Offshore Hedge Funds and Sovereign Risk Spreads*

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March 26, 2026

*First version: 13/01/2026.

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Disclaimer: I am grateful to Lennart Dekker, Maik Schmeling and Davide Tomio for helpful comments and suggestions. This paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the author and do not necessarily reflect those of the ECB

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Abstract

This paper investigates how the leveraged positioning of offshore hedge funds amplifies sovereign bond yield volatility. Combining granular regulatory transaction-level data on repo positions with high-frequency monetary policy surprises, I document a causal non-bank amplification channel. The analysis yields four key results. First, hedge fund presence significantly increases yield sensitivity to policy shocks. An average four basis point surprise raises yields by an additional 1.2 basis points. Second, this effect scales with the intensity of hedge fund positioning relative to the bond's issue size. Third, the transmission is asymmetric and state-dependent. While easing shocks have a limited impact, tightening shocks induce deleveraging in long positions and directional momentum trading in short positions. Fourth, this amplification has an impact on market fragmentation. Specifically, an average four basis points tightening shock temporarily widens the core-periphery spread by approximately one basis point. Finally, I show that the mechanism generalizes across sovereign bond markets wherever hedge funds hold directional exposure, but is neutralized when leveraged positions carry a near-perfect hedge against the same underlying.

JEL Classification: G12, G14

Keywords: Repo market, NBFI, Sovereign spread, Fragmentation

1. Introduction

The role of hedge funds in financial markets can be viewed from two opposing perspectives. The first emphasizes their contribution to market efficiency. By correcting mispricings and providing liquidity, hedge funds push prices toward fundamental value (Gromb and Vayanos, 2002; Vayanos and Vila, 2021). The second emphasizes the risks arising from their reliance on leverage. When funding conditions deteriorate, forced liquidations can push prices further from fundamentals rather than closer to them (Shleifer and Vishny, 1997; Brunnermeier and Pedersen, 2009; Geanakoplos, 2010). Yet whether hedge funds stabilize or amplify in a given situation depends on the specific features of their positioning, and empirical evidence that identifies these features is scarce.

This question has become more important as the financial system has shifted toward non-bank financial intermediation. Since the global financial crisis, tighter regulation of traditional banks has increased the role of non-bank financial intermediaries (NBFIs) in financial markets. Among these, offshore hedge funds have attracted particular attention because of their opacity and strong use of leverage (Barth, Beltran, Hoops, Kahn, Liu, and Perozek, 2025). These funds frequently rely on short-term repurchase agreements to finance their trading positions, making them highly sensitive to sudden changes in the value of collateral. The fragility of this funding model was exposed during the market turmoil of March 2020 when forced deleveraging by hedge funds exacerbated liquidity stress in the US Treasury market (Barth and Kahn, 2025; Kruttli, Monin, Petrasek, and Watugala, 2025; Aramonte, Schrimpf, and Shin, 2023). Yet despite the growing importance of these entities, granular data on their repo positioning has been largely unavailable, limiting our ability to assess the conditions under which they stabilize or destabilize markets. This is particularly relevant for sovereign bond markets, where yield movements directly affect the transmission of monetary policy and the fiscal sustainability of governments.

In this paper, I study how the leveraged positioning of offshore hedge funds shapes the transmission of shocks to sovereign bond yields. To do so, I use the ECB's Securities Financing Transactions Data Store (SFTDS), a novel regulatory dataset that provides a granular transaction-level view of the Euro area repo market. This data allows me to precisely track the daily positioning of offshore hedge funds across individual sovereign bonds. I combine this micro data with high-frequency monetary policy surprises, which serve as a laboratory for studying how leveraged positions react to exogenous price changes. By interacting the outstanding net positions of hedge funds with the shock, I identify

the additional yield sensitivity that arises specifically because hedge funds are active in a given bond. Since the SFTDS captures the near-universe of repo transactions involving at least one euro area-established entity regardless of currency denomination, the dataset also covers a subset of US Treasury transactions. This allows me to test whether the amplification channel generalizes beyond the euro area.

I document two mechanisms that link hedge fund positioning with sovereign bond yields. The first follows the literature on liquidity spirals (Brunnermeier and Pedersen, 2009; Geanakoplos, 2010; Adrian and Shin, 2010). When a negative price shock reduces the value of collateral pledged in repo, the fund is forced to sell assets into a falling market to restore its margin ratio. This pushes yields further than the fundamental shock would imply, predicting amplification specifically when prices move against the hedge fund's position. The second mechanism follows the literature on time-series momentum and anticipatory trading (Moskowitz, Ooi, and Pedersen, 2012; De Long, Shleifer, Summers, and Waldmann, 1990). When prices move in favor of the position, the fund interprets the shock as trend confirmation and builds upon its exposure. Sophisticated funds may further increase their positions in anticipation that the initial price movement will trigger additional trading by other market participants, compounding the amplification. Importantly, both mechanisms depend only on the magnitude and direction of the price change and are therefore not specific to monetary policy but could apply to any market-moving event.

My analysis reveals that amplification operates along two dimensions. The first relates to the direction of hedge fund positioning relative to the shock. The second relates to the structure of the hedge.

With respect to the first dimension, I document four findings. First, the simple presence of hedge funds in a bond significantly amplifies its sensitivity to monetary policy. When comparing two otherwise similar bonds, the one with active hedge fund participation reacts significantly more to the same monetary policy surprise. Specifically, the presence of hedge funds adds approximately 1.2 basis points to the yield change induced by an average four basis point shock. Thus, nearly one-third of the price movement in these securities is driven not by the fundamental news itself but by the activity of offshore hedge funds.

Second, I show that this amplification effect scales with the size of the hedge fund position. A larger repo position relative to the total amount issued implies a stronger yield reaction. This finding is critical for identification because it helps rule out the concern about selection bias, meaning that

hedge funds simply select bonds that are naturally more volatile. The fact that the yield sensitivity increases in proportion to the exposure size points to a mechanical link between the size of leveraged positions and the resulting yield movements.

Third, decomposing the data further reveals that this aggregate amplification is driven by the two mechanisms discussed above, depending on the direction of the position relative to the shock. The first is deleveraging. When the policy shock moves prices against the position of hedge funds, positions have to be unwound resulting in yield movement amplification. I find the clearest evidence for this in long positions during tightening shocks. The second mechanism refers to trend following or momentum trading. This is the case when the policy shock moves prices in favor of the position of hedge funds. I find this to be most prominent for short positions during tightening shocks where hedge funds actively increase their exposure to the winning trade.

Fourth, these asymmetries have direct implications for market fragmentation between core and periphery issuers. I find that momentum trading during tightening surprises increases the core-periphery spread temporarily. While hedge funds use short positions in the core as a hedge, they take directional bets using bonds from the periphery. Consequently, an average four basis points tightening shock temporarily widens the spread between German and Italian yields by approximately one basis point which highlights a specific channel through which non-bank positioning impairs the uniform transmission of monetary policy.

These four findings establish the amplification channel in the euro area, where hedge fund strategies such as core-periphery trades are dominant. Whether the channel generalizes depends on the second dimension, which is the structure of the hedge. US Treasury markets provide a natural test because strategies such as the cash-futures basis trade, which involves positions that are hedged against the same underlying asset and thereby neutralizes the collateral pressure and trend signals that drive amplification, are more prevalent. On aggregate, the amplification mechanism does not appear in US Treasuries, which I attribute to the prevalence of this type of hedged positioning. Consistent with this explanation, the amplification channel is operative in the period before the basis trade became prevalent and, within the cross-section, in bonds where basis trades are unlikely. These findings confirm that the mechanism generalizes wherever hedge funds maintain directional exposure, but is absorbed when leveraged positions carry a near-perfect hedge against the same underlying. This does not imply that such hedged positions are free of risk, as the basis trade poses its own systemic concerns through different channels (Barth and Kahn, 2025; Kashyap, Stein, Wallen,

and Younger, 2025).

These findings have direct implications for how policymakers assess the risks stemming from hedge fund activity in sovereign bond markets. The analysis shows that neither the size of hedge fund positions nor their mere presence is sufficient to evaluate the risk. Instead, policymakers must consider the direction of the positioning relative to the prevailing shock environment and the structure of the hedge. Long positions primarily amplify the general level of yields, raising broad funding costs without affecting the core-periphery spread. Short positions, in contrast, induce differential responses across issuers and thereby threaten the uniform transmission of monetary policy. At the same time, positions can have fundamentally different implications for yield volatility depending on whether they carry directional exposure or are hedged against the same underlying. Assessing the risks from hedge fund leverage therefore requires granular information on both the nature of the positions and the strategies in which they are embedded.

Related literature. This paper relates to at least three strands of the literature. The first is monetary policy transmission and sovereign bond yields. The euro area sovereign bond market is unique due to its heterogeneity. This gives rise to the so-called core-periphery spread as countries in the 'core' are perceived to have a different risk profile than countries in the 'periphery', even though they share a single monetary policy. Ehrmann and Fratzscher (2017) show that this fragmentation can also be desirable during a crisis scenario as shocks do not spill over from one sovereign to another. Assessing the differences in sovereign yields between core and periphery countries can be challenging. On the one hand, the transmission mechanism depends on the financial fragility of a sovereign (Ciccarelli, Maddaloni, and Peydró, 2013). On the other hand, parts of the movements in sovereign bond yields, especially during crisis, can be disconnected from underlying fundamentals (De Grauwe and Ji, 2013). The ECB has used several policy tools to address movements away from fundamentals as assessed by Krishnamurthy, Nagel, and Vissing-Jorgensen (2018). This paper adds to this strand of the literature by identifying a non-bank amplification channel in sovereign bond markets that influences the magnitude of the core-periphery spread.

The second strand of the literature relates to leverage constraints, margins and fire sales. It is well established in the literature that arbitrageurs require capital (Shleifer and Vishny, 1997; Gromb and Vayanos, 2002). However, since the global financial crisis, leverage cycles are studied more closely. This refers to a self-reinforcing mechanism in which bad news cause volatility in asset prices

and lead to binding funding constraints, resulting in increasing margin requirements, which in turn tightens funding constraints further (Brunnermeier and Pedersen, 2009; Geanakoplos, 2010; Adrian and Shin, 2010). This feedback loop has materialized in the recent past. For instance, Avalos and Sushko (2023) argue that this mechanism was an important part of the 2019 US Treasury market turmoil as rising initial margins induced deleveraging. Still, recent work has shown that margin requirements for hedge funds continue to be low, enabling high levels of leverage (Banegas and Monin, 2023; Hermes, Schmeling, and Schrimpf, 2025). I add to this literature by showing that this deleveraging mechanism can translate into volatility in sovereign bond markets.

The third strand of the literature is the role of non-bank financial intermediation and in particular hedge funds. Aramonte, Schrimpf, and Shin (2023) provide an overview of different kinds of NBFIs and the risks emanating from them. They argue that the main systemic risk related to hedge funds stems from their use of leverage. Hedge funds and leverage have also been a key to the march 2020 dash-for-cash episode (Barone, Chaboud, Copeland, Kavoussi, Keane, and Searls, 2022; Barth and Kahn, 2025; Kruttli, Monin, Petrasek, and Watugala, 2025; Kashyap, Stein, Wallen, and Younger, 2025), and Pelizzon, Subrahmanyam, and Tomio (2025) show that certain trading strategies employed by hedge funds can be induced by central bank policies such as quantitative easing. Moreover, hedge funds are relying less on one single prime broker as they did in the past, but rather on several, enabling them to face more favorable margin requirements and diversify idiosyncratic prime broker risk (Dahlquist, Rottke, and Sokolovski, 2023; Bittner and Jank, 2025). Most directly related to this paper is the work by Anaya, Cera, Georgiadis, and Kaufmann (2025) who show that hedge funds shed periphery bonds while not adjusting the core in response to euro area disaster risk. I add to this literature by analyzing the role of hedge fund leverage in response to monetary policy shocks.

The paper is structured as follows. Section 2 introduces the dataset and provides summary statistics. Section 3 documents the stylized facts. Section 4 outlines the mechanisms linking hedge fund positioning to sovereign bond yields. Section 5 details the identification strategy. Section 6 presents the empirical findings. Section 7 extends the analysis to the US Treasury Market, and Section 8 concludes.

