alternative means by which the externalities of investor redemption orders may be internalized, for example through the use of in-kind redemption (Agarwal, Ren, Shen, and Zhao, 2023). We identify an alternative (more informal) form of swing pricing, which acts through the use of discretion in bond valuation, that we show that funds utilize instead of implementing formal swing pricing. This practice enables funds to retain greater flexibility in responding to investor flows.

We further contribute to the growing literature that examines the potential fragility in the open-end structure of money market and mutual funds in the presence of illiquidity and trading costs and the impact of funds on the wider asset markets (Schmidt, Timmermann, and Wermers, 2016;

Goldstein, Jiang, and Ng, 2017; Shek, Shim, and Shin, 2018; Li, Li, Machiavelli, and Zhou, 2021; Jiang, Li, Sun, and Wang, 2022; Li, O'Hara, and Zhou, 2022; Ma, Xiao, and Zeng, 2022; Cipriani and La Spada, 2023). We show that, even though mutual funds have remained reluctant to formally adopt swing pricing, they appear to engage in a different, more flexible form of swing pricing through their use of discretion in bond valuations.

Finally, our work is closely related to the literature that examines mutual funds' use of discretionary valuation of their underlying securities and their subsequent holdings disclosure and reporting (Cici, Gibson, and Merrick, 2011; Chen, Cohen, and Gurun, 2021; Agarwal, Barber, Cheng, Hameed, and Yasuda, 2023; Atanasov, Merrick, and Schuster, 2023). We contribute to this strand of the literature by identifying investor flows as an important consideration in how a fund values its holdings relative to its peers. We further show this practice is more widespread when the underlying securities are illiquid and sparsely traded, which is when funds have more discretion in valuation.

2. Data and Variable Construction

In this section, we describe how we construct the key variable of interest, namely how an active bond fund's reported price for a given bond differs from those of its peers, using the monthly holdings information from the Morningstar database. We further explain how fund flows and the other variables are constructed, and we report summary statistics.

2.1. Reported price deviation

We use the monthly holdings information from the Morningstar database to construct the reported price deviation measure. This database contains both the par value and the self-reported market value of each security held by a fund, which enables us to calculate a fund's reported price for a given bond at each month-end date. For each security-date, we then calculate the median price reported across all U.S. fixed income open-end funds and ETFs holding the same security on the same date. We use this to calculate the price *deviation* (calculated for each fund-bond-month), which is the difference between a fund's reported price for a given bond and the median reported price at the month-end date, and where this difference is further normalized by the median reported price. As in Cici, Gibson, and Merrick (2011), we require a minimum of three available reported prices to calculate the median reported price, and we exclude reported prices below $50 or above $200 from the analysis. Since funds may tilt the value for only some of the bonds they hold (e.g., only their less liquid securities), and as this tilt may vary over time, the unit of observation in the main analysis is a fund-bond-month.

We merge this holdings database from Morningstar with the CRSP MF database using the CUSIP identifier of the share classes comprising the portfolio, following the methodology outlined in Pástor, Stambaugh, and Taylor (2015). For the main part of the empirical analysis, we focus our attention on the reported prices of U.S. domestic active bond funds.[5] In some instances, we further contrast our baseline empirical findings from active bond mutual funds with results from a sample of U.S. domestic bond ETFs. We divide the sample of general and corporate bond funds into investment-grade (IG) and high-yield (HY) mandates using the Lipper objective codes following the classification outlined in Choi, Kronlund, and Oh (2022).

2.2. Fund Characteristics

To establish how a fund prices its bonds in response to investor flows, we first obtain share-class-level daily flow data from the Morningstar database. The coverage of daily flow data becomes widely

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[5] U.S. domestic bond funds are defined as those with the first two letters of the CRSP objective codes "I", "IC", "IG", or "IU." We classify a fund to be an index fund if it is flagged as an index fund in either the Morningstar or CRSP MF database. We complement this with the name-based approach for index fund identification outlined in Berk and van Binsbergen (2015). If none of the approaches identifies a fund as an index fund, we classify it as an active fund.

available for bond funds from July 2008 onwards. We aggregate the share class-level flows into portfolio-level flows. Since portfolio holdings are reported at month-end values, we define the last trading day of a given month as day 0. We then compute flows over the following non-overlapping horizons: day 0 (i.e., same day as the reported month-end), -1, [-5: -2], [-10: -6], and [-20: -11]. In addition to daily flows, we collect daily returns over the same horizons within a given month using the CRSP MF database. We use the previous-day total net assets (TNAs) of all share classes sharing the same fund identifier (*crsp_cl_grp*) as weights to average share-class-level daily returns into fund-level daily returns.

In our analysis, we control for several fund characteristics, including log fund size, fund age, fund turnover, expense ratio, TNA-share of institutional classes, and TNA-share of load fee classes. All fund characteristics are computed using the information in the CRSP MF database, and we take the weighted average of share-class-level information using the previous month-end TNA of each share class as the weight, with the exception of fund size, which takes the sum of all share class TNAs, and fund age, which is the maximum of all share classes.

We classify a share class as a load fee class if there is a non-zero front load fee for an investment size of $1 million or a non-zero rear load fee, similar to Choi, Kronlund, and Oh (2022). To account for a fund's longer-run performance, we further calculate each fund's returns over three-month, six-month, or year-to-date horizons and sort our funds into top 30%, mid 40%, and bottom 30% relative to their Lipper objective peers at the same point in time.

2.3. Bond characteristics

The Morningstar holdings database provides information on the security type (*sectype*). We use this to classify bonds into: (i) corporate bonds, (ii) municipal bonds, (iii) Treasury bonds, (iv) all other bonds (which include agency and ABS bonds), (v) cash and equivalents, and (vi) all other securities. We obtain information regarding amounts outstanding and credit ratings for each bond at each month-end from the Mergent FISD database. For bonds with two credit ratings, we take the lower of the two ratings, while we take the median of the credit ratings for bonds with three available ratings. This allows us to classify the sample of corporate bonds into IG- and HY-rated bonds. For our baseline analysis, we focus on all dollar-denominated corporate bonds that have credit rating information available from the Mergent FISD database.

We further collect corporate bond trading and illiquidity data from the Enhanced TRACE database. We first follow the TRACE cleaning procedure outlined in Dick-Nielsen (2014) to correct for known errors. Following the previous literature (e.g., Bessembinder, Maxwell, and Venkataraman, 2006), we focus on institutional trades with trade volume of $100,000 or greater to compute the daily price of a bond using either the volume-weighted average price (VWAP) or the last traded price. This enables us to calculate the standard Amihud illiquidity measure for each bond. In addition, we construct a *no traded price* indicator, which takes the value of one if a bond does not have a traded price satisfying the definition above on the last trading day of a given month.

2.4. Summary statistics

We construct our main sample for the empirical analysis of corporate bond reported price deviation by merging the Morningstar holdings and daily flow database with the information on active bond funds from the CRSP MF database and the bonds' credit ratings information from the Mergent FISD database. Our final sample covers 33,774 corporate bonds held by 753 active bond funds between July 2008 and December 2022. Table 1 outlines the summary statistics of our main variables of interest. All variables are winsorized at the 1% and 99% levels.

TABLE 1 HERE

Table 1 reveals considerable variations in the reported price for a specific bond across funds, even when the funds hold a given bond at the same time. For corporate bonds, the standard deviation of funds' reported price deviation from peers is 0.72%, with the 1st and the 99th percentile both above 2.5% in absolute magnitudes. The magnitude of cross-sectional variations is considerably greater for HY bonds (standard deviation of 0.86%) than for IG bonds (standard deviation of 0.58%). The cross-sectional standard deviations for other types of bonds are also sizable: 0.78% for municipal bonds and 0.76% for Treasury bonds, respectively.

We provide summary statistics for active bond funds, where this sample is further limited to those funds holding at least one corporate bond during our sample period. The standard deviation for daily flow and return stands at 0.34% and 0.25%, respectively, and on average, our sample funds have just under $1.8 billion in total net assets and charge 68.7 bps in annual expense ratio. As we focus on active bond funds, the average turnover is substantial at 118.6%. Regarding bond characteristics, we find HY corporate bonds to be more illiquid than their IG counterpart, as revealed by higher Amihud illiquidity measures and a higher fraction of bonds that do not have traded prices available. For example, whereas 41.2% of IG bonds do not have a traded price on the last trading day of a given month, the comparable figure for HY bonds is significantly higher at 60.4%.

Table A.1 in the Appendix provides information on how many funds and ETFs hold the same security (and report valuations) at a given month-end. We report these statistics across the full sample of bonds and separately across different bond categories (corporate, municipal, treasury, other). Corporate and Treasury bonds stand out from the rest in terms of having a wide range of funds holding a particular bond: The average number of fixed-income funds and ETFs holding the same bond is 17.3 for corporate bonds, and 17.5 for Treasuries, respectively. By contrast, the number is noticeably smaller for municipal or "other" types of bonds, at 1.9 and 2.2, respectively. Across the latter two groups of bonds, the median number of funds and ETFs holding a particular security at a given month-end is 1, making it difficult to compare a fund's pricing relative to the median valuation. Corporate bonds thus represent the main category of bonds that have both sufficient degrees of illiquidity *and* significant overlap in holdings across funds. Thus, for the remainder of the empirical analysis, we mostly focus our attention on the pricing of corporate bonds.

3. Silent Swing Pricing

In this section, we first document whether active bond funds systematically mark corporate bonds in their holdings upwards or downwards relative to other funds in response to investor flows. If funds mark the price upwards in response to high inflows, or mark bonds down in response to outflows, this practice *effectively* functions in a similar manner to swing pricing and would thus present evidence for what we refer to "silent swing pricing." We then examine whether the funds' pricing response is asymmetric, depending on whether they experience positive vs. negative flows, and we study whether the pricing behavior of these funds changed after the SEC's rule that allowed funds to formally adopt swing pricing in November 2018. We further examine whether the silent swing pricing behavior differs across investment-grade (IG) vs. high-yield (HY) bonds.

3.1. Do Mutual Funds' Valuations of their Corporate Bond Pricing Respond to Investor Flows?

We first examine whether active bond funds' pricing of corporate bonds changes in response to investor flows. To this end, we regress a fund's reported price deviation relative to its peers for a given bond at a given month-end on the fund's investor flows on the last trading day of the month. This reveals the extent to which a fund marks the corporate bond holdings differently from its peers when it faces investor inflows or outflows on that day. In addition to the day-0 fund flow, we control for past fund flows and returns over the following non-overlapping daily horizons within the past month:

day -1, [-5: -2], [-10: -6], and [-20: -11]. In addition to flow and return controls, we include both Lipper-objective-by-month and bond-by-month fixed effects. to isolate variation only across funds that hold the same bond and that belong to the same style category at the same time; these fixed effects thus account for possible macro-, industry-, or style-level variation in valuations and flows over time. These fixed effects ensure that the variation we use for measuring these effects is isolated to variation only across funds that hold the same bond and that belong to the same style category at the same time; these fixed effects thus account for possible macro-, industry-, or style-level variation in valuations and flows over time. *t*-statistics are computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective code and month; this accounts for possible correlations across funds within the same style as well as across funds within time.

TABLE 2 HERE

Column (1) of Table 2 Panel A presents the results for all corporate bonds. A 1% inflow on the last trading day of the month predicts a reported price deviation of 4.43 bps. The relation is also highly statistically significant with *t*-statistic close to 4. This finding of a positive relation between same-day flows and price deviations is thus consistent with silent swing pricing.

Notably, all measures of *past* flow and return terms (e.g., day -1) negatively predict price deviations. This pattern is more consistent with funds' incentives to engage in return-smoothing (e.g., Cici, Gibson, and Merrick, 2011). For example, if a fund has suffered poor performance (as captured directly in poor past returns, or indirectly in the form of low past returns), it may seek to slightly enhance its returns by marking up bonds relative to other funds.

When we split our sample into IG and HY bonds in columns (2) and (3), we find this tendency for silent swing pricing to be particularly strong among HY bonds. For IG bonds (in column (2)), we find the coefficient on the same-day flow (i.e., day 0 flow) to be 2.89, with statistical significance at the 5% level, suggesting that a 1% inflow translates into a temporary price mark-up of around 2.9 bps relative to peers. However, the coefficient more than doubles to 5.87 when we consider HY corporate bonds in column (3), with *t*-statistic in excess of 7, suggesting that the silent swing pricing behavior of active bond funds is particularly pronounced among HY bonds. This finding is consistent with HY having greater pricing discretion which enables funds to silent-swing these valuations to a greater extent compared with their IG bond holdings.

In contrast with active bond funds, whose open-end structure necessitates liquidity provision by fund management companies to investors through frequent trading of the underlying securities, liquidity provision considerations of ETF management companies are arguably less severe, since the market price of ETFs can temporarily adjust relative to its NAVs, e.g., in response to abnormal flows. While it is still in the interests of management companies and authorized participants to reasonably manage the level of the ETF trading premium, the management companies' need to engage in silent swing pricing for ETFs is less acute because they redeem in-kind to the authorized participants in the form of a representative basket of underlying securities.[6] To examine whether ETFs indeed differ from active funds in the extent of silent swing pricing, we pool together the fund-bond-month-level holdings information of active bond funds as well as ETFs and interact all contemporaneous and past flows and returns with the *active fund* indicator, which takes the value of one for active bond funds. This allows us to examine how much active bond funds engage in silent swing pricing relative to ETFs, where the ETFs holding the same bonds effectively act as a control group for the active funds.

Table 2 Panel B presents the results. The coefficient on the same-day flow, which corresponds to the silent-swing coefficient for the sample of ETFs only, is insignificant for all corporate bonds and IG corporate bonds in columns (1) and (2), respectively. We find weak evidence of ETFs engaging in

[6] Though some open-end funds also reserve the right to redeem in-kind, as shown to be the case in Agarwal, Ren, Shen, and Zhao (2023), this is not as commonplace as ETFs, where the exchange of the basket of underlying securities between the management companies and authorized participants in return for the right to create or redeem shares occurs on a daily basis.

silent swing pricing to some degree among HY corporate bonds, with the coefficient on the same-day flow term of 1.71 exhibiting marginal statistical significance at the 10% level. Most importantly, across all three columns, we find the interaction of the same-day flow and the active fund indicator to be positive with statistical significance either at the 1% or 5% levels. Thus, the tendency to engage in silent swing pricing appears much weaker among ETFs compared to their active bond fund counterparts.

In Table A.2 in the Appendix, we examine whether funds engage in this type of silent swing pricing among other types of bonds. We find little evidence of silent swing pricing among active bond funds for Treasury bonds or other types of bonds. However, similar to our findings for corporate bonds, we find that the coefficient on the same-day flow term is positive with substantial economic and statistical significance for municipal bonds, regardless of whether we focus solely on active bond funds or when their pricing response is examined relative to their ETF counterpart.[7] This finding is consistent with both corporate and municipal bonds being relatively more illiquid compared to Treasury bonds.

To support the robustness of these baseline findings, we report similar results on the extent of silent swing pricing when we consider alternative control variables or fixed effect specifications. Specifically, we consider (i) the addition of day 0 fund return as an addition control,[8] (ii) the exclusion of all past return terms from the set of controls, and (iii) without the inclusion of bond-by-month fixed effect, as shown in detail in Table A.4 in the Appendix. In Table A.5 in the Appendix, we estimate regressions for the sample of active funds and ETFs, similar to Table 2 Panel B, but where we additionally include of benchmark-by-bond-by-month fixed effects. This allows us to compare the

[7] We find all results to be fully consistent when we examine ETFs separately without pooling the sample with active bond funds, as shown in Table A.3 in the Appendix.

[8] The coefficient on the return on day zero is notably highly significant. This is possibly because of a mechanical correlation with the reported price deviation, as a higher price deviation for the bonds in a fund's portfolio may *cause* a high return on that day. We therefore do not include this control variable in any of our other specifications.

extent of silent swing pricing by active funds relative to that of ETFs that share the same primary benchmark index. We find fully consistent results: Active mutual funds exhibit substantially greater willingness to engage in silent swing pricing compared to their ETF counterparts that use the same benchmark. Finally, in Table A.6 in the Appendix, we divide our bonds into three time-to-maturity baskets (less than five years, five to ten years, and more than ten years) and run subsample regressions to confirm that this silent swing pricing behavior is observed across all three baskets.[9]

3.2. Does the Silent Swing Pricing Respond Stronger to Outflows?

It is well known that the open-end structure of bond funds give rise to first-mover advantage associated with strategic complementarity (e.g., Goldstein, Jiang, and Ng, 2017; Falato, Goldstein, and Hortaçsu, 2021). Given that investor outflows may exacerbate the flow fragility, bond funds may have greater incentive to engage in silent swing pricing when faced with investor outflows, aggressively marking down their corporate bond holdings to alleviate such strategic complementarity. Thus, in this subsection, we examine whether the extent of funds' silent swing pricing differs depending on whether they face inflows or outflows. Specifically, we divide both the same-day flow as well as all past flow and return terms into their piecewise nonnegative and negative components and re-estimate the baseline regressions. Our key variables of interest are the non-negative and negative components of the same-day flow, which enables us to analyze whether the silent swing pricing is stronger in economic and statistical significance following outflows.

TABLE 3 HERE

Table 3 presents our results, with column (1) presenting the result for all corporate bonds and columns (2) and (3) separately for IG and HY corporate bonds, respectively. Across all three

[9] Finally, in untabulated analysis, we find that our baseline results remain qualitatively robust at the 5% level for HY bonds even if we include fund fixed effect as an additional fixed effect.

columns, we find that the coefficient on the same-day flow is statistically significant at the 1% level only when the fund faces negative flows on a given day. In contrast, this relation is weaker and not statistically significant when the fund has positive flows. For example, in column (1), the non-negative component of the same-day flow is insignificant with a point estimate of 1.89, while the point estimate for its negative counterpart increases almost by fivefold to 8.90, with a *t*-statistic in excess of 4.

The results for HY corporate bonds in column (3) are particularly eye-catching, with the point estimate on the negative component of the same-day flow rising to 12.23, implying a price mark-down of over 12 bps following a 1% outflow. We further test the coefficient *difference* between nonnegative and negative piecewise components of the same-day flow and find these to be statistically significant at the 5% level for the sample of all bonds and in the sample of HY bonds, with F-statistics of 5.56 and 4.71, respectively.

The evidence in Table 3 thus strongly indicates that the silent swing pricing of corporate bonds by active bond funds is almost entirely in response to investor outflows, with little evidence of silent swing pricing in response to inflows. This is consistent with fund management companies' incentives to alleviate the inherent strategic complementarity stemming from the liquidity mismatch of open-end bond funds.

3.3. Has the SEC's Swing Pricing Rule Changed Funds' Pricing Behaviors?

One of the most prominent regulatory changes regarding swing pricing during our sample period is the decision by the Securities and Exchange Commission (SEC) to amend Rule 22c-1 under the Investment Company Act to permit management companies of open-end funds to engage in swing pricing from November 19, 2018. This has, in turn, enabled management companies to adjust the NAVs of their open-end funds by a predetermined "swing factor" not exceeding 2% of the NAV if investor flows exceed the "swing threshold."

Even though no U.S. funds have decided to implement swing pricing since the rule change, its impact on the funds' willingness to engage in silent swing pricing through bond-level valuation is unclear. On the one hand, increased attention on and concern for buy-and-hold investors' dilution resulting from the industry-wide discussion of the swing pricing rule may have encouraged management companies to be more proactive in implementing silent swing pricing. Such increased awareness could increase the extent of silent swing pricing. On the other hand, if management companies view the adoption of swing pricing (in the legally authorized form) as a substitute for silent swing pricing, the extent of the latter behavior may become more subdued following the regulatory change. Finally, if management companies remain content with their own current arrangements for bond pricing, the SEC's decision to permit *explicit* swing pricing may have little impact on fund behavior. In this subsection, we explore this by interacting day 0 flow with a *post-swing-pricing* indicator, which takes the value of one for all observations from November 2018 onward.[10] Due to the inclusion of bond-by-month and Lipper-objective-by-month fixed effects, the standalone post-swing-pricing indicator is subsumed by these fixed effects.

TABLE 4 HERE

Table 4 Panel A presents the results. Regardless of whether we examine all, IG, or HY bonds, we find the interaction of the same-day flow and the post-swing-pricing indicator to be insignificant in all instances, suggesting little change in the degree of observed silent swing pricing behavior before and after the introduction of the SEC's swing pricing rule in November 2018. We also observe that the coefficient on the same-day flow, which is the baseline coefficient for the period *prior* to the SEC's implementation of the swing pricing rule, is significant at the 1% level across all three panels, suggesting that funds may have already been implementing a form of silent swing pricing prior to this

[10] We equivalently interact all of the past flow and return terms with the post-swing-pricing indicator.

rule. In fact, the point estimate for the coefficient on the interaction term is negative across all three columns, suggesting that the degree of silent swing pricing may, if anything, have been stronger in the years prior to the rule change.

In Table 4 Panel B, we examine whether there has been a systematic change in the asymmetry of the degree of silent swing pricing for inflows vs. outflows by separating all flow and return terms into their nonnegative and negative components and interacting each with the post-swing-pricing indicator. Once again, we do not find a significant change in fund behavior following the implementation of the swing pricing rule, with the interaction term having a negative sign with marginal statistical significance at the 10% level for day 0 inflows among IG corporate bonds and without statistical significance in all other instances. In sum, the evidence in Table 4 suggests little change in management companies' appetite for silent swing pricing in response to the SEC's swing pricing implementation, which in turn may partly explain their reluctance to adopt explicit swing pricing after November 2018 despite being permitted to do so.

3.4. Does the Fund Mandate Matter for Silent Swing Pricing?

Our empirical analysis hitherto separately examines IG and HY segments on the basis of the bonds' credit ratings. However, given that the mandates of active bond funds usually specify whether a given fund should specialize in IG- or HY-rated bonds, we alternatively also examine whether the degree of silent swing pricing differs on the basis of fund mandate. To examine this possibility, we separate all general and corporate active bond funds into IG and HY mandate funds according to their Lipper objective code as in Choi, Kronlund, and Oh (2022) and interact the baseline regressions with the mutually exclusive IG and HY mandate indicators. Due to the inclusion of the Lipper-objective-by-month fixed effect, the standalone IG or HY mandate indicator is subsumed by the fixed effect.

We report the results in Table A.7 in the Internet Appendix. In Panel A, we find the point estimate of the interaction term of the same-day flow and the HY mandate indicator to be somewhat larger than that of the IG mandate counterpart, with stronger statistical significance. However, we do not find the coefficient difference between the two to be statistically significant. In Panel B, we separate all flow and return terms into nonnegative vs. negative components and interact each term with the two mutually exclusive fund mandate indicators. We find that the coefficient on the inflow part of the same-day flow is not statistically significant, while the coefficient on the outflow part is. The magnitude of the coefficient difference between the negative vs. nonnegative component of the same-day flow is much larger for HY mandate funds (12.093 – 0.098 = 11.995) than for IG mandate funds (6.402 – 3.210 = 3.192), with only the former being statistically significant at the 10% level. Thus, HY-mandate funds exhibit much stronger tendency to engage in silent swing pricing in response to outflows than their IG mandate peers, which is not surprising as their underlying securities, on average, are substantially less liquid. Overall, the evidence suggests that the liquidity of underlying securities seems to be an important driver of how far funds are willing to mark their prices up or down in response to investor flow, an issue which we investigate in more detail in the subsequent section.