2. Data

I use the European Central Bank's Securities and Financing Transactions Data Store (SFTDS) to identify hedge fund repo positions. This novel regulatory dataset, established under the Securities Financing Transactions Regulation (SFTR), provides a granular transaction-level view of the euro area repo market, containing precise information on counterparty identities, collateral ISINs, loan volumes, rates, haircuts, and maturities. It covers the near-universe of transactions involving at least one Euro area-established entity. Given the dealer-intermediated nature of the sovereign bond market, where trading happens predominantly via Euro area dealers, this dataset effectively captures the entire repo activity of non-bank financial intermediaries.

My sample focuses on Euro-denominated reverse repo and repo transactions collateralized by Italian and German sovereign bonds between January 2021 and November 2025. I isolate offshore hedge fund activity by restricting the sample to counterparties domiciled in the Cayman Islands (see Barth, Beltran, Hoops, Kahn, Liu, and Perozek, 2025, for a discussion on the relevance of Cayman Island domiciled hedge funds) and further refine this classification using the sector-identification algorithm of Lenoci and Letizia (2021).

Second, I obtain daily bond-level characteristics from Bloomberg. Most importantly, I source daily yields for each ISIN to compute the dependent variable. The dataset also includes the issue size, residual maturity, and the bid-ask spread as a proxy for market liquidity. To capture the specific demand dynamics of the futures market, I construct a *Cheapest-to-Deliver* (CTD) indicator. Following Pelizzon, Subrahmanyam, and Tomio (2025), I identify the CTD bond for each futures contract by observing the actual delivery outcomes on Eurex, assuming the delivered bond acted as the CTD security throughout the life of the corresponding contract. Finally, I merge these characteristics with the repo transaction data at the ISIN-day level.

Finally, I capture exogenous market variation using high-frequency intraday monetary policy surprises from the Euro Area Monetary Policy Event-Study Database (EA-MPD) (Altavilla, Brugnolini, Gürkaynak, Motto, and Ragusa, 2019). I specifically employ the intraday changes in benchmark sovereign bond yields during the ECB press conference window. Unlike standard OIS-based measures which capture the pure risk-free rate surprise, using the sovereign benchmark reaction allows me to construct a more direct comparison. By matching each ISIN in my sample to the high-frequency shock of its corresponding maturity-country benchmark, I can isolate how much more a given bond

Table I: Summary Statistics

	Mean	SD	P25	Median	P75	N
Panel A: Bond Market Variables (Full Sample)						
Daily Yield Change ($\Delta y_{i,t}$, bps)	0.15	8.59	-2.15	0.00	2.65	418,928
Residual Maturity (Years)	7.33	8.04	1.40	4.80	10.40	444,445
Bid-Ask Spread (bps)	0.25	0.38	0.03	0.08	0.28	420,016
Amount Issued (€bn)	15.68	7.58	9.45	14.50	20.50	444,445
CTD Indicator (Dummy)	0.04	0.19	0.00	0.00	0.00	444,445
Panel B: Hedge Fund Positioning						
HF Presence Indicator (Dummy)	0.59	0.49	0.00	1.00	1.00	444,445
Full Sample (Unconditional):						
Net Position (% of Issued)	1.86	3.28	0.00	0.37	2.33	442,167
Long Intensity (% of Issued)	0.90	2.81	0.00	0.00	0.12	443,843
Short Intensity (% of Issued)	0.95	2.20	0.00	0.00	0.54	444,281
Active Sample (Conditional on Presence):						
Net Position (% of Issued)	3.15	3.76	0.64	1.77	4.31	261,308
Long Intensity (% of Issued)	3.45	4.65	0.58	1.60	4.36	115,965
Short Intensity (% of Issued)	3.04	3.04	0.73	2.00	4.43	138,232
Panel C: Repo Contract Terms (Active Transactions Only)						
Avg. Haircut (Long, %)	0.24	0.53	0.00	0.12	0.30	116,567
Avg. Haircut (Short, %)	-0.08	0.21	-0.15	-0.04	0.00	138,396
Avg. Maturity (Long, Days)	14.98	16.28	6.30	10.17	17.47	116,567
Avg. Maturity (Short, Days)	17.45	19.63	7.86	12.50	21.09	138,396
Panel D: Monetary Policy Shocks (Shock days only)						
MP Surprise (All, bps)	0.26	4.93	-2.50	-0.10	2.65	12,964
Tightening Surprise (> 0, bps)	4.13	3.53	1.35	3.10	5.80	6,289
Easing Surprise (< 0, bps)	-3.39	2.85	-4.35	-2.50	-1.35	6,675

Notes: This table reports summary statistics for the daily panel of Italian and German sovereign bonds from January 2021 to November 2025. *Net Position* and *Intensity* variables are calculated as the five-day moving average of positions scaled by the total amount outstanding. Panel B reports these statistics first for the full sample (including zeros) and second for the active sample (excluding zeros) to illustrate the typical trade size. Panel C reports average contract terms calculated only for active observations. Panel D reports the monetary policy surprise statistics for shock days only.

reacts and how much of that is attributable to hedge fund positioning. As a robustness check, I verify that all main results hold when replacing the benchmark shock with the 2-year OIS rate change (see Appendix B1).

2.1. Descriptive Statistics

Table I presents descriptive statistics for the final merged panel. Panel A shows that, while the average daily yield change is close to zero, the standard deviation is 8.59 basis points. The market is highly liquid, characterized by an average bid-ask spread of just 0.25 basis points, and the average bond in the sample has a residual maturity of approximately 7.3 years.

Panel B highlights the significant footprint of offshore hedge funds. Hedge funds are active in the market, holding positions on 59% of all bond-days. Crucially, the table distinguishes between the unconditional market footprint as well as conditional on hedge funds being active in the bonds. While the full-sample net position averages 1.86% of issuance, this figure rises to 3.15% conditional on active participation. Thus, they hold economically meaningful fractions of the outstanding debt. The roughly symmetric split between long and short intensities (3.45% vs. 3.04% in the active sample) confirms that hedge funds use these markets for both directional bets and relative value strategies.

Panel C provides evidence for the leveraged nature of hedge fund activity. Haircuts on long positions average just 0.24%, implying that hedge funds can achieve leverage ratios well in excess of 100x on these safe assets. The average repo maturity is approximately two weeks (15–17 days), indicating a mix of overnight funding and term financing. Finally, Panel D summarizes the exogenous shocks. The average tightening surprise is 4.13 basis points, while the average easing surprise is -3.39 basis points.

3. Stylized Facts

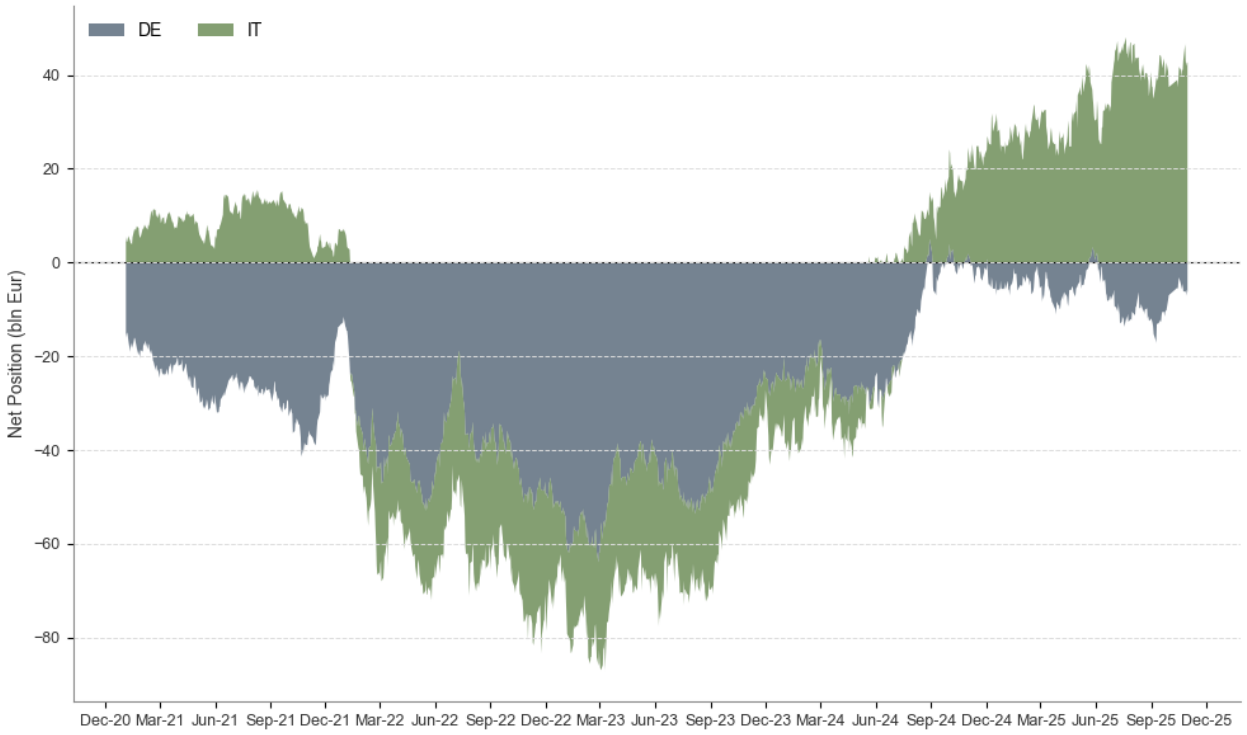
3.1. Trading Regimes

To interpret trading patterns, I first map repo market activity to the underlying directional exposure of hedge funds. Since hedge funds use the repo market primarily to finance leveraged positions or source securities for short selling, the direction of the repo transaction serves as a proxy for their trading position. Specifically, I classify net cash borrowing (repo) as a proxy for leveraged long positions, where the fund posts the bond as collateral to finance its purchase. Conversely, I classify net cash lending (reverse repo) as a proxy for short positions, where the fund borrows the specific bond to sell it in the cash market.

Figure 1 plots the aggregate net repo positions of offshore hedge funds for German and Italian sovereign bonds. The evolution of these positions reveals a distinct regime shift in trading strategy conditional on the monetary policy cycle. In the period preceding the ECB's hiking cycle, positioning follows a classic 'carry trade' structure where funds are net long high-yielding Italian government bonds while maintaining net short positions in German government bonds. However, as the hiking cycle starts, this pattern disappears. Hedge funds build significant net short positions in *both* assets, shifting from relative value strategies to directional bets on rising yields. Finally, coinciding with

the pivot to rate cuts, the strategy reverts to the pre-hike carry trade structure.