4. What Drives the Extent of Silent Swing Pricing?

The previous section reveals that active bond funds mark their corporate bond holdings up or down in response to investor flows, which constitutes a form of swing pricing that's implemented "bottom-up" by adjusting the prices of bonds rather than adjusting the fund-level NAV. This result is particularly pronounced for HY corporate bonds and when funds face investor outflows. These findings hint at an important role that is played by the liquidity and trading characteristics of underlying securities within a fund's portfolio. In this section, we first analyze whether the degree of silent swing pricing differs when the underlying corporate bonds are more illiquid. Our hypothesis is that more illiquid bonds should exhibit a greater extent of silent swing pricing, both because of the expanded use of discretion when valuing these bonds, and because of the greater flow-based externalities that these types of illiquid bonds engender. We similarly examine whether the funds' silent swing pricing behavior is more prominent when there is no traded price for a bond and explore further into the management companies' bond pricing relative to traded prices reported on TRACE.

We next study whether a fund's longer-run returns have a moderating effect on silent swing pricing. This analysis helps shed more light on the role of funds' return smoothing incentives. We then estimate the aggregate degree of silent swing pricing at the overall portfolio level (instead of at the level of each bond). We further compare these portfolio-level magnitudes to the sensitivity of how ETFs' trading premium responds to their contemporaneous flows. Finally, we shed light on whether a fund's decision to engage in silent swing pricing predicts its subsequent flows and flow volatilities.

4.1. Does the Illiquidity of Underlying Securities Strengthen Silent Swing Pricing?

We first explore whether the illiquidity of underlying securities drives the degree to which a bond fund engages in silent swing pricing. To measure the illiquidity of underlying securities, we compute the monthly Amihud measure, namely the average value of daily absolute return divided by the daily trading volume. We use only institutional trades in excess of $100,000 to calculate daily price, either using the volume-weighted average price (VWAP) or last traded price of the trading day.[11] We then interact this bond-level Amihud illiquidity measure with all flow and return terms in the baseline regressions. Due to the inclusion of bond-by-month fixed effect, the standalone illiquidity measure is subsumed by the fixed effects.

TABLE 5 HERE

[11] Though we use the one-month Amihud illiquidity measured at the previous month-end for the baseline analysis, we confirm in untabulated analysis that qualitative results remain unchanged if we use three- or six-month Amihud measure instead. Similarly, results remain unchanged if we use log inverse trading volume as an alternative measure of illiquidity.

Table 5 presents the results. Regardless of how the Amihud illiquidity measure is constructed, and regardless of whether we consider all, IG, or HY corporate bonds, we find that the interaction of the same-day flow and the Amihud illiquidity measure is significant at the 5% level in all instances. In terms of economic magnitude, the point estimate on the interaction term in column (1) implies that a one-standard-deviation increase in the illiquidity of the underlying corporate bond increases the sensitivity of fund pricing to investor flow by $0.170 \times 4.494 = 0.76$ bps. Interestingly, we find the coefficient on the interaction of the same-day flow and the Amihud illiquidity measure to be larger for IG corporate bonds than their HY counterparts, suggesting that the management companies' concern for bond-level illiquidity is not exclusively confined to the illiquid HY corporate bond segment. One way to interpret this result is that, even though IG bonds on average are more liquid than HY bonds, there exists a more significant degree of variation across bonds in their level of liquidity among IG bonds than for HY bonds.

In Table A.8 in the Appendix, we run similar regressions with bond return volatility as the interaction variable instead of the Amihud illiquidity measure. Once again, we find that the degree of silent swing pricing by management companies increases as the return volatility of the corporate bond increases, highlighting the important role of the illiquidity of underlying holdings.[12]

4.2. Does the Availability of Traded Prices Matter for Silent Swing Pricing?

The secondary market for corporate bonds is characterized by a high prevalence of days with no trading (e.g., Edwards, Harris, and Piwowar, 2007; Dick-Nielsen, Feldhütter, and Lando, 2012; Goldstein and Hotchkiss, 2020; Choi, Huh, and Shin, 2024). A bond then may not have a readily

[12] Furthermore, we compute the holding-weighted fund-level Amihud illiquidity measure in untabulated analysis and interact it with the flow and return terms instead; we find consistent results but with weaker statistical significance, suggesting that the bond-level illiquidity appears to be a more important consideration when it comes to the pricing sensitivity to investor flows.

available traded price at a given month-end due to the sheer lack of trading. In addition to the fact that the lack of available traded prices indicates a high degree of illiquidity, this would also increase the amount of discretion that management companies can exercise when valuing the security. Traded prices are an important input into the fair value measurement hierarchy.[13] Still, we find that funds often report valuations even outside the range of traded prices from TRACE.[14]

Whereas it would be difficult to depart substantially from traded prices when they are well-established, the "room" to engage in silent swing pricing is likely larger for securities without such traded prices. To this end, we construct a *no traded price* indicator, which takes the value of one if a bond does not have any institutional trade on the last trading day of the month, and interact it with all the flow and return terms in the baseline regressions.[15]

TABLE 6 HERE

Table 6 presents the results. For the entire sample of corporate bonds in column (1), we find the interaction between the same-day flow and the no traded price indicator to be significantly positive at the 5% level. The point estimates imply that, following a 1% investor flow on the last trading day of the month, a corporate bond with a traded price available on TRACE is marked up relative to peers by 3.67 bps, while a comparable corporate bond without a traded price is marked up by 3.67 + 1.61 = 5.28 bps. When we consider IG and HY corporate bonds separately in columns (2) and (3), we find the interaction of the same-day flow and the no traded price indicator to be significant only for the

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13 The transaction prices reported in TRACE are an example of a "significant observable market input" (ASC 820, IFRS 13) that can be used to value Level 2 securities within the fair value hierarchy, to which most corporate bonds belong.

14 In Table A.9, we report statistics showing that only around a half (50.8%) of the reported price of active bond funds fall within the TRACE price range at any given month-end. 29.0% are reported as below the minimum, while the remaining 20.1% of price observations are marked above the maximum. The fact that nearly a half of the reported prices fall outside of the TRACE price range strongly indicates that funds retain a substantial degree of subjective judgement when it comes to valuing a corporate bond. Furthermore, the fact that the reported price is more likely to be below the minimum of the traded price range than above the maximum may partly stem from the fact that funds usually adopt bid pricing or mid pricing (i.e., the average of bid and ask prices) but it is rare to observe ask pricing. Using the data from fund prospectuses, Cici, Gibson, and Merrick (2011) classify around 35% of their sample funds as bid markers, with another 28% using the average of bid and ask prices and 32% maintaining a degree of pricing ambiguity.

15 In untabulated analysis, we confirm that results remain qualitatively robust if we require an absence of institutional trade during the last five trading days of the month instead.

HY-rated bonds. This is not surprising as many IG-rated bonds have readily available quotes from broker-dealers even if an actual trade does not take place, reducing the amount of discretion that may be exerted in valuing the securities. In contrast, we find the lack of available traded price to matter more for HY-rated bonds, where the broker-dealer coverage is sparse and the room for discretion is therefore likely to be larger.

In addition to the analysis at the individual fund level, we further examine whether the valuation of the aggregate fund sector, as a whole, reacts positively to investor flows, which would amount to "silent swing pricing" at the aggregate level. To this end, we aggregate fund flows and run regressions with the percentage of fund price observations that are either (i) below the minimum TRACE traded price or (ii) above the maximum TRACE traded price as the dependent variable in Table A.10 in the Appendix. An interesting picture emerges; poor investor flows raise the percentage of funds marking their bond valuations above the maximum TRACE traded price and reduce the likelihood of funds lowering their bond valuation below the minimum TRACE traded price, particularly for IG bonds, which is not consistent with the predictions of silent swing pricing at the aggregate level. Instead, the behavior of the aggregate fund sector more likely reflects return smoothing behavior. Put differently, funds appear to engage in silent swing pricing relative to other funds, but the fund sector, in aggregate, appears to exhibit tendency toward return smoothing. This reveals conflicting incentives for the funds in terms of swing pricing versus return smoothing, an issue which we examine in more detail in the subsequent subsection.

4.3. Does Poor Recent Fund Performance Weaken Silent Swing Pricing?

Our analysis of fund pricing relative to the TRACE price range in the previous subsection reveals that, in addition to the incentives to engage in swing pricing, particularly when the underlying security is illiquid and the fund faces outflows, there exists a competing force, namely the incentives for return smoothing. This return smoothing incentive would arguably be greater for funds with poor recent performance relative to their peers, as such funds with poor returns may suffer a lack of confidence from investors and thus be more worried about their short-run performance. If silent swing pricing contributes toward increased volatility of fund returns, these funds would be more reluctant to engage in aggressive silent swing pricing.

We examine whether this is indeed the case by creating quantile indicators on the basis of recent fund performance. Specifically, we create indicators for the bottom 30% (*low*), middle 40% (*mid*), and top 30% (*high*) of recent fund performance relative to a fund's Lipper objective peers at the previous month-end. As measure of recent fund performance, we consider three-month, six-month, and year-to-date returns. We then interact these mutually exclusive performance quantile indicators with all flow and return terms in the baseline regressions.

TABLE 7 HERE

Table 7 Panel A presents the results. Regardless of whether we analyze the full sample of corporate bonds or the rating-based subsamples, and across all fund performance horizons, we find that the interaction of the same-day flow and the low return indicator lacks statistical significance in all instances. This is in contrast to the interaction of the same-day flow and the mid return indicator, for example, which is always positive and statistically significant at the 5% level across all columns. The results thus indicate that funds with poor recent performance relative to their Lipper objective peers exhibit reluctance to engage in silent swing pricing. In contrast, for the full sample as well as HY corporate bonds, we find the interaction of the same-day flow and the mid or high return indicator to be statistically significant. In particular, funds belonging to the middle 40% of recent performance tend to exhibit most pronounced silent swing pricing behavior, further hinting at the important role of funds' return smoothing incentives as a countervailing force against silent swing pricing.

We further divide all flow and return terms into their non-negative and negative components and interact each term with the performance quantile indicators. Once again, Table 7 Panel B reveals an important role of the recent fund performance in driving the sensitivity of silent swing pricing. When we focus on HY corporate bonds, for example, we find that mid- and high-performance funds proactively engage in swing pricing following investor outflows. In contrast, the interaction of same-day outflow and the low return indicator lacks statistical significance in across all fund performance measures. For HY corporate bonds, there appears to exist a pecking order in the degree of silent swing pricing which depends on a fund's recent performance. Furthermore, across all corporate bond subsamples and fund performance horizons, we find the silent swing pricing behavior of funds with their recent performance within the middle 40% of their Lipper objective peers to be most consistently significant. The evidence in Table 7 thus reveals that recent fund performance is an important driver of the extent of the silent swing pricing behavior, with poorly performing funds unwilling to mark their prices up or down aggressively in response to investor flows.

4.4. Variation in Silent Swing Pricing Across Fund and Family Characteristics

In Table A.11 in the Appendix, we examine whether other fund or portfolio characteristics affect the sensitivity of the funds' reported price deviation to investor flows. First, we consider how much of a fund's assets are held in share classes with load fees. These load fees act as a deterrent to opportunistic flows and may thus be viewed as a substitute for silent swing pricing. Consistent with this prediction, we find that the interaction of the same-day flow and TNA-share of load fee class is significantly negative among HY corporate bonds.

Second, across all corporate bond subsamples, we find the interaction of the same-day flow and fund age to be significantly positive, suggesting that funds engage in more proactive silent swing pricing as they become older. This may be attributable to the fact that newly launched funds have a greater need to establish a track record, which may in turn weaken their silent swing pricing incentives in favor of return smoothing.