Figure 1: Hedge fund net positions



Note: Euro outstanding volumes. Positive (negative) values indicate net cash borrowing (lending).
Sample period: 2021-01-01 – 2025-11-01

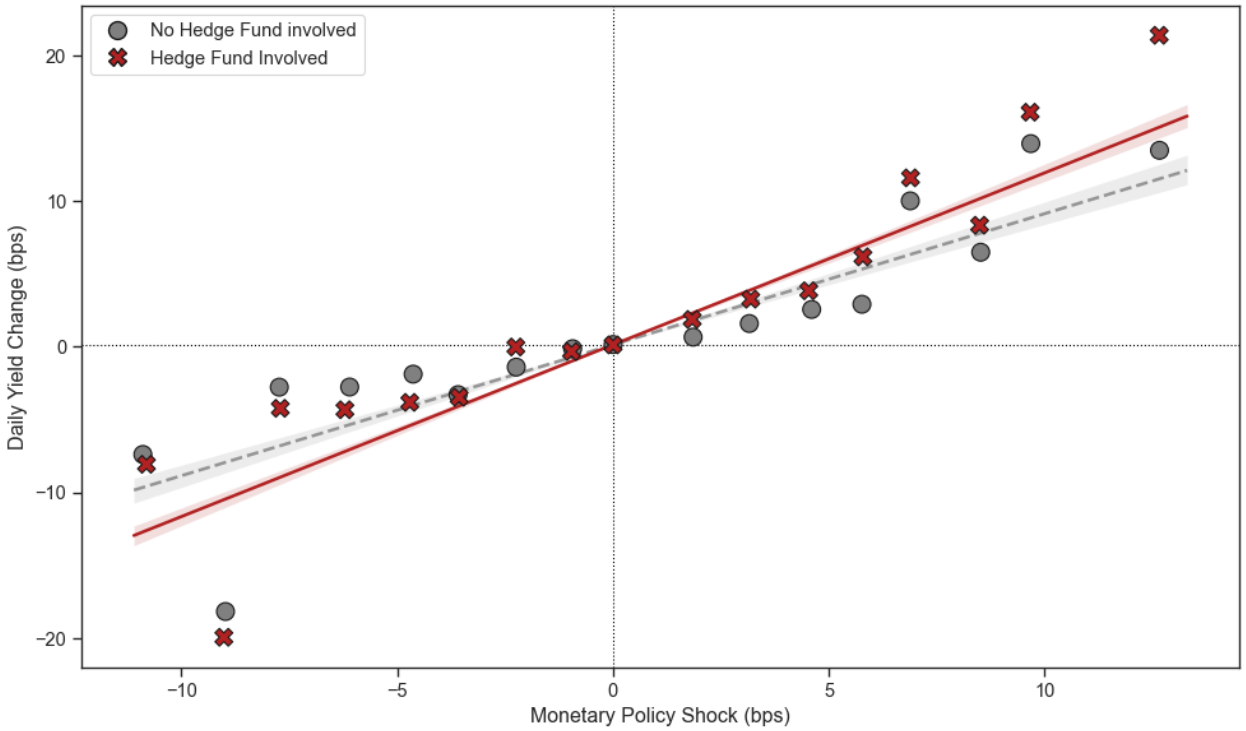
This switching from hedged to directional positioning underscores the importance of considering the state of the policy cycle in the analysis. During the low-rate period, the negative correlation between core and periphery positions implies that hedge funds were acting as spread-arbitrageurs. Conversely, the positive correlation during the hiking cycle implies that hedge funds were following a macro or positive feedback strategy in both markets. Consequently, any empirical framework must explicitly account for this state-dependency to disentangle these two effects.

3.2. Yield Sensitivity

The trading activity of hedge funds, as discussed in Section 3.1, matters for the sensitivity of a bonds yield. To show this, Figure 2 shows a binned scatterplot with monetary policy shocks, measured using benchmark yield changes according to Altavilla, Brugnolini, Gürkaynak, Motto, and Ragusa (2019), on the x-axis and daily yield changes on the y-axis. I then differentiate whether bonds are actively traded by hedge funds.

By definition, the plot results in a positive relationship between the shocks and the yield changes.

Figure 2: Yield sensitivity to monetary policy shocks



Note: Binned scatterplot of daily bond yield changes against monetary policy shocks. Shocks are defined as the change in the sovereign benchmark yield during the ECB press conference window (Altavilla, Brugnolini, Gürkaynak, Motto, and Ragusa, 2019). Yield changes are residualized for bond fixed effects (ISIN). The sample is winsorized and grouped into equal-width bins. Dots represent the conditional means within each bin. Lines represent linear fits estimated on the underlying bond-level data with 95% confidence intervals.
Sample period: 2021-01-01 – 2025-11-01

For bonds that are not traded by hedge funds, the relationship is almost one-to-one, as expected. However, the slope is steeper for bonds that are actively traded by hedge funds. For positive (negative) monetary policy shocks, the yield increase (decrease) is stronger for these bonds. On days where there is no monetary policy shock, there is no difference in the two categories.

The steeper slope for hedge fund-involved bonds suggests an unconditional amplification effect, which I formally test in Section 6.

4. Mechanisms of Yield Amplification

In this section, I am drawing on the literature to explain two channels via which hedge fund positioning can amplify yield volatility.

4.1. Deleveraging

The first mechanism connecting hedge fund trading activity and sovereign bond yields builds on the theory of Brunnermeier and Pedersen (2009); Geanakoplos (2010); Adrian and Shin (2010),

where the interaction between funding liquidity (margin constraints) and market liquidity (price impact) creates a self-reinforcing amplification loop. I now present an example which shows that in a low-haircut environment, even small monetary policy surprises can trigger deleveraging that significantly moves bond yields.

Consider a hedge fund financing a specific bond position via the repo market. To hold this position, the fund must post capital equal to the margin requirement m_i. Since the repo loan principal is fixed, any exogenous price shock $\Delta P_{i,t}$ is absorbed entirely by the capital buffer. The rate of capital erosion depends on the leverage ratio $1/m_i$:

$$\frac{\Delta E_{i,t}}{E_{i,t-1}} \approx \frac{1}{m_i} \times \frac{\Delta P_{i,t}}{P_{i,t-1}} \tag{1}$$

To illustrate the fragility of this constraint, I use representative sample moments. The average monetary policy tightening surprise in the sample is approximately 4 basis points. Regarding leverage, the raw transaction data in Table I shows haircuts averaging 0.24% for long positions. However, these raw figures may understate the true capital committed by funds due to practices such as portfolio margining, netting or unobserved cash buffers (Hempel, Kahn, Mann, and Paddrik, 2023; Hill and Westphal, 2025; Hermes, Schmeling, and Schrimpf, 2025). Therefore, to ensure the calibration is conservative, I assume an effective margin (m_i) of 2%.

Now, consider a hedge fund holding a 10-Year Italian BTP (duration ≈ 8 years) financed via repo under this 2% margin assumption. A positive monetary policy shock of 4 basis points induces a price decline of approximately 0.32% (4 bps $\times$ 8). Substituting these values into Equation (1) reveals the magnitude of the margin pressure:

$$\frac{\Delta E}{E} = \frac{-0.32\%}{2\%} = -16\%$$

Thus, even under this conservative margin assumption, a standard 4 basis point yield move is sufficient to wipe out 16% of the daily margin buffer.

To restore the required margin ratio, the fund must liquidate a portion of the asset holdings. The resulting yield reaction depends on the market's ability to absorb this activity. Let λ denote the inverse market elasticity, meaning how much yields react in response to selling pressure. The additional yield change attributable to deleveraging can be expressed as:

$$\Delta y_{i,t}^{\text{Amp}} = \lambda \times \left(\frac{\Delta E_{i,t}}{E_{i,t-1}} \times \frac{Q_{i,t-1}}{Q_i^{\text{Total}}} \right) \tag{2}$$

where the term in parentheses represents the volume of forced sales normalized by the bond's total amount outstanding.

In this example, I assume the hedge fund sector holds 1% of the bond's total outstanding volume ($Q_{HF}/Q_{Total} = 0.01$), in line with the full sample in Table I. Recall from the previous step that the exogenous price change necessitates liquidating 16% of the position. Consequently, the aggregate selling pressure amounts to:

$$\text{Selling pressure} = 16\% \times 1\% = 0.16\% \text{ of outstanding debt}$$

To quantify the yield impact, I rely on the preferred-habitat literature (Vayanos and Vila, 2021), which posits that demand curves for specific bond maturities are downward sloping. Regarding the specific market elasticity (λ), I choose a conservative 5 basis point calibration based on empirical estimates for US and Euro area sovereign bond markets (D'Amico and King, 2013; Eser and Schwaab, 2016; De Santis and Holm-Hadulla, 2020).

Substituting these parameters into Equation (2) yields the total amplification:

$$\Delta y^{\text{Amp}} = 0.16\% \times 5 \text{ bps} = \mathbf{0.8} \text{ bps}$$

Thus, in this example, the deleveraging triggered by a 4 basis point policy surprise generates sufficient selling pressure to amplify the yield reaction by an additional 0.8 basis points. In terms of price, this implies that the deleveraging triggered by the 32 basis point valuation loss, due to the monetary policy surprise, leads to an additional 6.4 basis point price decline.

4.2. Momentum and Anticipatory Trading

The second mechanism connecting hedge fund trading activity and bond yields builds on two complementary strands of the literature. The first is the empirical finding of Moskowitz, Ooi, and Pedersen (2012) that speculators exhibit "trend-following" behavior, increasing their positions when past returns are positive. The second is the theoretical insight of De Long, Shleifer, Summers, and Waldmann (1990) that rational speculators may not merely follow trends but actively anticipate the positive-feedback trading of other market participants, buying ahead of expected demand and

thereby amplifying the initial price movement.

Thus, while deleveraging helps to understand the connection between hedge fund positions and bond yields when prices move against the position of hedge funds, momentum and anticipatory trading help to understand the connection when prices move in their favor. Unlike deleveraging, both channels reflect active choices to scale exposure rather than forced liquidation.

In this context, monetary policy shocks can trigger two reinforcing responses. Consider a hedge fund holding a short position in a 10-Year Italian BTP. A positive monetary policy shock raises yields and pushes the price of the bond down. The price decline strengthens the momentum signal and validates the short position of the fund. The fund interprets the shock as a confirmation of the macro regime and increases its short exposure further to follow the trend (Moskowitz, Ooi, and Pedersen, 2012). At the same time, sophisticated funds may anticipate that the initial yield increase will trigger additional selling by other leveraged participants — whether through the deleveraging of long holders or through trend-chasing by less informed investors. In the framework of De Long, Shleifer, Summers, and Waldmann (1990), this anticipation creates an incentive to front-run the expected positive-feedback demand, adding to short positions not only because yields have risen but because they are expected to rise further as other participants react. Both responses push yields in the same direction, compounding the amplification beyond what either mechanism would produce in isolation.

For the this channel to generate an equivalent amplification of 0.8 bps as in the deleveraging example, funds would need to scale their positions by 0.16% of outstanding debt (assuming $\lambda = 5$).

The key distinction between the momentum and deleveraging channel is their upper bound. In the case of deleveraging, once the position is liquidated, the selling stops. However, in the case of momentum and anticipatory trading, the position is unrelated to collateral limits. As long as the trend signal is present and capital is available, funds can theoretically scale up positions indefinitely. Indeed, De Long, Shleifer, Summers, and Waldmann (1990) show that such anticipatory behavior can push prices further from fundamentals than they would reach in the absence of rational speculators, precisely because the initial trading by informed participants triggers additional positive-feedback demand from others.

5. Empirical Strategy

5.1. Baseline Specification

To empirically test the amplification mechanism, I employ a panel regression framework that uses monetary policy shocks and cross-sectional variation in hedge fund positioning. Specifically, I am using the shocks provided by Altavilla, Brugnolini, Gürkaynak, Motto, and Ragusa (2019), defined as the change in the country-maturity benchmark yield during the ECB press conference window. This allows me to match each ISIN to its specific benchmark variation, thereby capturing the precise shock relevant to a given bond. While the mechanisms explored in Section 4 are general and apply to any event that causes significant price changes, I focus on monetary policy shocks for two reasons. First, since they are identified using high-frequency intraday windows, they are well-defined and exogenous to other daily bond market factors. Second, the shocks generate enough volatility in bond yields to trigger the discussed mechanisms. Figure 3 validates the latter point by plotting the exceedance probability of daily yield changes. The graph shows that shock days display significant fat-tails, meaning that large yield movements are significantly more likely on days with monetary policy announcements.

My baseline specification estimates the sensitivity of bond yields to monetary shocks conditional on the presence of hedge funds. I estimate the following model:

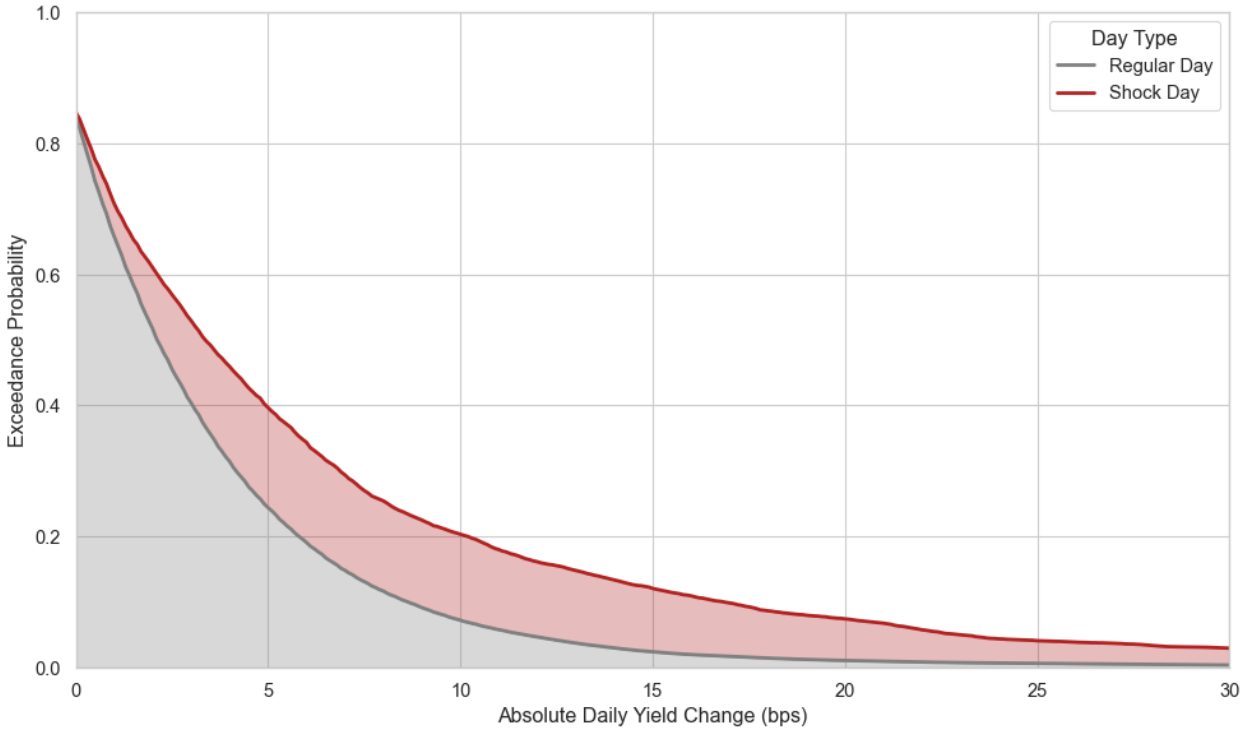
$$\Delta y_{i,t} = \beta_1(\text{HF}_{i,t-1} \times \text{Shock}_{i,t}) + \beta_2 \text{HF}_{i,t-1} + \gamma \mathbf{X}_{i,t-1} + \alpha_i + \delta_t + \varepsilon_{i,t} \tag{3}$$

where the dependent variable, $\Delta y_{i,t}$, is the daily yield change of bond i on day t.

The key explanatory variable is the interaction term $\text{HF}_{i,t-1} \times \text{Shock}_{i,t}$. $\text{Shock}_{i,t}$ represents the bond-specific monetary policy shock. $\text{HF}_{i,t-1}$ measures hedge fund positioning prior to the shock. In the section 6, I use two definitions for the hedge fund positioning. First, I use a binary indicator of hedge fund presence at $t-1$. Second, I employ the average of hedge fund outstanding positions over the prior five trading days scaled by the total amount outstanding, in order to measure the intensity of hedge fund trading.

The inclusion of time fixed effects, δ_t, is critical for identification. These fixed effects absorb all aggregate shocks that affect the entire bond market on a given day, including the direct main effect of the monetary policy surprise itself. Consequently, the coefficient of interest, β_1, identifies the additional sensitivity of hedge fund-owned bonds relative to the market average. A positive β_1

Figure 3: Probability of the Yield Change exceeding a Threshold by Day Type



Note: The figure plots the share of observations where the absolute daily yield change ($|\Delta y|$) is strictly larger than the threshold value displayed on the horizontal axis. The red line represents days with monetary policy announcements, while the gray line represents regular trading days. The shaded region between the curves highlights the excess tail risk generated by monetary policy surprises.
Sample period: 2021-01-01 – 2025-11-01

indicates that bonds with hedge fund participation experience larger yield changes in response to the same shock.

To ensure that β_1 captures the effect of leveraged positioning rather than confounding bond characteristics, the vector $\mathbf{X}_{i,t-1}$ includes bond-specific controls such as the bid-ask spread, the residual maturity, and the status as the CTD bond (Pelizzon, Subrahmanyam, and Tomio, 2025). Additionally, bond fixed effects, α_i, control for time-invariant unobserved heterogeneity across securities, beyond the included control variables. Standard errors are two-way clustered at the bond (ISIN) and date level to account for both serial correlation within bonds and cross-sectional dependence across bonds.

5.2. Identification Strategy

The primary challenge in identifying the causal impact of hedge fund positioning is the endogeneity of their portfolio choice. Hedge funds do not select assets randomly but rather strategically target liquid, on-the-run securities or bonds like the CTD. Consequently, a simple correlation between

ownership and yield levels would mix-up the effect of leveraged capital with the characteristics that make these bonds attractive to arbitrageurs in the first place.

My identification strategy addresses this selection bias by exploiting the unpredictability of monetary policy shocks. The key identifying assumption is that, conditional on fixed effects and bond-specific controls, the interaction between pre-determined hedge fund positioning and the high-frequency surprise is exogenous.

Three features of the research design support this assumption. First is the timing. Because monetary policy shocks are measured over a narrow intraday window, they are effectively random relative to positions established at $t-1$. Hedge funds cannot predict the precise surprise component of the announcement, ensuring that pre-existing positions are not endogenous to the shock itself.

Second, I explicitly account for the fact that hedge funds select specific types of bonds. Since leveraged investors prefer liquid or "special" securities, one might worry that these bonds are inherently more sensitive to volatility. To address this, I include controls for the bid-ask spread, residual maturity, and CTD status. This ensures that the estimated amplification effect is driven by the presence of hedge funds, and not by the liquidity or special status of the underlying asset.

Third, the fixed effects structure isolates the relevant variation. Bond fixed effects remove any permanent differences between securities, while time fixed effects absorb the aggregate market reaction to the shock. Consequently, the regression does not just compare "hedge fund bonds" against "non-hedge fund bonds", but it measures the additional yield reaction of a specific bond relative to the market average, conditional on its hedge fund ownership at that moment.

Finally, if the results were driven solely by unobserved bond characteristics (selection bias), one would expect the presence of hedge funds to capture the effect. However, the deleveraging mechanism implies a that larger positions should trigger larger forced sales. By testing the position size in addition to just the presence of hedge funds, I can verify whether the amplification scales with the size of the position.

6. Empirical Results and Discussion

6.1. Hedge Fund Presence

I begin by examining whether the mere presence of hedge funds creates a differential sensitivity to monetary policy. I estimate the baseline specification using a binary indicator for hedge fund activity:

$$\Delta y_{i,t} = \alpha_i + \delta_t + \beta(HF_Dummy_{i,t-1} \times Shock_{i,t}) + \gamma \mathbf{X}_{i,t} + \varepsilon_{i,t} \tag{4}$$

where $HF_Dummy_{i,t-1}$ is a dummy variable equal to one if bond i has active offshore hedge fund repo positions on day $t-1$.

Crucially, the variable $\text{Shock}_{i,t}$ represents the high-frequency yield adjustment of the maturity-matched benchmark curve for the corresponding country (Altavilla, Brugnolini, Gürkaynak, Motto, and Ragusa, 2019). For example, a German bond with 5 years to maturity is interacted with the intraday response of the 5-year German benchmark yield. This matching ensures that β captures the excess sensitivity of the specific bond relative to its benchmark.

The vector of controls $\mathbf{X}_{i,t-1}$ includes residual bond maturity, bid-ask spreads, and the Cheapest-to-Deliver (CTD) status. Following Pelizzon, Subrahmanyam, and Tomio (2025), I identify the CTD bond using delivery data from Eurex, assuming the delivered bond acts as the CTD security throughout the futures contract life.

Table II presents the estimation results. Across all four specifications, the interaction coefficient of interest (β) is positive, statistically significant at the 1% level, and remarkably stable, ranging from 0.289 to 0.359.

Column (1) reports the unconditional correlation. The interaction coefficient of 0.289 implies that for every 1 basis point increase in the benchmark yield, bonds with hedge fund presence experience an additional yield increase of approximately 0.3 basis points. Column (2) introduces bond-specific controls which barely impacts the magnitude of the coefficient. This suggests that the excess sensitivity is not merely a proxy for a liquidity premium or the special status of the assets.

Column (3) absorbs time-invariant bond characteristics (ISIN FE) and aggregate daily shocks (Time FE). Even within this set-up, the interaction coefficient remains robust at 0.305. This result confirms that the same bond reacts significantly more to an idiosyncratic monetary shock when hedge funds are active in the market than when they are absent.

Column (4) represents the tightest identification. Because the monetary policy shock is defined at the country-maturity-benchmark level, it varies within a given date across ISINs. Standard time fixed effects therefore cannot fully absorb the shock, as evidenced by the significant Shock coefficient in Column (3). To address this, Column (4) replaces the time fixed effects with Benchmark $\times$ Date fixed effects, so the shock main effect is fully absorbed. Identification then relies exclusively on cross-ISIN variation in hedge fund positioning among bonds exposed to the same benchmark

Table II: Baseline Results: Hedge Fund Amplification

Dependent Variable:	**Δ Bond Yield (bps)**			
	(1)	(2)	(3)	(4)
Main Interaction				
HF Dummy × Shock	**0.289*** **	**0.289*** **	**0.305*** **	**0.359*** **
	(0.058)	(0.058)	(0.052)	(0.101)
Direct Effects				
Shock	0.890***	0.890***	0.756***	
	(0.046)	(0.046)	(0.054)	
HF Involved	-0.018	-0.049	-0.088	-0.162**
	(0.025)	(0.052)	(0.058)	(0.073)
Controls				
Residual Bond Maturity		0.006	-0.598	-0.064
		(0.002)	(0.305)	(0.372)
Bid-Ask Spread		0.040	-0.390***	-0.399***
		(0.045)	(0.108)	(0.144)
CTD Flag		0.154*	0.019	0.051
		(0.064)	(0.030)	(0.050)
ISIN FE	No	No	Yes	Yes
Time FE	No	No	Yes	No
Benchmark × Date FE	No	No	No	Yes
Observations	418,928	418,928	418,925	418,902
R-squared	0.011	0.011	0.261	0.355

Notes: The dependent variable is the daily change in bond yield (bps). *HF Involved* is a dummy indicating presence of offshore hedge fund repo activity. *Shock* represents the exogenous market shock. In Column (4), the Shock main effect is absorbed by the Benchmark × Date fixed effects. *Amount Issued* is omitted in columns (3) and (4) due to collinearity with ISIN fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

shock on the same day. Under this tighter specification, the interaction coefficient increases to 0.359. Notably, the direct effect of the HF Dummy becomes significantly negative, indicating that on non-shock days, hedge fund-held bonds exhibit marginally lower yield volatility than other bonds within the same maturity bucket. This is consistent with hedge funds holding the most liquid, large-issue securities, which tend to absorb daily trading flows more smoothly. Crucially, this finding reinforces the identification that hedge fund bonds are not inherently more volatile, but become so specifically when a monetary policy shock interacts with the leveraged positioning.

The estimated amplification is economically substantial. To put the coefficient of 0.305 into perspective, consider the impact of an average four basis point monetary policy tightening surprise. The baseline reaction of a typical bond (captured by the direct Shock coefficient in Column 3) implies a yield change of approximately 0.76×4 bps ≈ 3.0 bps.

For a bond with hedge fund participation, the interaction term adds an excess movement of 0.305×4 bps ≈ 1.2 bps. Consequently, the total yield reaction for hedge fund-held bonds rises

to 4.2 basis points. This implies that the presence of hedge funds in specific bonds accounts for approximately 28% of the total yield movement on shock days. In other words, nearly one-third of the price action in these bonds is driven not by the fundamental news, but by the type of entity trading them.

Two features of the results in Table II argue against alternative explanations driven by selection bias. First, the direct effect of the HF Dummy is either statistically insignificant or, in the tightest specification, significantly negative. In Columns (1) through (3), hedge fund-owned bonds do not exhibit abnormal yield volatility on non-shock days. In Column (4), the negative coefficient indicates that these bonds actually move less than comparable securities within the same maturity bucket, consistent with hedge funds selecting into liquid, deep-market bonds. Crucially, in neither case do hedge fund bonds display higher unconditional volatility.