Third, we find the interaction of the same-day flow and portfolio cash holdings to be significantly positive, particularly among IG corporate bonds. This result is in line with our earlier findings on the illiquidity of underlying securities when considering that funds investing in illiquid mandates tend to hold more cash (Chernenko and Sunderam, 2016; Morris, Shim, and Shin, 2017). Theoretically, all else equal, more cash should mean fewer flow externalities, thus alleviating funds' incentives to engage in silent swing pricing; but funds may choose to hold more cash in the first place when their investment mandate is illiquid so that they worry about such externalities. The fact that we observe portfolio cash holdings to be positively related to silent swing pricing is thus more consistent with the latter mechanism.

In addition to the fund-level incentives, we examine whether family-level incentives matter for the extent of silent swing pricing. To this end, in Table A.12 in the Appendix, we interact the same-day flow with the fund family's market share in the bond fund market, either across (i) all open-end funds and ETFs or (ii) solely among open-end funds. We find statistically significant evidence of funds belonging to larger families exhibiting greater willingness to engage in swing pricing. In sum, the evidence documented in Tables A.11 and A.12 suggest that funds with more stable investor base, i.e., those that have a sufficiently long track record and belong to families commanding larger market share, exhibit stronger silent swing pricing tendencies.

4.6. Silent Swing Pricing at the Portfolio Level

Until now, we examined the degree of silent swing pricing for each fund-bond pair. We now proceed to examine the extent of silent swing pricing at the aggregate portfolio level. To this end, we create a holding-weighted-average reported price deviation relative to peers at the aggregate portfolio level for each fund-month. We then run regressions with the same-day flow as well as past flow and return terms as in the baseline regressions, with the addition of following fund characteristics measured at previous month-end as controls: log fund size, fund age, expense ratio, turnover, TNA-share of institutional classes, and TNA-share of load fee classes. In addition, we include Lipper-objective-by-month fixed effect. This specification enables us to gauge the economic magnitude of silent swing pricing at the aggregate fund (portfolio) level.

TABLE 8 HERE

The point estimate on the same-day flow in column (1) of Table 8 Panel A implies that, following a 1% investor flow on the last trading day of the month, the fund, on average, marks up its corporate bond holdings by 1.54 bps relative to its peers, which is also statistically significant at the 5% level. For funds holding HY corporate bonds, we find an even larger point estimate of 1.88, which is once again statistically significant at the 5% level. In addition to the same-day flow, we find the point estimates on past returns to be significantly negative, which suggests that, in addition to silent swing pricing, corporate bond valuation may be reflecting some degree of return smoothing. It is worth noting that the observed point estimates for the same-day flow is smaller than those obtained at the fund-bond-month level in Table 2; this is not surprising as the silent swing pricing behavior is stronger among bonds that are less liquid which in turn tend to have slightly lower portfolio weights.

We further divide all flow and return terms into their nonnegative and negative components and repeat the analysis in Table 8 Panel B. Consistent with Table 3, we find little evidence of silent swing pricing on the upside, with the point estimates lacking statistical significance across all three columns. The silent swing pricing behavior thus primarily appears to be a response to investor outflows, with the point estimate of the piecewise negative component of the same-day flow positive and significant at the 5% level across all three columns. In terms of economic magnitude, the results in column (1) indicate that, following a 1% investor outflow, the fund marks down its corporate bond holdings by almost 4 bps.

For a further discussion of the economic magnitude of silent swing pricing, we require a benchmark for comparison. To this end, we turn to a comparison with the ETF trading premium. The proportional difference between an ETF's traded price and its NAV can be interpreted as the liquidity premium that a buyer or a seller has to pay in a market exchange. Thus, how the ETF trading premium responds to the same-day ETF flow reveals the degree of "swing pricing" caused by market participants instead of by management companies. With this in mind, we re-run the analyses in Table 8 with the ETF trading premium as the dependent variable.

TABLE 9 HERE

Table 9 Panel A presents the baseline results. In column (1), we find that a 1% inflow into an ETF increases the ETF trading premium by 3.62 bps. When we separate IG and HY mandate ETFs in columns (2) and (3), the corresponding figure becomes 2.22 bps and 5.36 bps, respectively. In all three instances, the statistical significance is either at the 1% or 5% levels. The observed coefficient for the full sample suggests that the economic magnitude of "silent swing pricing" implemented by active bond funds is approximately 40% of the "swing pricing" by caused ETF market participants through their market impact.

We then separate the same-day flow into its nonnegative and negative components and estimate the economic magnitude of ETF market participants' "swing pricing" separately for inflows and outflows. In this analysis, we find that the swing pricing induced by market participants' flows for ETFs is noticeably more symmetric than that for active mutual funds' NAV. Although the point estimates are larger for same-day outflows compared to inflows in all instances, their difference does not turn out to be statistically significant, and more importantly, the coefficient on the same-day inflows are statistically significant across all three columns at the 5% level. Consequently, whereas the economic magnitude of silent swing pricing by active bond funds is close to 80% of the ETF market participants' swing pricing following investor outflows, the difference in the extent of (silent) swing pricing is stark following investor inflows. In contrast to management companies, whose pricing response to investor inflows is statistically indistinguishable from zero, a 1% inflow into a bond ETF triggers an increase in ETF trading premium by 3.27 bps.

4.7. Does It Pay to Engage in Silent Swing Pricing?

In the final set of our analysis, we explore whether it is in the funds' interest to engage in silent swing pricing. To answer this question, we first identify funds with high degrees of silent swing pricing. Specifically, at the fund portfolio level, we run a fund-by-fund regression of a fund's holding-weighted-average reported price deviation on investor flows for days 0, -1, [-5: -2], [-10: -6], and [-20: -11] over the previous 36-month window. The coefficient on day 0 is the fund-level "silent swing" coefficient. We then divide our sample of active bond funds into two equal-sized subsamples based on whether their silent swing coefficient is above or below the median silent swing coefficient for their Lipper objective peers, which in turn enables us to construct the *swing fund* indicator. We then run regressions at the fund-month level with the subsequent (i) 1-day, (ii) 1-week, or (iii) 1-month flow as well as the daily flow volatility over the next month as the dependent variable. This analysis thus asks whether funds engaging in silent swing pricing are viewed favorably by the investors as measured by future inflows and/or a stable level of future flows.

TABLE 10 HERE

Table 10 Panel A presents our baseline results. We find little evidence of silent swing pricing either helping or harming the fund in terms of subsequent flows and flow volatility, with all coefficients on the swing fund indicator lacking statistical significance. However, an interesting picture emerges when we interact the swing fund indicator with the mutually exclusive indicator variables denoting whether the same-day flow is positive or negative in Panel B. When a fund engages in more aggressive silent swing pricing relative to its same-style peers in response to the same-day inflow, it has a negative impact on the subsequent 1-day or 1-week flow, with statistical significance at the 5% level. In addition, the annualized next-month flow volatility also increases by 0.55%, with statistical significance at the 1% level. In contrast, when silent swing pricing is strongly implemented in response to a same-day outflow, a fund receives extra flow of 0.04% over the following week, which accumulates to 0.19% extra flow over the following month. In both instances, we observe statistical significance at the 5% level. Furthermore, while lacking in statistical significance, the point estimate on the next-month flow volatility regression in column (4) is negative. The evidence in Table 10 suggests that silent swing pricing may work in the interest of funds, but only when it is implemented in response to investor outflows. The observed patterns in Table 10 helps us understand why active bond funds make use of silent swing pricing in a highly asymmetric manner, and why the practitioners have been calling for the flexibility to respond to inflows and outflows differently.[16]

5. Conclusion

In this paper, we show mutual funds tilt the valuation of bonds in their portfolio in the same direction as their daily flows, consistent with funds engaging in "silent swing pricing." We further show this behavior is highly asymmetrical: While funds exhibit pronounced silent swing pricing behavior in response to investor outflows, we find little evidence of silent swing pricing in response to inflows. The (il)liquidity of a fund's underlying securities is also an important driver of silent swing

[16] Industry practitioners have argued for the need to set an asymmetric swing threshold when the SEC released its swing pricing proposal. See, for example, the excerpts from comments by Dechert and BlackRock in footnotes 163 and 164 of SEC Release No. 33-10234, with Dechert arguing for the need to permit funds to "apply swing pricing to net *redemptions* only, as opposed to applying it equally to net redemptions and net purchases (p. 49)."

pricing behavior, as we find noticeably stronger sensitivities of reported bond price deviations to the fund's same-day flows for illiquid, high-yield corporate bonds.

We further find evidence that funds face competing incentives when considering whether to implement such silent swing pricing. In particular, we identify that some funds engage in return smoothing behavior by tilting valuations in the opposite direction in response to past flows, which thus attenuates the extent of silent swing pricing among funds with poor past performance and a more fragile investor base, such as younger funds or funds belonging to smaller management companies. Overall, the level of silent swing pricing that we observe across our full sample is noticeably smaller than the average swings of 33 bps reported in Jin, Kacperczyk, Kahraman, and Suntheim (2022), whose sample consists of U.K. funds that formally adopted swing pricing. Yet, we find evidence of silent swing pricing working in favor of attracting subsequent flows and stabilizing flow volatilities when implemented in response to outflows but not in response to inflows, which may explain the strong asymmetry in fund's implementation of silent swings. This highlights the need for further discussion to differentiate the effect of inflows and outflows in future regulatory amendments on the swing pricing rule.

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Appendix. Variable definitions

In this appendix, we explain in detail how each variable used in our analysis is constructed, with the data source in parentheses.

A.1. Fund-bond-month variables

Reported price deviation (*Morningstar*): The difference between a fund's reported price for a security and the median reported price of all bond funds and ETFs holding the same security at the same month-end, divided by the median reported price. We consider a reported price to be valid if it is between 50 and 200. We require a minimum of three valid reported prices to construct the median.

A.2. Fund-month variables

Daily flow (*Morningstar*): Daily dollar flow of a fund divided by the previous trading-day TNA as reported in Morningstar. We aggregate all dollar flows and TNAs of individual share classes sharing the same Morningstar fund identifier (*fundid*) to arrive at a fund-level measure.

Daily return (*CRSP MF*): Daily fund return, namely a weighted-average daily return of all share classes belonging to the same CRSP fund identifier (*crsp_cl_grp*) with the previous trading-day TNA of each share class as the weight.

Total net assets (TNA) (*Morningstar*/*CRSP MF*): The aggregate TNA of all share class TNAs in a given day or month-end. We use the Morningstar data for the daily TNA and CRSP MF for the monthly TNA measure.

Expense ratio (*CRSP MF*): Weighted-average expense ratio (*exp_ratio*) of all share classes belonging to the same CRSP fund identifier.

Turnover (*CRSP MF*): Fund turnover (*turn_ratio*) as reported in CRSP MF.

Fund age (*CRSP MF*): The maximum age of a share class belonging to the same CRSP fund identifier.

Institutional class TNA-share (*CRSP MF*): The share of institutional class TNAs within a fund's TNA. Institutional classes are identified using the CRSP identifier *inst_f_d*.

Load fee TNA-share (*CRSP MF*): The TNA-share of share classes that charge a load fee within a fund's TNA. We consider a share class to be a load fee class if it charges nonzero front load fee for an investment of $1 million, or if it charges nonzero rear load fee.

IG/HY mandate funds (*CRSP MF*): We classify all general and corporate bond funds, defined as those with the first two characters of the CRSP objective code (*crsp_obj_cd*) "I" or "IC", into IG and HY mandate on the basis of their Lipper objective codes (*lipper_obj_cd*). We consider a fund to be a HY mandate fund if its Lipper objective code is either "ARB", "HY", "GB", "FLX", "MSI", "SFI", or "SHY", with the remaining funds classified as IG mandate funds.

A.3. Bond-month variables

IG/HY bond (*Mergent FISD*): Bonds rated above (below) the BBB-/BB+ boundary. For bonds with three credit ratings, we take the median, while for bonds with two credit ratings, we take the lower of the two.

Amihud illiquidity (*Enhanced TRACE*): Monthly average of daily absolute return divided by daily trading volume. To construct returns, we use either the volume-weighted average price or the last traded price of institutional trades exceeding $100,000 to calculate a bond's daily price. Daily trading volume is the sum of the par value of all institutional trades.

No traded price indicator (*Enhanced TRACE*): An indicator that takes the value of one if the bond does not have a price from an institutional trade on the last trading day of the month.

Table 1. Summary statistics

This table provides summary statistics of key variables. The sample period is July 2008 through December 2022. At the fund-bond-month level, we present summary statistics for the percentage deviation of active fixed income funds' reported price compared to the median of its peers' valuations of the same bond at the same point in time. We further present these statistics separately across bond sub-categories (IG corporate bonds, HY corporate bonds, municipal bonds, treasury bonds, and others). At the fund-month level, for all active fixed income funds holding at least one corporate bond within our sample, we report various fund-level characteristics. Finally, for the sample of corporate bonds, we report bond-month level summary statistics on trading-related variables. All continuous variables are winsorized at the 1% and 99% levels, and summary statistics are computed using winsorized values.

	No. of obs.	Mean	St. Dev.	P1	P25	P50	P75	P99
Fund-bond-month characteristics								
Reported price deviation (%)								
Corporate bonds	11,147,420	0.019	0.715	-2.542	-0.079	0.000	0.092	2.657
IG bonds	6,406,099	0.003	0.584	-1.990	-0.063	0.000	0.066	2.054
HY bonds	4,741,321	0.040	0.861	-2.709	-0.127	0.000	0.179	2.657
Municipal bonds	6,334,868	-0.040	0.780	-2.709	-0.002	0.000	0.003	2.657
Treasury bonds	763,606	-0.034	0.756	-2.709	-0.025	0.000	0.023	2.657
All other bonds	4,970,684	-0.002	0.432	-1.678	-0.001	0.000	0.000	1.803
Fund-month characteristics								
Same-day flow (Flow [0]) (%)	52,787	0.047	0.336	-1.118	-0.065	0.023	0.137	1.386
Same-day return (Return [0]) (%)	52,787	0.184	0.253	-0.483	0.000	0.142	0.322	0.920
Total net assets ($ millions)	52,532	1,782.8	3,585.4	7.500	154.8	530.6	1,599.9	23,412.8
Expense ratio (%)	51,434	0.687	0.291	0.000	0.497	0.660	0.856	1.508
Turnover (%)	51,439	118.6	133.0	9.000	42.00	70.00	135.0	736.0
Fund age (in years)	52,534	16.48	10.74	0.446	7.551	15.67	23.54	48.14
Institutional class TNA-share (%)	52,534	58.53	38.13	0.000	19.02	69.09	95.36	100.0
Load fee class TNA-share (%)	52,534	13.77	29.50	0.000	0.000	0.000	8.874	100.0
Bond-month characteristics								
Amihud (VWAP)								
Corporate bonds	977,839	0.086	0.176	0.000	0.005	0.020	0.078	1.004
IG bonds	776,355	0.083	0.170	0.000	0.004	0.020	0.074	1.004
HY bonds	201,484	0.100	0.195	0.000	0.005	0.022	0.092	1.004
No traded price (indicator)								
Corporate bonds	1,407,223	0.465	0.499	0.000	0.000	0.000	1.000	1.000
IG bonds	1,019,151	0.412	0.492	0.000	0.000	0.000	1.000	1.000
HY bonds	388,072	0.604	0.489	0.000	0.000	0.000	1.000	1.000

Table 2. Fund flow and reported price deviation of corporate bonds

Panel A of this table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on fund flows over various intervals within a given month. Using the month-end holdings data of all active U.S. fixed income funds between July 2008 and December 2022, we calculate a fund's pricing deviation for a given bond-month as the difference between its reported price and the median reported price of all open-end funds and ETFs holding the same bond at the same month-end, divided by the median reported price. We require a minimum of three reported prices at any given month-end to calculate the median price, and we exclude all reported prices less than 50 or greater than 200 from the analysis. The cross-sectional unit of observation is each fund-bond pair. The main variable of interest is fund flow on the last trading day of the month, which we denote day 0. In addition, we control for previous fund flows and returns over the following non-overlapping trading day intervals: -1, [-5: -2], [-10: -6], and [-20: -11]. Panel B of this table then expands the sample to active fixed income funds as well as fixed income ETFs. We then interact fund flows and returns with the *active fund* indicator, which takes the value of one for active open-end funds. We interact all previous flows and returns with the active fund indicator, with the coefficients for previous flows, returns, and their interactions with the active fund indicator omitted for brevity. In column (1) of both panels, we consider all corporate bonds with U.S. CUSIPs and credit rating information available in Mergent FISD. In columns (2) and (3) of both panels, we separately consider investment grade (IG) and high yield (HY) bonds. For bonds with two credit ratings, we take the lower of the two, while for those with three credit ratings, we take the median value. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Pricing deviation of active bond funds

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	4.434***	2.887**	5.866***
	(3.94)	(2.26)	(7.30)
Flow [-1]	-3.335**	-1.935	-4.763***
	(-2.74)	(-1.22)	(-4.58)
Flow [-5: -2]	-0.519**	-0.378*	-0.563
	(-2.07)	(-1.74)	(-1.61)
Flow [-10: -6]	-0.616**	-0.001	-1.185***
	(-2.28)	(-0.00)	(-5.66)
Flow [-20: -11]	-0.351**	-0.114	-0.624***
	(-2.11)	(-1.01)	(-3.31)
Return [-1]	-7.528**	-7.716***	-7.489*
	(-2.45)	(-3.58)	(-1.77)
Return [-5: -2]	-6.426	-5.916**	-6.544
	(-1.48)	(-2.17)	(-0.90)
Return [-10: -6]	-5.149**	-2.958**	-7.969***
	(-2.38)	(-2.60)	(-2.94)
Return [-20: -11]	-2.812***	-1.410	-4.576***
	(-2.81)	(-1.05)	(-3.78)
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.472	0.517	0.463
No. of obs.	10,981,757	6,258,534	4,723,119

Panel B. Pricing deviation of active bond funds relative to bond ETFs

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	-0.636	-1.548	1.708*
	(-0.56)	(-1.59)	(1.75)
Flow [0] × Active fund	5.203***	4.867**	3.673***
	(3.41)	(2.70)	(3.10)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.473	0.485	0.479
No. of obs.	18,064,668	11,837,621	6,226,922

Table 3. Fund flow and reported price deviation: Nonnegative vs. negative flow components

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on fund flow, but with fund flow separated into nonnegative and negative components. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also separated into negative and nonnegative components as controls, whose coefficient values we omit for brevity. We further report F-statistics testing the hypothesis that the coefficients on the nonnegative vs. negative flow components are equal to each other. In column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0] × I(Flow [0] ≥ 0) [(a)]	1.888	1.642	1.835
	(1.12)	(0.90)	(0.85)
Flow [0] × I(Flow [0] < 0) [(b)]	8.900***	5.433***	12.230***
	(4.32)	(3.23)	(4.16)
H_0: (a) = (b) (F-statistic)	5.56**	2.89	4.71**
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.473	0.518	0.464
No. of obs.	10,981,757	6,258,534	4,723,119

Table 4. Fund flow and reported price deviation: The effect of swing pricing implementation

This table presents OLS regression results of a fund's corporate bond pricing deviation from the interaction of fund flow and a *post-swing-pricing* indicator, which takes the value of one for all observations after November 19, 2018, when the SEC permitted investment companies to engage in swing pricing. Due to the inclusion of bond-by-month and Lipper-objective-by-month fixed effects, the standalone indicator term is subsumed by the fixed effects. In Panel A, we interact fund flow and the post-swing-pricing indicator, while in Panel B, we separate fund flows and returns into their negative and nonnegative components. In column (1) of both panels, we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. In all instances, all previous flows, returns, and their nonnegative and negative components in Panel B are interacted with the post-swing pricing indicator. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline regressions

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	5.302***	3.966***	6.245***
	(3.36)	(2.95)	(3.54)
Flow [0] × Post-swing-pricing	-2.101	-2.500	-1.073
	(-0.84)	(-1.68)	(-0.25)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.472	0.517	0.464
No. of obs.	10,981,757	6,258,534	4,723,119

Panel B. Nonnegative vs. negative flows

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0] × I(Flow [0] ≥ 0)	3.026	4.251*	1.194
	(1.14)	(1.82)	(0.36)
Flow [0] × I(Flow [0] ≥ 0) × Post-swing-pricing	-2.855	-6.275*	1.400
	(-0.79)	(-1.77)	(0.45)
Flow [0] × I(Flow [0] < 0)	9.013***	4.316**	13.102***
	(3.01)	(2.45)	(6.65)
Flow [0] × I(Flow [0] < 0) × Post-swing-pricing	-0.153	2.461	-2.238
	(-0.03)	(0.72)	(-0.31)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.473	0.519	0.465
No. of obs.	10,981,757	6,258,534	4,723,119

Table 5. Fund flow, reported price deviation, and bond illiquidity

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and bond illiquidity measure. We consider the previous-month Amihud measure as the measure of bond illiquidity. We consider all institutional trades (defined as those with trading value greater than $100,000) as reported in TRACE to calculate the Amihud measure. In columns (1) through (3), daily returns are calculated using the value-weighted average price (VWAP) during a trading day, while in columns (4) through (6), we use the last traded price of the trading day. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also interacted with the bond illiquidity measure, whose coefficient values we omit for brevity. In columns (1) and (4), we consider all corporate bonds, while in columns (2)-(3) and (5)-(6), we separately consider IG and HY bonds. The cross-sectional unit of observation is each fund-bond pair. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Reported price deviation					
Daily return measured using:	VWAP			Last traded price		
	(1)	(2)	(3)	(4)	(5)	(6)
	All corporates	IG only	HY only	All corporates	IG only	HY only
Flow [0]	3.780***	2.871**	5.096***	3.776***	2.859**	5.106***
	(3.04)	(2.11)	(5.41)	(3.03)	(2.10)	(5.40)
Flow [0] × Amihud	4.494***	4.697**	3.559**	4.167***	4.476**	3.135**
	(2.87)	(2.39)	(2.49)	(2.86)	(2.47)	(2.36)
Controls	YES	YES	YES	YES	YES	YES
Bond-by-month FE	YES	YES	YES	YES	YES	YES
Lipper-by-month FE	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.486	0.527	0.459	0.486	0.527	0.459
No. of obs.	7,241,567	4,894,030	2,347,409	7,241,567	4,894,030	2,347,409

Table 6. Fund flow, reported price deviation, and traded price availability

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and an indicator denoting whether a TRACE traded price does not exist on the last trading day of the month, which we refer to as *no traded price*. We only consider institutional trades, defined as those with trading value greater than $100,000. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also interacted with *no traded price* indicator, whose coefficient values we omit for brevity. In each panel, in column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. The cross-sectional unit of observation is each fund-bond pair. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	3.669***	2.724*	4.982***
	(2.92)	(2.00)	(5.23)
Flow [0] × No traded price	1.614**	0.490	1.478*
	(2.37)	(0.79)	(1.92)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.472	0.517	0.463
No. of obs.	10,981,757	6,258,534	4,723,119

Table 7. Fund flow, reported price deviation, and recent fund performance

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and recent fund performance quantile indicators. Low, mid, and high fund return are defined as the bottom 30%, mid 40%, and top 30% of fund return over a specified performance horizon relative to Lipper objective peers at the same point in time. In Panel A, we interact fund flow with the quantile indicators, while in Panel B, we separate fund flows and returns into their nonnegative and negative components and interact with the quantile indicators. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] (and their nonnegative and negative components in Panel B) are also interacted with the quantile indicators in each instance, whose coefficient values we omit for brevity. In each panel, in column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. The cross-sectional unit of observation is each fund-bond pair. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline regressions