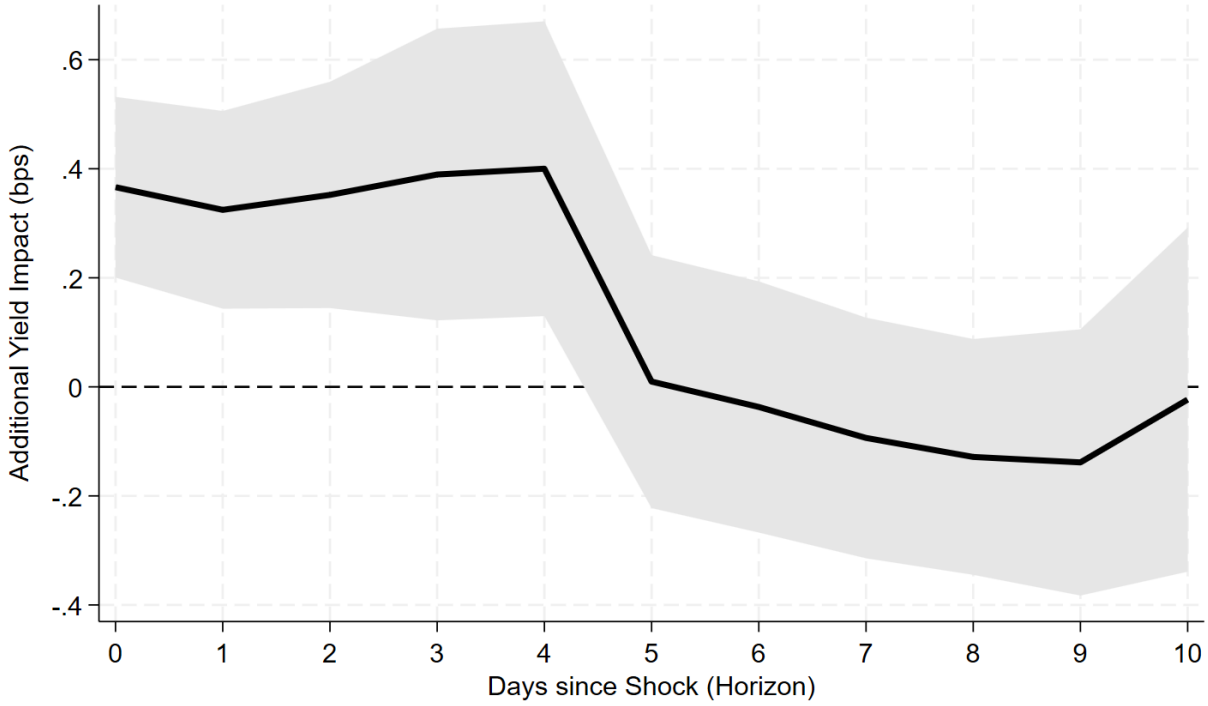
Second, the inclusion of ISIN fixed effects in Columns (3) and (4) ensures that the identification relies purely on time-series variation. The estimate does not simply compare hedge fund traded bonds against non-hedge fund traded bonds. Instead, it compares the reaction of the same bond during periods when hedge funds are active versus periods when they are not. This rules out the concern that time-invariant bond characteristics drive the reaction. Column (4) goes further by absorbing the exact shock realization within each country-maturity-date cell, ensuring that the comparison is made among bonds facing the identical benchmark movement. This rules out the additional concern that bonds mechanically closer to the benchmark yield drive the estimated amplification.

To examine the persistence of this amplification, I estimate the impulse response function using the local projection methodology of Jordà (2005). All local projections employ the Benchmark $\times$ Date fixed effects structure from Column (4) of Table II. Figure 4 plots the estimated interaction coefficient β_h for cumulative yield changes over a horizon of $h = 1$ to $h = 10$ days.

The trajectory provides two key insights into the mechanism. First, the amplification is not a one day event, but rather the yield divergence remains statistically significant and economically elevated for approximately four trading days following the shock. This persistence suggests that the market requires time to absorb the aggregate imbalance generated by forced deleveraging, consistent with theories of slow-moving capital (Duffie, 2010; Mitchell, Pedersen, and Pulvino, 2007).

Second, and crucially, the effect begins to revert after the fourth day, with the difference converging back toward zero. This mean-reverting pattern is characteristic of non-fundamental liquidity shocks (Coval and Stafford, 2007). Unlike fundamental news, the temporary nature of the

Figure 4: Persistence of the amplification



Notes: The figure plots the estimated interaction coefficients β_h from regressions of cumulative yield changes ($\Delta y_{t-1 \to t+h}$) on the interaction between the HF presence dummy and monetary policy shocks. All specifications include ISIN and Benchmark × Date fixed effects. The values represent the differential yield response (in bps) of HF-involved bonds relative to non-HF bonds. Shaded areas denote 90% confidence intervals clustered by date and ISIN.

yield spike confirms that the initial move was driven by transient trading pressure rather than a permanent change in the bond's intrinsic valuation.

6.2. Hedge Fund Intensity

In this section, I extend the analysis beyond the binary presence of hedge funds to examine whether the size of the position amplifies the yield reaction. As outlined in the conceptual framework, the price impact of deleveraging should depend on the volume of trading relative to the total market depth.

To capture this, I construct a continuous measure called Hedge Fund Intensity. For each ISIN-day, I calculate the average absolute net position over the previous five trading days and scale it by the bond's total amount outstanding. This ratio directly measures the percentage of a specific bond held by these offshore hedge funds. The economic rationale is that when hedge funds hold a larger share of a bond's outstanding volume, any forced unwinding of positions will exert greater pressure relative to the market's capacity to absorb it.

Table III: Bond characteristics by hedge fund intensity

HF Intensity buckets	Obs.	BTP Share (%)	Issue Size (€ bn)	Maturity (Years)	Bid-Ask (Spread)	CTD Share (%)
None	188,194	72.8%	10	6.9	0.4918	0.0%
Low	128,141	63.3%	19	8.8	0.1143	2.7%
High	128,110	63.3%	20	6.5	0.0672	9.5%

To motivate the use of a continuous intensity measure, Table III sorts the sample into three categories based on hedge fund positioning: None, Low, and High intensity. These buckets reveal significant heterogeneity across the distribution. Bonds with high hedge fund participation tend to have larger issue sizes and tighter bid-ask spreads, confirming the preference for more liquid securities. Furthermore, bonds with high hedge fund intensity are significantly more likely to be Cheapest-to-Deliver (CTD) issues (9.5%) compared to those with low intensity (2.7%) or those that are not traded by hedge funds at all (0.0%).

These descriptive statistics highlight two critical points for the empirical strategy. First, they underscore the necessity of controlling for bond-specific characteristics, since hedge fund holdings are clearly correlated with liquidity and the special status of CTD bonds. Second, they demonstrate that the intensity of trading matters. A bond that is heavily targeted by hedge funds differs substantially from one with only a marginal position, validating the need to test whether the amplification scales with the size of the exposure.

Table IV presents the estimation results for the intensive margin. Across all four specifications, the interaction coefficient is positive and statistically significant, ranging from 0.014 to 0.025.

Column (1) establishes the baseline relationship. The significant interaction confirms that as hedge fund exposure increases, so does the yield sensitivity to the shock. Crucially, in Column (2), the inclusion of bond-specific controls leaves the coefficient virtually unchanged. This implies that the amplification is not explained by observable differences in liquidity or CTD status. Column (3) absorbs all time-invariant heterogeneity via ISIN fixed effects. The fact that the coefficient remains robust at 0.014 confirms that the result is not driven by the selection of specific bonds, but rather by the time-varying intensity of the leveraged position within the same security. Column (4) replaces the time fixed effects with Benchmark $\times$ Date fixed effects, absorbing the exact shock realization within each country-maturity-date cell. Under this tightest specification, the coefficient increases to 0.025 and becomes significant at the 1% level.

Table IV: Baseline Results: Hedge Fund Intensity

Dependent Variable:	**Δ Bond Yield (bps)**			
	(1)	(2)	(3)	(4)
Main Interaction				
HF Intensity × Shock	**0.016***	**0.016***	**0.014***	**0.025*****
	(0.009)	(0.009)	(0.008)	(0.008)
Direct Effects				
Shock	1.041***	1.041***	0.921***	
	(0.257)	(0.257)	(0.139)	
HF Intensity	-0.018	-0.021	-0.007	-0.011
	(0.013)	(0.015)	(0.009)	(0.009)
Controls				
Residual Bond Maturity		0.006	-0.583	-0.044
		(0.004)	(0.477)	(0.374)
Bid-Ask Spread		-0.004	-0.391***	-0.399***
		(0.083)	(0.141)	(0.144)
CTD Flag		0.238**	0.026	0.059
		(0.119)	(0.040)	(0.051)
ISIN FE	No	No	Yes	Yes
Time FE	No	No	Yes	No
Benchmark × Date FE	No	No	No	Yes
Observations	417,621	417,621	417,621	417,598
R-squared	0.011	0.011	0.260	0.354

Notes: The dependent variable is the daily change in bond yield (bps). *HF Intensity* is a continuous variable representing pre-period hedge fund intensity. *Shock* represents the exogenous market shock. In Column (4), the Shock main effect is absorbed by the Benchmark × Date fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

The results display the same robustness patterns observed in the binary analysis. First, the direct effect of HF Intensity is statistically insignificant across all columns, indicating that bonds with heavier hedge fund positioning do not exhibit abnormal yield volatility on non-shock days. Second, the stability of the coefficient after including controls and fixed effects rules out omitted variable bias from observable characteristics.

Most importantly, this continuous specification offers a stronger identification defense than the binary case. If the amplification were driven merely by the fact that hedge funds select "special" bonds (such as CTD issues), one might expect the effect to be captured fully by the presence of the hedge funds. The finding that yield sensitivity scales with the size of the position implies a mechanical link. The larger the volume of forced trading relative to the outstanding amount, the greater the price dislocation. This relationship is consistent with the deleveraging mechanism and effectively rules out simple selection bias as the driver of the results.

In terms of economic magnitude, consider an average monetary tightening shock of four basis

Table V: Asymmetric Effects: Positive vs. Negative Shocks

Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	**(2) Easing** (Shock ≤ 0)
Main Interaction		
HF Intensity × Shock	**0.033*** **	**0.013**
	(0.008)	(0.012)
Direct Effects		
HF Intensity	-0.013	-0.010
	(0.009)	(0.009)
Controls		
Residual Bond Maturity	-0.091	-0.060
	(0.376)	(0.378)
Bid-Ask Spread	-0.412***	-0.377***
	(0.144)	(0.142)
CTD Flag	0.056	0.044
	(0.051)	(0.050)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,384	411,636
R-squared	0.347	0.346

Notes: This table reports the results of the baseline regression estimated separately for positive shocks (Column 1) and negative shocks (Column 2). The dependent variable is the daily change in bond yield (bps). *HF Intensity* is the pre-period hedge fund intensity. The Shock main effect is absorbed by the Benchmark × Date fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

points and an average hedge fund intensity of 3%. Based on the specification in Column (4) ($\beta = 0.025$), this translates to an additional yield impact of $4 \times 3 \times 0.025 \approx 0.30$ basis points. While this is smaller than the binary estimate, the continuous specification isolates the marginal price pressure per unit of exposure. However, these aggregate results mask significant asymmetries depending on the direction of the shock and the positioning, which I explore in the following subsection.

6.3. Asymmetries

The average intensity result appears modest because it aggregates across opposing states. In fact, the amplification mechanism depends on the interaction between two critical dimensions: the sign of the shock and the direction of the position.

I begin by isolating the first dimension which is the sign of the shock. Since bond prices and yields move inversely, a monetary tightening (positive shock) depresses prices, while an easing (negative shock) increases them. If the mechanism is driven by collateral constraints, the reaction should differ fundamentally depending on whether the sign of the shock.

Table VI: Mechanisms by Position and Shock Type

Position Type	Tightening ($\Delta P < 0$)	Easing ($\Delta P > 0$)
Long Position	*Deleverage*	*Momentum*
Short Position	*Momentum*	*Deleverage*

Notes: This table summarizes the predicted reaction of a leveraged investor. "Deleverage" indicates a scenario where collateral constraints bind, forcing a reduction in position size. "Momentum" indicates a scenario where collateral constraints are relaxed and a trend is confirmed.

Table V presents the results of this analysis. Column (1) reveals that conditional on a tightening surprise, the interaction coefficient doubles to 0.033 and is statistically significant at the 1% level. In contrast, Column (2) shows that for easing shocks, the coefficient is statistically insignificant. This difference suggests that the amplification mechanism is not symmetric.

The second missing dimension is the direction of the position. This refers to whether hedge funds are long or short the bond. Combined with the sign of the shock, this leads to the specific predictions summarized in Table VI.

The logic follows directly from Section 4. A monetary tightening reduces bond prices ($\Delta P < 0$). For long positions, this price decline tightens the margin constraint, necessitating deleveraging. Short positions, however, profit from the price fall and face no such pressure. This shock could be perceived as a signal for a trend resulting in increased short positions. easing shocks ($\Delta P > 0$) present the mirror image. They lead to rising prices, which relax constraints for long positions and might be perceived as trend signal, but force short positions to deleverage as the price moves against them.

To test these predictions, I decompose the aggregate exposure into separate Long Intensity and Short Intensity measures. I calculate these variables as the average absolute net long (or short) position over the prior five trading days, scaled by the bond's total amount outstanding. Table VII presents the results of this decomposition.

The estimates partially confirm the predictions of Table VI. Specifically, I find that amplification is statistically significant for tightening shocks. Long Intensity amplifies the yield increase ($\beta = 0.020$), consistent with the forced liquidation of long positions. Conversely, during easing shocks (Column 2), Short Intensity amplifies the yield decline ($\beta = 0.038$), consistent with the forced covering of short positions. However, here the coefficient is insignificant. These estimates are economically meaningful. For a bond with average hedge fund intensity of 3%, a typical 4 basis point tightening or easing policy surprise generates an excess yield movement of 0.2 to 0.3 basis points, due to this

Table VII: Asymmetric Effects: Long vs. Short HF Intensity

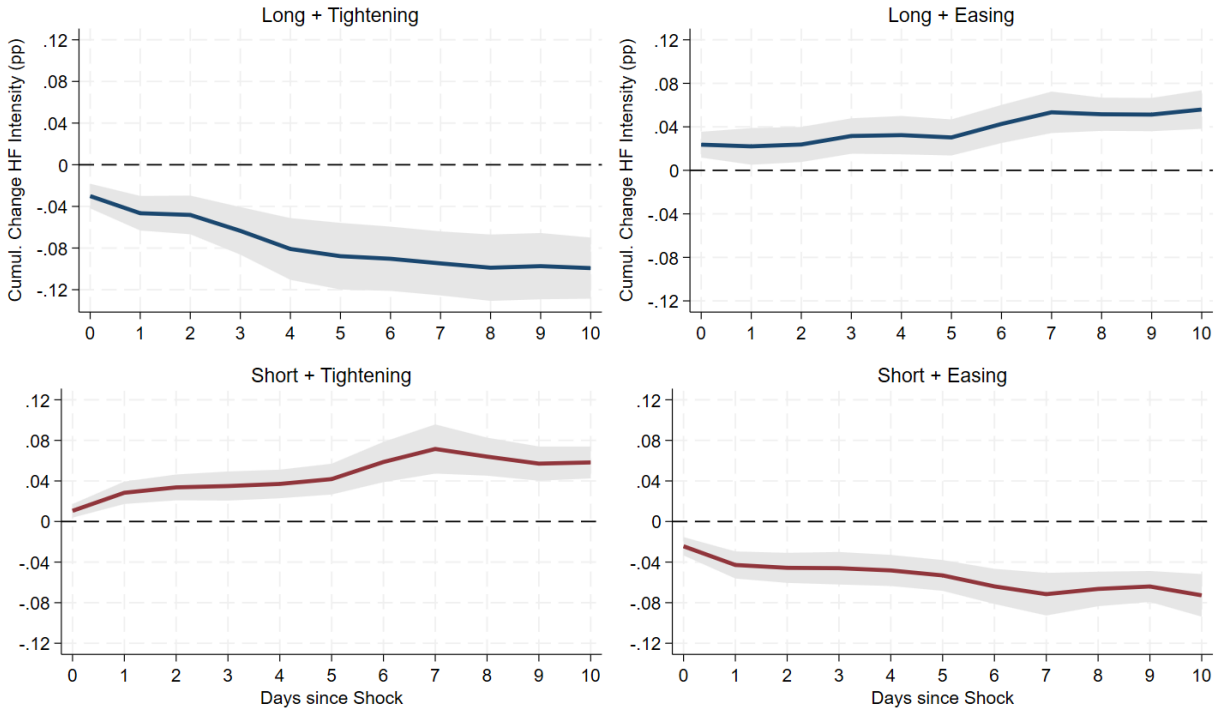
Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	**(2) Easing** (Shock ≤ 0)
Interactions		
HF Intensity (Long) × Shock	**0.020*** **	**-0.006**
	(0.006)	(0.013)
HF Intensity (Short) × Shock	**0.060*** **	**0.038**
	(0.010)	(0.033)
Direct Effects		
HF Intensity (Long)	-0.004	-0.003
	(0.013)	(0.014)
HF Intensity (Short)	-0.027***	-0.021**
	(0.009)	(0.009)
Controls		
Residual Bond Maturity	-0.095	-0.062
	(0.376)	(0.377)
Bid-Ask Spread	-0.405***	-0.371***
	(0.144)	(0.143)
CTD Flag	0.048	0.037
	(0.051)	(0.051)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,920	412,174
R-squared	0.347	0.346

Notes: This table reports results distinguishing between Long and Short hedge fund intensity. Column (1) includes observations with positive market shocks, and Column (2) includes observations with negative market shocks. The dependent variable is the daily change in bond yield (bps). The Shock main effect is absorbed by the Benchmark × Date fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

deleveraging channel.

The strongest effect in Table VII, however, is when tightening shocks relax constraints. The interaction between Short Intensity and tightening shocks yields a large, positive coefficient of 0.060. Since short positions profit from the price declines associated with monetary tightening, these positions face no pressure to deleverage. Instead, this amplification is consistent with the momentum and anticipatory trading mechanisms outlined in Section 4.2. Given that my sample period covers an aggressive monetary hiking cycle, a tightening surprise confirms the macro trend, prompting hedge funds to add to their winning short positions. Moreover, sophisticated funds may increase their short exposure not only in response to realized gains but in anticipation that the initial yield rise will trigger further selling by other market participants (De Long, Shleifer, Summers, and Waldmann, 1990). The fact that this coefficient is roughly three times larger than the deleveraging effect for long positions (0.020) is consistent with this compounding logic, where active position-building amplifies

Figure 5: Impulse responses of hedge fund intensity to monetary policy shocks (overnight)



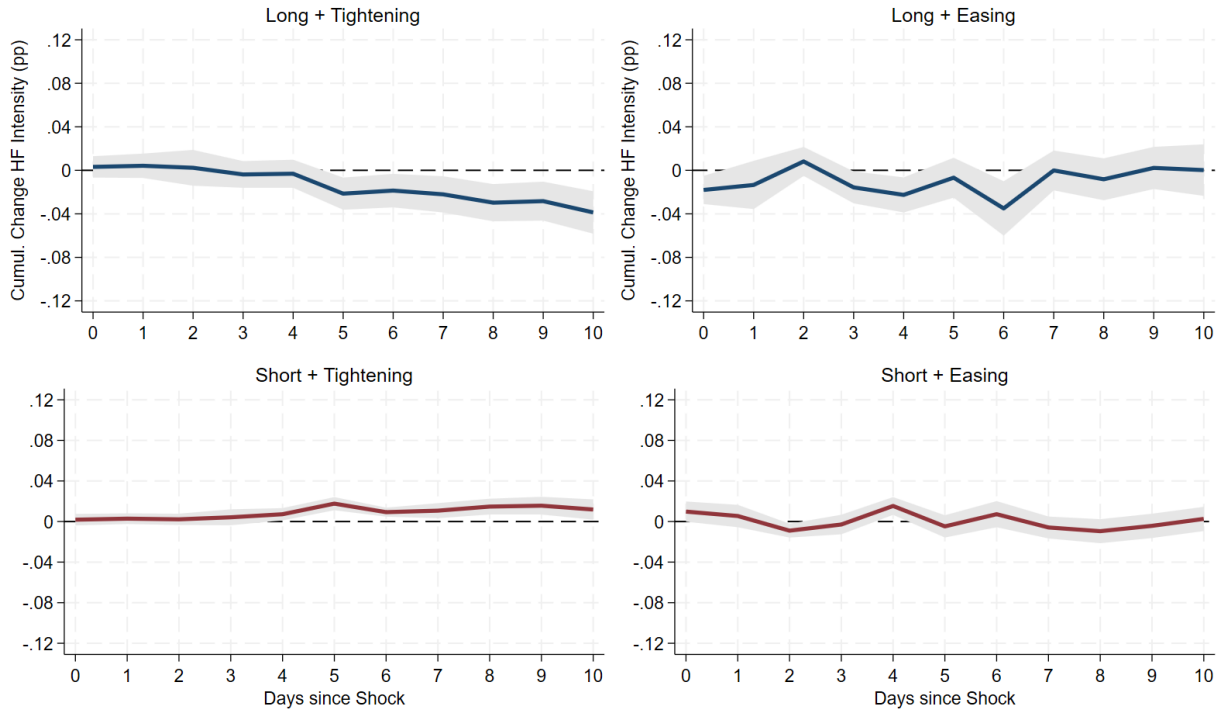
Note: Dependent variable is the cumulative change in HF Intensity (pp) from $t-1$ to $t+h$. Intensity is measured as % of amount issued. Sample restricted to overnight repo transactions. All specifications include Business Date and ISIN Fixed Effects. Standard errors clustered by date and ISIN. Shaded areas denote 90% confidence intervals. Sample period: 2021-01-01 – 2025-11-01

yields more than forced liquidation alone. While this reasoning theoretically applies symmetrically to long positions during easing shocks, the easing cycle in this sample is significantly shorter and less intense, limiting the scope for momentum and anticipatory trading in that direction.

To test this hypothesis, I estimate the cumulative response of hedge fund intensity using local projections (Jordà, 2005). This approach allows me to distinguish quantity adjustments driven by deleveraging pressures from those driven by macro strategies. Specifically, positions affected by deleveraging pressures (longs during tightening and shorts during easing) should contract. Conversely, positions that are benefiting from the shock (shorts during tightening and longs during easing) should expand if funds interpret the shock as a signal to increase directional exposure.

Figures 5 and 6 present the impulse responses of hedge fund intensity to monetary policy shocks. In this analysis, it is essential to distinguish between the maturities of the underlying repo contracts. Overnight positions allow for immediate adjustment, as they roll over daily. In contrast, term repo transactions are contractually locked until maturity, constraining the fund's ability to deleverage instantly. Consequently, one would expect term positions to adjust either with a lag or not at all,

Figure 6: Impulse responses of hedge fund intensity to monetary policy shocks (term)



Note: Dependent variable is the cumulative change in HF Intensity (pp) from $t-1$ to $t+h$. Intensity is measured as % of amount issued. Sample restricted to term repo transactions. All specifications include Business Date and ISIN Fixed Effects. Standard errors clustered by date and ISIN. Shaded areas denote 90% confidence intervals. Sample period: 2021-01-01 – 2025-11-01

provided the necessary deleveraging can be fully absorbed by the overnight positions.

The observed patterns in the overnight segment (Figure 5) support the hypothesis. Consistent with the deleveraging mechanism outlined in Section 4, the cumulative change in hedge fund intensity is negative for long positions during tightening and short positions during easing, which are the two states where the shock moves prices against the position.

Conversely, in the states where the shock is profitable (short positions during tightening and long positions during easing) the opposite pattern emerges. Rather than reducing exposure, hedge funds actively increase their positioning. This expansion suggests a momentum or anticipatory trading strategy, where investors reinforce their bets when the policy surprise confirms the direction of their trade.

Figure 6 presents the results for the term repo segment. The patterns follow the overnight analysis but are reduced and delayed. For long positions during a tightening shock, deleveraging is evident but begins with a lag of approximately five days. This delay is mechanically consistent with the maturity profile of these contracts. The descriptive statistics in Table I show that the

25th percentile of the long maturity distribution is 6.3 days. Thus the observed lag corresponds roughly to the point where the first quartile of contracts begins to mature and reprice. In contrast, short positions during easing shocks show no material adjustment, suggesting that the immediate flexibility of the overnight segment is sufficient to satisfy deleveraging requirements without altering term funding.