	Reported price deviation								
Performance horizon	3-month fund return			6-month fund return			Year-to-date fund return		
	(1) All bonds	(2) IG bonds	(3) HY bonds	(4) All bonds	(5) IG bonds	(6) HY bonds	(7) All bonds	(8) IG bonds	(9) HY bonds
Flow [0] × Low return	1.138	0.482	1.544	1.822	1.713	2.021	2.452	3.008	2.068
	(1.12)	(0.51)	(0.89)	(0.89)	(1.03)	(0.60)	(0.92)	(1.24)	(0.68)
Flow [0] × Mid return	6.319***	5.207**	7.266***	5.777***	4.677**	6.709***	6.289***	4.812**	7.461***
	(3.99)	(2.40)	(5.32)	(3.57)	(2.10)	(6.03)	(3.60)	(2.09)	(5.43)
Flow [0] × High return	3.858*	1.003	6.559***	4.095*	0.765	7.132***	3.121*	0.042	5.929***
	(2.01)	(0.82)	(3.93)	(1.94)	(0.64)	(3.93)	(2.00)	(0.04)	(4.89)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Bond-by-month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Lipper-by-month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.473	0.517	0.464	0.473	0.517	0.464	0.473	0.517	0.464
No. of obs.	10,932,307	6,232,862	4,699,340	10,895,129	6,208,210	4,686,813	10,942,298	6,238,630	4,703,563

Panel B. Nonnegative vs. negative flows

Performance horizon	Reported price deviation								
	3-month fund return			6-month fund return			Year-to-date fund return		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All bonds	IG bonds	HY bonds	All bonds	IG bonds	HY bonds	All bonds	IG bonds	HY bonds
Flow [0] × I(Flow [0] ≥ 0) × Low	-1.811	-3.614**	-0.753	-0.522	-3.017*	1.626	-1.694	-3.614*	-0.002
	(-0.99)	(-2.32)	(-0.37)	(-0.27)	(-1.71)	(0.42)	(-0.75)	(-1.84)	(-0.00)
Flow [0] × I(Flow [0] ≥ 0) × Mid	4.554*	3.748	5.260	1.957	2.898	0.657	4.307	3.857	4.270
	(1.80)	(1.60)	(1.57)	(0.78)	(1.03)	(0.18)	(1.57)	(1.41)	(1.12)
Flow [0] × I(Flow [0] ≥ 0) × High	0.737	2.563	-0.927	3.724*	2.467	5.066*	1.407	2.243	0.686
	(0.33)	(1.16)	(-0.31)	(1.75)	(1.22)	(1.83)	(0.64)	(1.05)	(0.27)
Flow [0] × I(Flow [0] < 0) × Low	5.627**	5.923**	5.304	5.119	7.147**	2.962	8.494	10.879**	5.931
	(2.16)	(2.65)	(1.10)	(1.46)	(2.74)	(0.57)	(1.61)	(2.28)	(1.03)
Flow [0] × I(Flow [0] < 0) × Mid	8.904***	7.383**	10.206**	10.981***	6.782***	14.848***	8.847***	6.779***	11.133**
	(3.21)	(2.42)	(2.43)	(4.39)	(3.58)	(3.88)	(3.20)	(3.21)	(2.61)
Flow [0] × I(Flow [0] < 0) × High	12.341**	1.459	21.693***	8.496*	0.831	14.549***	9.854	-1.842	19.270***
	(2.43)	(0.52)	(6.28)	(1.90)	(0.26)	(3.52)	(1.50)	(-0.48)	(4.43)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Bond-by-month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Lipper-by-month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.474	0.519	0.466	0.475	0.519	0.467	0.474	0.519	0.467
No. of obs.	10,932,307	6,232,862	4,699,340	10,895,129	6,208,210	4,686,813	10,942,298	6,238,630	4,703,563

Table 8. Fund flow and portfolio-level price deviation

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers at the portfolio level on fund flows. To construct the portfolio-level price deviation from peers, we take the holding-weighted average reported price deviation of (i) all corporate bonds, (ii) IG corporate bonds, and (iii) HY corporate bonds. The regressions are thus conducted at the fund-month level. In Panel A, we run regressions of portfolio-level price deviation on fund flows and returns over various horizons within a month, similar to Table 2. In Panel B, we separate all flows and returns into their nonnegative and negative components. In all specifications, we further control for fund characteristics at the previous month-end, namely log fund size, fund age, expense ratio, turnover, TNA-share of institutional classes, and TNA-share of load fee classes. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline regressions

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	1.536**	0.988*	1.876**
	(2.75)	(1.76)	(2.39)
Flow [-1]	-1.141	-1.236	-1.910**
	(-1.53)	(-1.55)	(-2.28)
Flow [-5: -2]	-0.378**	-0.340**	-0.474**
	(-2.29)	(-2.07)	(-2.83)
Flow [-10: -6]	-0.082	-0.027	-0.069
	(-0.51)	(-0.20)	(-0.33)
Flow [-20: -11]	0.030	0.073	0.021
	(0.42)	(1.25)	(0.19)
Return [-1]	-6.418**	-6.860**	-5.272**
	(-2.27)	(-2.35)	(-2.59)
Return [-5: -2]	-3.636**	-3.351*	-3.362
	(-2.07)	(-1.87)	(-1.70)
Return [-10: -6]	-2.779***	-2.237**	-2.401*
	(-3.04)	(-2.55)	(-2.00)
Return [-20: -11]	-0.755	-0.544	-2.188**
	(-1.53)	(-1.07)	(-2.67)
Controls	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.056	0.049	0.045
No. of obs.	56,141	54,531	42,925

Panel B. Nonnegative vs. negative flows

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0] × I(Flow [0] ≥ 0) [(a)]	0.173	0.259	0.783
	(0.22)	(0.35)	(0.74)
Flow [0] × I(Flow [0] < 0) [(b)]	3.984***	2.392**	4.094**
	(4.05)	(2.62)	(2.56)
H_0: (a) = (b) (F-statistic)	8.70***	3.64*	2.72
Controls	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.058	0.051	0.045
No. of obs.	56,141	54,531	42,925

Table 9. Fund flows and ETF trading premium

This table presents OLS regression results of ETF trading premium on fund flows. ETF trading premium is defined as the difference between month-end closing price of the ETF and the NAV divided by the month-end NAV. In Panel A, we run regressions of ETF trading on fund flows and returns over various horizons within a month. In Panel B, we separate all flows and returns into their nonnegative and negative components. In all specifications, we further control for fund characteristics at the previous month-end, namely log fund size, fund age, expense ratio, and turnover. Column (1) presents the results for all corporate ETFs, while we separately consider IG and HY mandate ETFs in columns (2) and (3). All flows and returns are in percentage terms, while the ETF trading premium is in basis points. We include Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline regressions

	ETF trading premium		
	(1)	(2)	(3)
	All corporate ETFs	IG ETFs only	HY ETFs only
Flow [0]	3.622***	2.217***	5.364**
	(3.54)	(6.88)	(3.99)
Flow [-1]	1.152*	1.140	1.534*
	(1.93)	(1.60)	(2.46)
Flow [-5: -2]	1.191***	0.966***	1.500***
	(5.04)	(4.85)	(4.10)
Flow [-10: -6]	1.208***	0.847**	1.712***
	(5.02)	(3.45)	(10.46)
Flow [-20: -11]	0.498***	0.436***	0.566***
	(7.21)	(5.94)	(6.86)
Return [-1]	10.603**	11.448**	9.780
	(2.55)	(3.02)	(1.47)
Return [-5: -2]	5.749***	5.222**	6.947***
	(4.08)	(3.59)	(4.56)
Return [-10: -6]	2.214*	3.069**	1.306
	(2.08)	(2.84)	(0.85)
Return [-20: -11]	2.294***	2.323**	2.154
	(4.01)	(4.49)	(1.82)
Controls	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.316	0.335	0.306
No. of obs.	11,594	7,441	4,153

Panel B. Nonnegative vs. negative flows

	ETF trading premium		
	(1)	(2)	(3)
	All corporate ETFs	IG ETFs only	HY ETFs only
Flow [0] × I(Flow [0] $\geq$ 0) [(a)]	3.267**	1.796**	5.176**
	(3.03)	(3.32)	(3.75)
Flow [0] × I(Flow [0] $<$ 0) [(b)]	5.123***	4.406*	5.442**
	(3.47)	(2.54)	(3.18)
H_0: (a) = (b) (F-statistic)	1.24	1.53	0.02
Controls	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.318	0.337	0.310
No. of obs.	11,594	7,441	4,153

Table 10. Silent swing funds' subsequent flows and flow volatility

This table presents OLS regression results of subsequent (i) 1-day, (ii) 1-week, and (iii) 1-month flows as well as the 1-month daily flow volatility on an indicator denoting whether a fund actively engages in silent swing pricing. We define a swing fund as follows. At each month-end, we run a fund-by-fund regression of the fund-level holding-weighted-average reported price deviation (using all corporate bonds) on fund flow over days 0, -1, [-5: -2], [-10: -6], and [-20: -11] using the monthly observations over the past 36 months, with a minimum of 18 observations. We refer to the coefficient on day 0 flow as the "silent swing coefficient." We then define a fund to be a *swing fund* if its silent swing coefficient is above the median of the Lipper objective peers at the same point in time. In Panel A, we run regressions with the swing fund indicator as the main variable of interest. In Panel B, we interact the swing fund indicator with the two mutually exclusive indicators denoting whether the day 0 flow is nonnegative or negative. In all specifications, we further control for fund characteristics at the previous month-end, namely latest fund return, log fund size, fund age, expense ratio, turnover, TNA-share of institutional classes, and TNA-share of load fee classes, and in Panel B, we further include the standalone negative day 0 flow indicator. All flows are in percentage terms, and flow volatilities are in annualized percentage terms. We include Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline regressions

	Dependent variable			
	Fund flow			Daily flow volatility
	(1)	(2)	(3)	(4)
Horizon:	1-day	1-week	1-month	1-month
Swing fund	-0.011	-0.019	0.103	0.241
	(-1.49)	(-1.25)	(1.54)	(1.37)
Controls	YES	YES	YES	YES
Lipper-by-month FE	YES	YES	YES	YES
Adjusted R-squared	0.029	0.040	0.062	0.080
No. of obs.	36,524	36,407	36,190	36,452

Panel A. Nonnegative vs. negative flows

	Dependent variable			
	Fund flow			Daily flow volatility
	(1)	(2)	(3)	(4)
Horizon:	1-day	1-week	1-month	1-month
Swing fund × I(Flow [0] $\geq$ 0)	-0.024**	-0.053**	0.088	0.554***
	(-2.55)	(-2.46)	(1.03)	(3.47)
Swing fund × I(Flow [0] $<$ 0)	0.008	0.038**	0.188**	-0.140
	(1.05)	(2.10)	(2.40)	(-0.46)
Controls	YES	YES	YES	YES
Lipper-by-month FE	YES	YES	YES	YES
Adjusted R-squared	0.033	0.048	0.074	0.080
No. of obs.	36,524	36,407	36,190	36,452

Table A.1. Number of fund price reports by bond type

This table provides summary statistics of how many price reports by all U.S. fixed income funds and ETFs exist for a given bond at a given month-end, during our sample period between July 2008 and December 2022. We focus on all U.S. dollar-denominated bonds with reported prices between 50 and 200. The summary statistics are computed at the bond-month level.

	No. of obs.	Mean	St. Dev.	P1	P25	P50	P75	P99
All bonds								
All bonds and cash equivalents	26,288,514	3.425	7.450	1	1	1	2	40
Corporate bonds	2,183,864	17.27	18.03	1	4	12	25	81
Municipal bonds	12,326,559	1.934	2.399	1	1	1	2	11
Treasury bonds	198,895	17.49	18.85	1	4	11	25	83
All other bonds	11,483,228	2.157	2.973	1	1	1	2	14
Cash equivalents	95,968	2.277	4.529	1	1	1	2	21
U.S. bonds only								
All bonds and cash equivalents	25,062,506	3.161	7.038	1	1	1	2	38
Corporate bonds	1,512,152	20.06	18.94	1	6	15	28	86
Municipal bonds	12,276,638	1.915	2.265	1	1	1	2	11
Treasury bonds	81,013	24.95	23.78	1	5	20	37	106
All other bonds	11,140,425	2.082	2.775	1	1	1	2	13
Cash equivalents	52,278	2.949	5.972	1	1	1	2	29

Table A.2. Fund flow and reported price deviation of other types of bonds

Panel A of this table presents OLS regression results of a fund's reported price deviation from its peers on fund flows over various intervals within a given month as in Table 2 Panel A, but for other types of bonds. Using the reported price deviation measure as defined in Table 2, we run regressions on fund flow during the last trading day of the month as well as previous flows and returns over the following non-overlapping trading day intervals: -1, [-5: -2], [-10: -6], and [-20: -11]. The cross-sectional unit of observation is each fund-bond pair. In columns (1) through (3), we reported the results for (i) municipal bonds, (ii) Treasury bonds, and (iii) all other types of bonds (ABS, agency etc.). Then, in Panel B, we expand our sample to active bond funds and bond ETFs and interact all flows and returns with the *active fund* indicator, in a manner akin to Table 2 Panel B. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Pricing deviation of active bond funds

	Reported price deviation		
	(1)	(2)	(3)
	Municipal bonds	Treasury bonds	All other bonds
Flow [0]	5.321**	0.593	-0.641
	(2.24)	(0.28)	(-1.21)
Flow [-1]	-1.461	-1.920**	-1.031***
	(-0.85)	(-2.22)	(-2.97)
Flow [-5: -2]	0.210	-0.337	-0.062
	(0.47)	(-0.80)	(-0.40)
Flow [-10: -6]	-1.367***	-0.465*	-0.029
	(-6.69)	(-1.75)	(-0.51)
Flow [-20: -11]	-0.684	-0.158	0.050
	(-1.56)	(-0.56)	(0.74)
Return [-1]	-11.861	-7.304**	-1.571
	(-1.07)	(-2.23)	(-0.72)
Return [-5: -2]	16.915***	-2.813	-0.608
	(2.77)	(-0.64)	(-1.39)
Return [-10: -6]	-3.303	-0.665	-1.445**
	(-1.00)	(-0.46)	(-2.06)
Return [-20: -11]	3.009	-2.444**	-0.796**
	(1.17)	(-2.21)	(-2.13)
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.421	0.539	0.471
No. of obs.	5,917,716	742,669	4,514,324

Panel B. Pricing deviation of active bond funds relative to bond ETFs

	Reported price deviation		
	(1)	(2)	(3)
	Municipal bonds	Treasury bonds	All other bonds
Flow [0]	-2.545	1.011	-0.137
	(-1.65)	(0.83)	(-0.31)
Flow [0] × Active fund	8.899***	-1.000	-0.706
	(3.09)	(-0.65)	(-0.97)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.423	0.559	0.467
No. of obs.	7,298,407	1,149,445	5,247,737

Table A.3. ETF flow and reported price deviation

This table presents OLS regression results of a fund's reported price deviation from its peers on fund flows over various intervals within a given month as in Table 2 Panel A, but for bond ETFs rather than active open-end funds (without pooling the sample). In Panel A, we report the results for corporate bonds, both for all bonds as well as separately for IG and HY bonds, while in Panel B, we report the results for (i) municipal, (ii) Treasury, and (iii) all other types of bonds (ABS, agency etc.). Using the reported price deviation measure as defined in Table 2, we run regressions on fund flow during the last trading day of the month as well as previous flows and returns over the following non-overlapping trading day intervals: -1, [-5: -2], [-10: -6], and [-20: -11]. The cross-sectional unit of observation is each fund-bond pair. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Corporate bonds

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG corporate bonds	HY corporate bonds
Flow [0]	-0.648	-1.757	2.379**
	(-0.47)	(-1.53)	(2.62)
Flow [-1]	-3.060*	-3.457*	-1.591*
	(-1.97)	(-1.85)	(-1.88)
Flow [-5: -2]	0.464*	0.551**	0.386
	(1.96)	(2.62)	(1.53)
Flow [-10: -6]	0.412	0.427	0.220
	(1.23)	(1.16)	(0.86)
Flow [-20: -11]	-0.131	-0.230	0.181
	(-0.71)	(-1.19)	(1.05)
Return [-1]	-1.443	-2.531	13.649
	(-0.17)	(-0.33)	(1.48)
Return [-5: -2]	-2.704	-2.498	-2.252
	(-0.88)	(-0.85)	(-0.72)
Return [-10: -6]	3.129	1.905	11.228*
	(0.95)	(0.72)	(1.77)
Return [-20: -11]	2.127	2.884*	-1.426
	(1.36)	(1.97)	(-1.02)
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.552	0.566	0.572
No. of obs.	6,801,549	5,349,844	1,451,638

Panel B. Other bonds

	Reported price deviation		
	(1)	(2)	(3)
	Municipal bonds	Treasury bonds	All other bonds
Flow [0]	-2.658	1.208	-0.268
	(-0.99)	(0.87)	(-0.45)
Flow [-1]	5.096	-1.709	0.198
	(1.35)	(-1.05)	(0.35)
Flow [-5: -2]	-1.573	0.355	-0.235
	(-1.30)	(0.91)	(-0.69)
Flow [-10: -6]	-0.572	-0.675	-0.247
	(-0.61)	(-1.72)	(-1.37)
Flow [-20: -11]	-0.100	0.017	-0.264**
	(-0.21)	(0.09)	(-2.23)
Return [-1]	-68.888	-6.110*	-3.483
	(-1.28)	(-1.81)	(-0.84)
Return [-5: -2]	4.796	-4.581	0.227
	(0.41)	(-1.19)	(0.11)
Return [-10: -6]	41.062*	0.025	-0.189
	(1.82)	(0.01)	(-0.12)
Return [-20: -11]	3.776	1.741	-0.102
	(0.40)	(0.98)	(-0.14)
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.558	0.635	0.626
No. of obs.	800,216	382,883	442,480

Table A.4. Fund flow and corporate bond reported price deviation: Alternative specifications

This table presents OLS regression results of a fund's reported price deviation from its peers on fund flows over various intervals within a given month as in Table 2 Panel A, but with different specifications. In Panel A, we include past returns as well as the contemporaneous fund return in addition to the past flow terms. In Panel B, we control only for flows over -1, [-5: -2], [-10: -6], and [-20: -11], excluding past returns as controls. Finally, in Panel C, we use the identical set of flow and return controls, but without bond-by-month fixed effect. The cross-sectional unit of observation is each fund-bond pair. In column (1), we consider all corporate bonds with U.S. CUSIPs and credit rating information available in Mergent FISD. In columns (2) and (3), we separately consider investment grade (IG) and high yield (HY) bonds. For bonds with two credit ratings, we take the lower of the two, while for those with three credit ratings, we take the median value. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in Panels A and B, while we only include Lipper-objective-by-month fixed effect in Panel C. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Adding contemporaneous fund return as an additional control

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	2.779**	2.023	3.778***
	(2.75)	(1.62)	(4.45)
Flow [-1]	-2.764**	-1.638	-4.107***
	(-2.70)	(-1.09)	(-4.56)
Flow [-5: -2]	-0.334	-0.290	-0.325
	(-1.22)	(-1.20)	(-0.90)
Flow [-10: -6]	-0.463*	0.109	-1.005***
	(-1.73)	(0.50)	(-5.02)
Flow [-20: -11]	-0.375**	-0.121	-0.666***
	(-2.18)	(-1.03)	(-3.53)
Return [0]	27.390***	34.721***	22.869***
	(3.66)	(4.93)	(3.66)
Return [-1]	-0.778	-0.607	-0.783
	(-0.23)	(-0.17)	(-0.24)
Return [-5: -2]	-2.047	-2.676	-1.111
	(-0.67)	(-1.30)	(-0.21)
Return [-10: -6]	-2.630**	-1.690*	-4.397***
	(-2.59)	(-1.99)	(-3.20)
Return [-20: -11]	-1.647*	-0.326	-3.329**
	(-1.90)	(-0.29)	(-2.37)
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.476	0.524	0.466
No. of obs.	10,981,561	6,258,526	4,722,931

Panel B. Excluding past returns from controls

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	4.521***	2.856**	6.091***
	(3.86)	(2.27)	(7.83)
Flow [-1]	-3.372**	-1.867	-4.967***
	(-2.60)	(-1.13)	(-4.48)
Flow [-5: -2]	-0.563**	-0.384*	-0.675*
	(-2.39)	(-1.79)	(-2.02)
Flow [-10: -6]	-0.675**	-0.028	-1.286***
	(-2.40)	(-0.15)	(-6.55)
Flow [-20: -11]	-0.329*	-0.099	-0.598***
	(-1.97)	(-0.84)	(-3.13)
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.471	0.516	0.462
No. of obs.	10,981,757	6,258,534	4,723,119

Panel C. Without bond-by-month fixed effect

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	3.864***	2.365	5.335***
	(3.30)	(1.68)	(7.22)
Flow [-1]	-3.049**	-1.710	-4.531***
	(-2.19)	(-0.82)	(-4.34)
Flow [-5: -2]	-0.478*	-0.313	-0.525*
	(-2.00)	(-1.26)	(-1.73)
Flow [-10: -6]	-0.574*	0.036	-1.175***
	(-2.04)	(0.17)	(-5.86)
Flow [-20: -11]	-0.325*	-0.103	-0.605***
	(-1.91)	(-0.87)	(-3.06)
Return [-1]	-7.358**	-6.504***	-7.215*
	(-2.72)	(-3.34)	(-1.88)
Return [-5: -2]	-5.761	-5.359**	-5.883
	(-1.49)	(-2.19)	(-0.85)
Return [-10: -6]	-4.981**	-2.679**	-7.911***
	(-2.64)	(-2.55)	(-3.38)
Return [-20: -11]	-2.210**	-1.183	-4.162***
	(-2.47)	(-0.91)	(-3.47)
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.015	0.017	0.020
No. of obs.	11,147,485	6,406,033	4,741,347

Table A.5. Fund flow and corporate bond reported price deviation: Funds sharing the same benchmark

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and the active fund indicator for a pooled sample of active bond funds and ETFs as in Table 2 Panel B, albeit with benchmark-by-bond-by-month fixed effect to enable comparison of pricing among funds sharing the same stated benchmark. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also interacted with the active fund indicator in each instance, whose coefficient values we omit for brevity. In column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. All flows and returns are in percentage terms and the reported price deviation measure is in basis points. We include benchmark-by-bond-by-month fixed effect in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	-2.891**	-3.375***	-1.834
	(-2.27)	(-3.24)	(-1.04)
Flow [0] × Active fund	8.566***	6.241***	10.662***
	(3.99)	(4.03)	(3.56)
Controls	YES	YES	YES
BM-by-bond-by-month FE	YES	YES	YES
Adjusted R-squared	0.505	0.459	0.546
No. of obs.	8,872,218	5,582,408	3,289,810

Table A.6. Fund flow and reported price deviation: Time-to-maturity baskets

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow, but separately for various time-to-maturity baskets: (i) shorter than 5 years, (ii) 5 to 10 years, and (iii) longer than 10 years. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are included, whose coefficient values we omit for brevity. In each panel, in column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. The cross-sectional unit of observation is each fund-bond pair. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Shorter than 5 years

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	2.649***	1.585**	4.170***
	(3.10)	(2.08)	(4.41)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.464	0.493	0.468
No. of obs.	4,388,769	2,833,747	1,554,877