On the momentum side, short positions during tightening shocks also exhibit delayed trend-following behavior, appearing after the same five-day interval. For long positions during easing, no clear trend is observable. Overall, the results are more pronounced for tightening shocks, likely reflecting the unprecedented speed and magnitude of the hiking cycle in the sample period.

6.4. Core-Periphery

Beyond the sign of the shock and the direction of the position, a third critical asymmetry is the distinction between core and periphery issuers. As illustrated in Figure 1, hedge fund strategies are dynamic. At times, funds position themselves in opposite directions to execute spread-convergence or carry trades. At other times, they hold the same directional positions across both markets, indicative of broad momentum strategies.

Analyzing the dynamics of the core-periphery spread is critical for at least three reasons. First, the spread serves as a barometer of market sentiment, summarizing perceptions of fiscal sustainability and credit risk. Second, yield divergence impairs the uniform transmission of monetary policy. If the same policy action generates asymmetric financial conditions across member states, it creates fragmentation risks that complicate the implementation of a single monetary policy. Tools such as the ECB's Transmission Protection Instrument (TPI) have been used to address this. Third, spread volatility poses direct financial stability risks. A widening spread increases funding costs for exposed banks and reduces collateral values, potentially triggering margin spirals that propagate stress throughout the financial system.

To study the differential impact of positioning in the core and periphery, I employ a triple-interaction framework, interacting the hedge fund intensity measures with a periphery Dummy (equal to one for Italian bonds) and the monetary policy shock. In this specification, the "base" coefficients capture the sensitivity of core (German) bonds, while the triple interactions capture the additional amplification specific to the periphery.

Table VIII presents the results. Focusing first on the core, long positions exhibit significant

Table VIII: Core and Periphery Effects

Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	**(2) Easing** (Shock ≤ 0)
Core Sensitivity (Base)		
HF Intensity (Long) × Shock	**0.027*** **	-0.003
	(0.006)	(0.008)
HF Intensity (Short) × Shock	**0.026*** **	0.005
	(0.007)	(0.012)
Periphery Amplification (Additional)		
HF Intensity (Long) × Shock × Periphery	-0.006	-0.002
	(0.008)	(0.014)
HF Intensity (Short) × Shock × Periphery	**0.067*** **	**0.046**
	(0.021)	(0.034)
Other Estimates		
HF Intensity (Long) × Periphery	-0.018	-0.018
	(0.020)	(0.020)
HF Intensity (Short) × Periphery	-0.008	-0.001
	(0.017)	(0.017)
HF Intensity (Long)	0.011	0.012
	(0.012)	(0.012)
HF Intensity (Short)	-0.021**	-0.020**
	(0.010)	(0.010)
Controls		
Residual Bond Maturity	-0.109	-0.059
	(0.376)	(0.377)
Bid-Ask Spread	-0.405***	-0.371***
	(0.144)	(0.143)
CTD Flag	0.039	0.030
	(0.051)	(0.051)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,920	412,174
R-squared	0.347	0.346

Notes: This table presents a triple-difference specification interacting Hedge Fund Intensity with the market shock and a periphery country dummy. "Core Sensitivity" reports the base effects (Non-periphery). "Periphery Amplification" reports the triple interaction terms representing the additional effect for periphery bonds. The *Periphery Dummy*, *Shock*, and *Shock* × *Periphery* main effects are absorbed by the Benchmark × Date and ISIN fixed effects. Standard errors are clustered by date and ISIN. *** p<0.01, ** p<0.05, * p<0.10.

deleveraging pressure during tightening shocks, with a coefficient of 0.027. Short positions in the core also amplify tightening shocks (coefficient 0.026), confirming that trend-following or anticipatory behavior is present even in safe assets. However, short positions in German bonds do not appear to deleverage during easing shocks (coefficient 0.005, insignificant). This asymmetry is consistent with the structural role of German bonds in hedge fund portfolios. As shown in Appendix A, short positions in the core frequently serve as hedges for long positions in the periphery rather than as

standalone directional bets. Consequently, these hedging legs are not unwound in isolation during an easing shock.

Turning to the periphery interactions, it is crucial to interpret the coefficients as the *additional* yield sensitivity of Italian bonds relative to the German baseline. First, for long positions during tightening, the interaction term is statistically insignificant. This implies that the deleveraging pressure observed in the core is symmetric, implying that Italian bonds experience the same degree of forced selling as German bonds, resulting in no net change in the core-periphery spread.

In contrast, short positions drive significant divergence. The most economically significant dislocation occurs in short positions during tightening shocks (Momentum). The large positive coefficient (0.067) indicates that yield spikes are drastically amplified for Italian bonds. This confirms that hedge funds significantly add to short periphery positions when rates rise. The effect is economically large. For an average four basis point shock and 3% hedge fund intensity, this asymmetry adds approximately 0.8 basis points to the core-periphery spread. During easing shocks, the triple interaction coefficient for short positions is positive and of similar magnitude (0.046), suggesting that the buying pressure from covering short positions is more acute in the periphery, causing the core-periphery spread to compress. However, this estimate is not statistically significant under the tightest identification, likely reflecting the shorter and less intense easing cycle in the sample which limits statistical power.

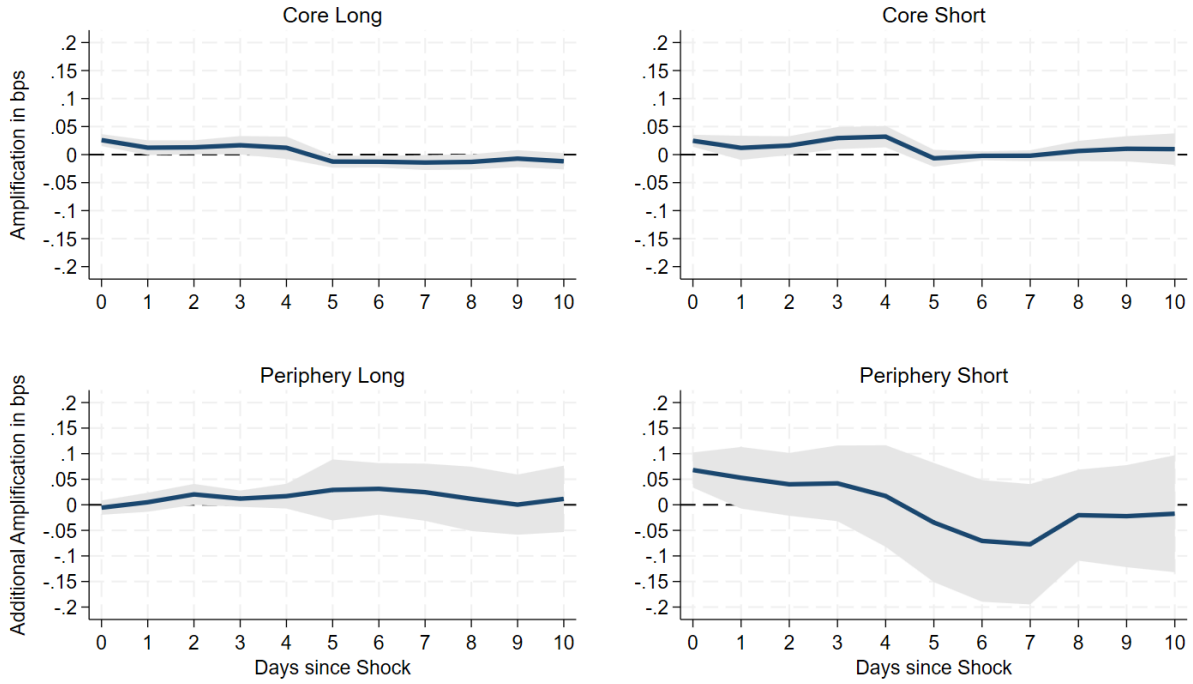
To determine whether these patterns generate lasting market fragmentation, I examine the persistence of the effects using local projections (Jordà, 2005). Figures 7 and 8 plot the cumulative yield response for tightening and easing shocks, respectively.

The results clarify that the persistence of the amplification differs across positions and issuers, with important implications for the distinction between yield levels and spreads.

As shown in Figure 7, the amplification of core positions remains elevated for approximately four days following a tightening shock. This persistence suggests that the general level of yields is pushed higher for an extended period, consistent with theories of slow-moving capital where intermediaries face frictions in mobilizing the capital required to absorb large directional flows (Mitchell, Pedersen, and Pulvino, 2007; Coval and Stafford, 2007; Duffie, 2010).

In contrast, the additional amplification of periphery short positions is concentrated on the impact day and the day immediately after, reverting more quickly than the core effects. This implies that while momentum trading in short periphery positions drives a temporary wedge between core

Figure 7: Persistence of Amplification (Tightening)



Note: Dependent variable is the cumulative change in bond yields (bp) from $t-1$ to $t+h$. All specifications include Business Date and ISIN Fixed Effects. Standard errors clustered by date and ISIN. Shaded areas denote 90% confidence intervals. Sample period: 2021-01-01 – 2025-11-01

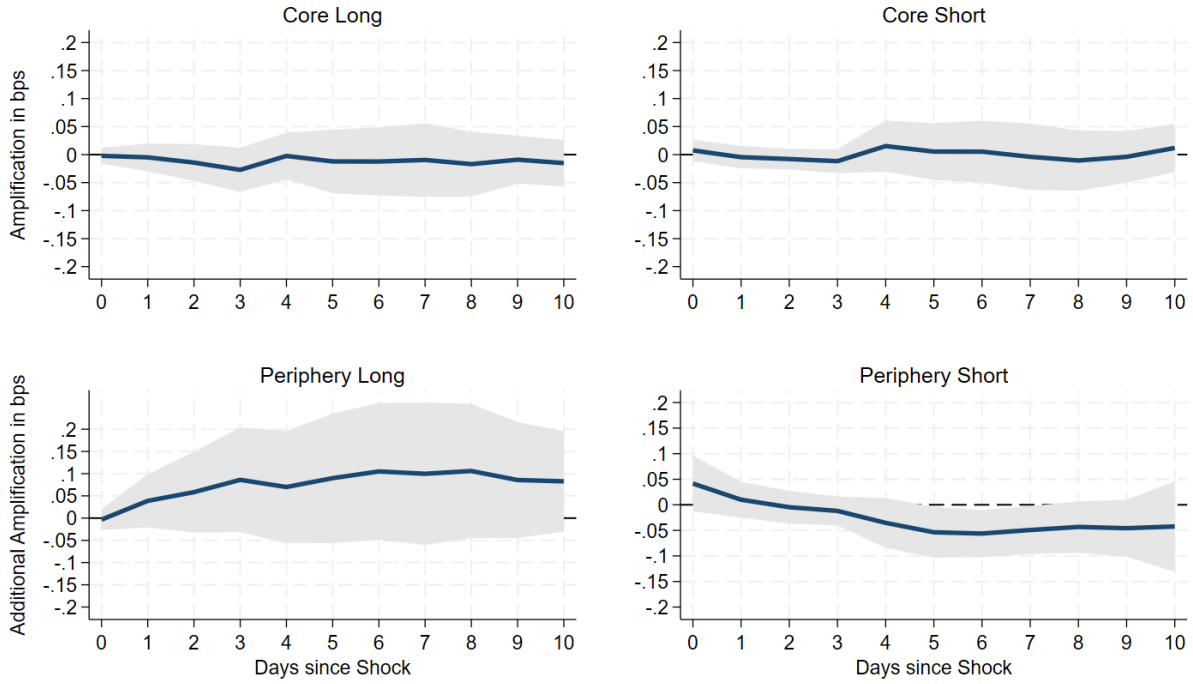
and periphery yields, this spread dislocation is short-lived relative to the broader yield amplification. For easing shocks (Figure 8), the effects are largely insignificant, consistent with the results in Table VIII.

7. External Validity: US Treasury Markets

The analysis so far has established that offshore hedge funds amplify sovereign bond yields in the euro area. In this section, I test for external validity of the amplification channel, by studying the US Treasury market, which is the largest and most liquid sovereign bond market in the world and a market where offshore hedge fund activity has attracted significant attention (Barth, Beltran, Hoops, Kahn, Liu, and Perozek, 2025; Barth and Kahn, 2025; Kruttli, Monin, Petrasek, and Watugala, 2025).