Panel B. 5 to 10 years

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	5.939***	3.090**	7.174***
	(5.41)	(2.16)	(9.94)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.464	0.518	0.461
No. of obs.	4,665,938	1,865,845	2,799,945

Panel C. Longer than 10 years

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	5.490**	5.960**	4.334***
	(2.41)	(2.13)	(3.98)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.529	0.549	0.465
No. of obs.	1,824,667	1,501,378	323,134

Table A.7. Fund flow, reported price deviation, and fund mandate

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and mutually exclusive fund mandate indicators. We group all active general and corporate bond funds into IG and HY mandate funds based on their Lipper objectives as in Choi, Kronlund, and Oh (2022). In Panel A, with the reported price deviation defined in Table 2 as the dependent variable, we interact day 0 fund flow with the IG and HY mandate fund indicators. All non-overlapping previous fund flow and return terms as well as their nonnegative and negative components are also interacted with the two mutually exclusive mandate indicators, whose coefficient values we omit for brevity. We further report F-statistics testing the hypothesis that the coefficients on the respective interactions of day 0 fund flow with the IG and HY mandate indicators are equal. In Panel B, we separate flows and returns into negative and nonnegative components and interact each with the mutually exclusive IG and HY mandate fund indicators. The cross-sectional unit of observation is each fund-bond pair. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline regressions

	Reported price deviation
Flow [0] × IG mandate fund[(a)]	4.244**
	(2.69)
Flow [0] × HY mandate fund[(b)]	4.748***
	(3.84)
H_0: (a) = (b) (F-statistic)	0.08
Controls	YES
Bond-by-month FE	YES
Lipper-by-month FE	YES
Adjusted R-squared	0.469
No. of obs.	10,701,859

Panel B. Nonnegative vs. negative flows

	Reported price deviation
Flow [0] × I(Flow [0] $\geq$ 0) × IG mandate [(a)]	3.210
	(1.46)
Flow [0] × I(Flow [0] $\geq$ 0) × HY mandate [(b)]	0.098
	(0.03)
Flow [0] × I(Flow [0] $<$ 0) × IG mandate [(c)]	6.402**
	(2.91)
Flow [0] × I(Flow [0] $<$ 0) × HY mandate [(d)]	12.093***
	(4.06)
H_0: (a) = (c) (F-statistic)	1.31
H_0: (b) = (d) (F-statistic)	4.24*
Controls	YES
Bond-by-month FE	YES
Lipper-by-month FE	YES
Adjusted R-squared	0.473
No. of obs.	10,981,757

Table A.8. Fund flow, reported price deviation, and bond return volatility

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and annualized bond return volatility measure. We compute the standard deviation of daily bond returns during the previous month, with all institutional trades (defined as those with trading value greater than $100,000) as reported in TRACE to calculate the return (and subsequently volatility) measures. In columns (1) through (3), daily returns are calculated using the value-weighted average price (VWAP) during a trading day, while in columns (4) through (6), we use the last traded price of the trading day. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also interacted with the bond return volatility measure, whose coefficient values we omit for brevity. In columns (1) and (4), we consider all corporate bonds, while in columns (2)-(3) and (5)-(6), we separately consider IG and HY bonds. The cross-sectional unit of observation is each fund-bond pair. All flows and returns in percentage terms, while the volatility measure is in raw value and the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Reported price deviation					
Daily return measured using:		VWAP			Last traded price	
	(1)	(2)	(3)	(4)	(5)	(6)
	All corporates	IG only	HY only	All corporates	IG only	HY only
Flow [0]	2.513**	1.884*	3.735***	2.574**	2.044*	3.686**
	(2.50)	(1.97)	(2.97)	(2.47)	(2.00)	(2.83)
Flow [0] × Bond return volatility	15.763**	15.727	12.727**	12.241**	10.885	10.830**
	(2.63)	(1.51)	(2.21)	(2.30)	(1.30)	(2.19)
Controls	YES	YES	YES	YES	YES	YES
Bond-by-month FE	YES	YES	YES	YES	YES	YES
Lipper-by-month FE	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.485	0.525	0.459	0.485	0.525	0.459
No. of obs.	7,054,815	4,764,683	2,290,003	7,054,815	4,764,683	2,290,003

Table A.9. Reported prices and TRACE price range

In this table, we tabulate how the funds' reported prices relate to the range of traded prices as reported on TRACE during the last trading day of the month. We only consider institutional trades, defined as those with trading value greater than $100,000, to calculate the price range. We report the percentage of reported prices that are (i) less than the minimum traded price, (ii) within the traded price range, and (iii) more than the maximum traded prices, both for all corporate bonds as well as for IG and HY bonds only.

	(1) All corporate bonds	(2) IG bonds only	(3) HY bonds only
Below minimum traded price	29.03%	29.50%	27.99%
Within the traded price range	50.83%	50.44%	51.70%
Above maximum traded price	20.14%	20.07%	20.31%
All	100.00%	100.00%	100.00%

Table A.10. Aggregate fund flow and bond pricing relative to traded prices

This table presents OLS regression results of the likelihood of a fund reporting its security above or below the traded price range on aggregate fund flow. At each month-end, we calculate the percentage of funds reporting its corporate bonds (i) below the minimum traded price range (Panel A) or (ii) above the maximum traded price range (Panel B). We use all institutional trades exceeding $100,000 on the last trading day of the month to calculate the traded price range. We calculate the percentage separately for (i) all corporate bonds, (ii) IG corporate bonds, and (iii) HY corporate bonds. We then calculate aggregate flows into and out of all active general and corporate bond funds in our sample over various horizons within a month and further calculate aggregate-level weighted-average fund returns over the same horizon. All flows and returns are in percentage terms. Regressions are conducted at the monthly level. *t*-statistics computed using Newey-West (1987) standard errors up to three lags are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Below minimum traded price

	Below minimum traded price (%)		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	13.586*	19.753**	5.199
	(1.72)	(2.44)	(0.42)
Flow [-1]	30.730***	45.018***	10.868
	(2.67)	(3.52)	(0.79)
Flow [-5: -2]	1.916	1.253	2.051
	(0.59)	(0.33)	(0.57)
Flow [-10: -6]	-3.908	-7.954*	3.680
	(-1.06)	(-1.87)	(0.98)
Flow [-20: -11]	-0.936	-0.989	-0.797
	(-0.65)	(-0.61)	(-0.51)
Return [-1]	10.763**	8.671*	13.796**
	(2.32)	(1.71)	(2.60)
Return [-5: -2]	-1.883	-2.463	-1.442
	(-1.25)	(-1.58)	(-0.83)
Return [-10: -6]	-0.184	0.398	-1.638
	(-0.15)	(0.27)	(-1.22)
Return [-20: -11]	0.501	0.645	0.445
	(0.58)	(0.69)	(0.48)
Adjusted R-squared	0.077	0.088	0.040
No. of monthly obs.	172	172	172

Panel B. Above maximum traded price

	Above maximum traded price (%)		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	-7.121	-13.019**	2.999
	(-1.52)	(-2.29)	(0.42)
Flow [-1]	-13.269**	-20.365***	0.248
	(-2.04)	(-2.68)	(0.03)
Flow [-5: -2]	-0.814	-1.384	0.762
	(-0.44)	(-0.55)	(0.42)
Flow [-10: -6]	1.416	3.833*	-3.049
	(0.77)	(1.70)	(-1.30)
Flow [-20: -11]	0.886	1.069	0.433
	(1.31)	(1.27)	(0.66)
Return [-1]	-3.384	-2.761	-4.050
	(-1.57)	(-1.10)	(-1.47)
Return [-5: -2]	-0.679	-0.586	-0.757
	(-1.01)	(-0.78)	(-0.83)
Return [-10: -6]	0.553	0.267	1.160
	(0.94)	(0.35)	(1.36)
Return [-20: -11]	-0.220	-0.478	0.230
	(-0.47)	(-0.88)	(0.52)
Adjusted R-squared	0.052	0.085	-0.018
No. of monthly obs.	172	172	172

Table A.11. Fund flow, reported price deviation, and other fund characteristics

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and various other fund and portfolio characteristics. In Panel A, we consider previous month-end TNA share of load fee classes within the fund, which we denote *load fee class*. In Panel B, we consider fund age. In Panel C, we consider fund cash holdings, namely the fraction of cash and cash equivalent securities in the latest fund portfolio. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also interacted with the respective characteristic in each instance, whose coefficient values we omit for brevity. In each panel, in column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. The cross-sectional unit of observation is each fund-bond pair. All flows and returns are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. TNA-share of load fee classes

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	5.176***	3.095**	7.592***
	(3.04)	(2.10)	(5.79)
Flow [0] × Load fee class	-1.997	-2.783	-3.723**
	(-1.14)	(-1.01)	(-2.24)
Load fee class	-0.151***	-0.115***	-0.167***
	(-4.79)	(-6.56)	(-5.70)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.475	0.518	0.467
No. of obs.	10,942,772	6,238,887	4,703,780

Panel B. Fund age

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	-0.800	-2.300*	0.726
	(-0.56)	(-1.75)	(0.39)
Flow [0] × Fund age	0.353***	0.364***	0.340***
	(4.66)	(4.04)	(3.19)
Fund age	0.001	0.001	0.000
	(0.51)	(0.64)	(0.01)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.473	0.518	0.463
No. of obs.	10,942,772	6,238,887	4,703,780

Panel C. Portfolio cash holdings

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	3.862***	2.249	5.263***
	(3.10)	(1.65)	(5.00)
Flow [0] × Cash holdings	0.133	0.198**	0.012
	(1.24)	(2.18)	(0.06)
Cash holdings	0.012***	0.010***	0.018***
	(5.04)	(3.63)	(7.32)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.485	0.533	0.476
No. of obs.	10,874,237	6,194,390	4,679,747

Table A.12. Fund flow, reported price deviation, and fund family market share

This table presents OLS regression results of a fund's corporate bond pricing deviation from its peers on the interaction of fund flow and the TNA-share of ETFs within the fund family. For each fund-month, we first construct (i) *family market share*, defined as the family's market share within the general and corporate bond fund and ETF market (Panel A). In Panel B, we restrict our attention to the open-end funds only (i.e., excluding ETFs) to construct *family open-end market share*. All non-overlapping previous fund flow and return terms over days -1, [-5: -2], [-10: -6], and [-20: -11] are also interacted with the respective market share characteristic in each instance, whose coefficient values we omit for brevity. In each panel, in column (1), we consider all corporate bonds, while in columns (2) and (3), we separately consider IG and HY bonds. All flows, returns, and market shares are in percentage terms, while the reported price deviation measure is in basis points. We include bond-by-month and Lipper-objective-by-month fixed effects in all specifications. *t*-statistics computed using standard errors that are robust to heteroskedasticity and two-way clustered by Lipper objective and month are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Family market share

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	0.478	0.708	0.540
	(0.33)	(0.56)	(0.33)
Flow [0] × Family market share	3.179***	1.316***	4.868***
	(3.34)	(3.54)	(7.34)
Family market share	0.079***	0.068***	0.096***
	(12.47)	(13.27)	(10.49)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.500	0.549	0.489
No. of obs.	10,653,477	6,089,105	4,564,299

Panel B. Family open-end market share

	Reported price deviation		
	(1)	(2)	(3)
	All corporate bonds	IG bonds only	HY bonds only
Flow [0]	3.562**	2.883**	3.862**
	(2.70)	(2.06)	(2.49)
Flow [0] × Family open-end market share	1.542	0.399	3.238**
	(1.49)	(0.88)	(2.47)
Family open-end market share	0.018***	0.015**	0.024
	(2.79)	(2.33)	(1.48)
Controls	YES	YES	YES
Bond-by-month FE	YES	YES	YES
Lipper-by-month FE	YES	YES	YES
Adjusted R-squared	0.472	0.518	0.463
No. of obs.	10,653,477	6,089,105	4,564,299