The SFTDS data captures a subset of offshore Hedge Funds' US Treasury repo activity because euro area banks act as global banks which means their activity is captured in the data. Thus, I construct a parallel dataset from the SFTDS that isolates USD-denominated repo transactions

Figure 8: Persistence of amplification (easing)



Note: Dependent variable is the cumulative change in bond yields (bp) from $t-1$ to $t+h$. All specifications include Business Date and ISIN Fixed Effects. Standard errors clustered by date and ISIN. Shaded areas denote 90% confidence intervals. Sample period: 2021-01-01 – 2025-11-01

collateralized by US Treasury securities. The identification of offshore hedge fund activity follows the same approach as in the euro area analysis, meaning I select counterparties domiciled in the Cayman Islands classified as investment funds. For the shocks, I make use of the monetary policy shocks of Jarociński and Karadi (2020). The regression specification mirrors the euro area baseline:

$$\Delta y_{i,t} = \alpha_i + \delta_t + \beta(\text{HF Dummy}_{i,t-1} \times \text{Shock}_{i,t}) + \gamma \mathbf{X}_{i,t} + \varepsilon_{i,t} \tag{5}$$

Table IX presents the results. Column (1) estimates the baseline specification on the full sample. In stark contrast to the euro area findings, the interaction coefficient is economically small and statistically insignificant. This suggests that the amplification channel does not operate in US Treasury markets. However, this aggregate result masks an important structural difference between the two markets relating to the prevalence of the cash-futures basis trade.

The cash-futures basis trade involves simultaneously purchasing a bond and selling the corresponding futures contract, profiting from the convergence of the cash-futures spread at delivery. Crucially, this strategy is hedged by construction. Because the cash leg is offset by the short

futures leg, a monetary policy shock that reduces the value of the bond collateral simultaneously generates an offsetting gain on the futures contract. Consequently, the margin pressure that drives the deleveraging mechanism as well as the signal driving momentum trading documented in Section 4 is neutralized. This trade has grown substantially since mid-2022, becoming one of the dominant strategies employed US Treasury markets (Barth, Beltran, Hoops, Kahn, Liu, and Perozek, 2025; Avalos and Sushko, 2023).

This observation generates two testable predictions. First, the amplification channel should be operative in the period before the basis trade became prevalent, when hedge funds were following different strategies than the basis trade. Second, the amplification should be present in bonds where basis trades are unlikely, regardless of the time period.

Columns (2) and (3) test the first prediction by splitting the sample around June 2022. This is because according to Barth and Kahn (2025), the basis trade is subdued between January 2021 and June 2022, and picks up afterwards. Column (2) restricts the analysis to the period before the basis trade became widespread. In this subsample, the interaction coefficient is positive, statistically significant, and economically meaningful at 0.287. This implies that when hedge fund positions in US Treasuries were largely unrelated to the basis trade, the same amplification channel that operates in the euro area was active. Column (3) shows that this effect disappears entirely in the post-June 2022 period, consistent with the hypothesis that hedged basis trade positions mute the amplification mechanism.

Columns (4) through (6) test the second prediction using cross-sectional variation in the likelihood of basis trades. The basis trade requires a futures contract against which to hedge. Thus, bonds that are not part of any futures delivery basket are unlikely to be used for this strategy. Column (4) restricts the sample to non-deliverable bonds with a residual maturity of three years or less. These bonds cannot be used for delivery in any futures contract. In this segment, the interaction coefficient is positive and significant at the 10% level (0.214), confirming that the amplification channel operates where basis trades are structurally unlikely.

Column (5) presents the complementary test. When the sample is restricted to bonds that are deliverable into futures contracts, the interaction coefficient is economically small and statistically insignificant. This contrast between Columns (4) and (5) provides cross-sectional evidence that is independent of the time-series sample split and reinforces the conclusion that hedged positions do not amplify yields.

Table IX: US Treasuries: Hedge Fund Amplification and Basis Trades

Dependent Variable:	**Δ Bond Yield (bps)**					
	(1) Full Sample	(2) Pre 2022-06	(3) Post 2022-06	(4) Non-Del. ≤ 3Y	(5) Del. All	(6) Del. ≤ 3Y
Main Interaction						
HF Dummy × Shock	0.018	**0.287****	−0.020	**0.214***	−0.047	−0.010
	(0.112)	(0.117)	(0.122)	(0.119)	(0.096)	(0.018)
Direct Effects						
HF Dummy	0.018	−0.085	0.026	0.042	0.000	0.002
	(0.034)	(0.065)	(0.041)	(0.043)	(0.027)	(0.014)
Controls						
Residual Bond Maturity	0.715*	−0.338	1.086**	1.652***	−0.024	−0.037
	(0.399)	(0.677)	(0.479)	(0.337)	(0.455)	(0.094)
Bid-Ask Spread	0.120	0.568	0.483	0.865	0.564	−0.425
	(0.784)	(1.837)	(1.216)	(1.911)	(1.322)	(0.561)
CTD Flag	0.014	−0.172	0.009		0.094	0.015
	(0.028)	(0.110)	(0.026)		(0.083)	(0.011)
ISIN FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	425,852	108,255	317,940	162,047	109,984	24,128
R-squared	0.571	0.535	0.579	0.325	0.872	0.994

Notes: The dependent variable is the daily change in bond yield (bps). *HF Dummy* is a binary indicator of offshore hedge fund repo activity. *Shock* is the median monetary policy surprise. Column (1) reports the full sample. Columns (2) and (3) split the sample around June 2022, when the Treasury basis trade became prevalent. Column (4) restricts to non-deliverable bonds with residual maturity ≤ 3 years, where basis trades are structurally impossible. Column (5) includes only bonds deliverable into futures contracts. Column (6) further restricts the deliverable sample to bonds with residual maturity ≤ 3 years. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

A potential concern with this comparison is that non-deliverable short-maturity bonds may simply be more sensitive to monetary policy due to their proximity to the policy rate. To address this, Column (6) restricts the deliverable sample to bonds with the same short maturity (three years or less). Despite operating in the same maturity range as the non-deliverable bonds in Column (4), these deliverable short-maturity bonds show no amplification. This result confirms that the differential sensitivity documented in Column (4) is driven by the nature of the hedge fund position rather than by the maturity of the underlying bond.

Taken together, these results demonstrate that the amplification mechanism documented in this paper is not specific to the euro area but rather a general feature of leveraged directional positioning in sovereign bond markets. Where hedge funds hold exposure that is not perfectly offset, they amplify yield reactions to monetary policy shocks. This includes the core-periphery carry trade documented in Section 3, where the long and short legs reference different sovereigns with distinct risk profiles, leaving residual exposure to spread movements. Where positions are hedged against

the same underlying, as in the Treasury basis trade, the mechanism is neutralized. This finding has implications beyond the immediate scope of this paper. It suggests that the basis trade, despite the systemic risks it poses through other channels (Barth and Kahn, 2025; Kashyap, Stein, Wallen, and Younger, 2025), may paradoxically dampen one specific source of yield volatility by ensuring that leveraged positions carry an offsetting hedge.

8. Conclusion

This paper uses a novel transaction-level dataset (SFTDS) to demonstrate a causal non-bank amplification channel in sovereign bond markets. The analysis shows that whether hedge funds amplify sovereign bond yields depends on two features of their positioning. The first is the direction of the position relative to the shock, which determines whether deleveraging or momentum trading is activated and shapes the nature of the amplification. Long positions primarily amplify the general level of yields, raising broad funding costs without affecting the core-periphery spread. Short positions, in contrast, drive differential responses across issuers, temporarily widening the spread between core and periphery yields and thereby impairing the uniform transmission of monetary policy.

The second feature is the structure of the hedge. The extension to US Treasury markets demonstrates that the amplification channel is not specific to the euro area but a general consequence of leveraged directional positioning. At the same time, the absence of amplification in bonds where hedge fund positions are hedged via the basis trade reveals that the channel requires exposure that is not perfectly offset. This distinction carries implications beyond the two markets studied here. Positions of identical size can have fundamentally different consequences for yield volatility depending on whether they carry residual directional exposure.

These findings speak to the broader question of whether hedge funds stabilize or destabilize financial markets. The answer is conditional. The same entities that compress spreads through relative value trading in one environment can amplify yield dislocations in another. Assessing the risks from hedge fund activity therefore requires granular information on both the nature of the positions and the strategies in which they are embedded.

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Appendix for
"Offshore Hedge Funds and Sovereign Risk Spreads"

Felix Hermes

Abstract

This paper investigates how the leveraged positioning of offshore hedge funds amplifies sovereign bond yield volatility. Combining granular regulatory transaction-level data on repo positions with high-frequency monetary policy surprises, I document a causal non-bank amplification channel. The analysis yields four key results. First, hedge fund presence significantly increases yield sensitivity to policy shocks. An average four basis point surprise raises yields by an additional 1.2 basis points. Second, this effect scales with the intensity of hedge fund positioning relative to the bond's issue size. Third, the transmission is asymmetric and state-dependent. While easing shocks have a limited impact, tightening shocks induce deleveraging in long positions and directional momentum trading in short positions. Fourth, this amplification has an impact on market fragmentation. Specifically, an average four basis points tightening shock temporarily widens the core-periphery spread by approximately one basis point. Finally, I show that the mechanism generalizes across sovereign bond markets wherever hedge funds hold directional exposure, but is neutralized when leveraged positions carry a near-perfect hedge against the same underlying.

A. German government bonds as hedges

Table A1: Short positions in German government bonds as a hedge

Dep. Variable:	(1)	(2)	(3)	(4)	(5)
	Δ HF Short (DE)			**Δ HF Long (DE)**	
Δ HF Long (IT)	0.313*			0.037	
	(0.180)			(0.057)	
Δ HF Short (IT)		0.348*			-0.037
		(0.200)			(0.052)
Δ HF Long (DE)			-0.600		
			(0.454)		
Observations	962	962	962	962	962
R-squared	0.083	0.187	0.089	0.005	0.009
Constant	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses. * p<0.1. Variables are in first differences of daily aggregate intensities. The correlation between Italian shorts and longs is 0.5, which is why regressions are presented individually to avoid multicollinearity.

Table A1 shows time series regressions showing the relation between the net positions in German and Italian government bonds by offshore hedge funds. It can be observed that the net short positions in German government bonds move together with the net long and short positions in Italian government bonds, whereas the same is not the case for long positions in German government bonds or even between long and short positions in German government bonds.

The relationship between short positions in German government bonds and long positions in Italian government bonds likley stems from the German leg acting as a hedge for the Italian leg. This is in line with a core-periphery carry trade. The relationship with net short positions in Italian government bonds likley stems from a general momentum trade during the monetary policy hiking cycle.

B. Robustness

B1. OIS shocks

Tables B1, B2, and B3 address the concern that the benchmark shock measure may be mechanically correlated with the dependent variable, since individual ISINs contribute to their respective benchmarks. To rule out that the amplification results are driven by this proximity, I replace the benchmark shock with shocks based on the 2-year OIS rate during the ECB press conference window. Unlike the benchmark yield, the OIS rate is a pure risk-free rate measure that is independent of any specific sovereign bond. The results are qualitatively consistent with the main findings. The binary and intensity interactions remain significant, the asymmetry between tightening and easing shocks is preserved, and the long-short decomposition confirms that short positions drive the strongest amplification during tightening. In the core-periphery decomposition, the core effects remain significant, while the periphery triple interactions lose some precision, likely reflecting the fact that the OIS shock does not vary across countries and thus provides less variation to identify the triple interaction.

Table B1: Robustness: OIS-Based Monetary Policy Shocks

Dependent Variable:	**Δ Bond Yield (bps)**			
	(1)	(2)	(3) Tightening (Shock ≥ 0)	(4) Easing (Shock ≤ 0)
Main Interaction				
HF Dummy × OIS Shock	0.277**			
	(0.124)			
HF Intensity × OIS Shock		0.021***	0.022**	0.017**
		(0.007)	(0.009)	(0.008)
Direct Effects				
HF Dummy	-0.163**			
	(0.073)			
HF Intensity		-0.011	-0.012	-0.010
		(0.009)	(0.009)	(0.009)
Controls				
Residual Bond Maturity	-0.054	-0.048	-0.091	-0.060
	(0.372)	(0.373)	(0.377)	(0.377)
Bid-Ask Spread	-0.404***	-0.399***	-0.413***	-0.377***
	(0.144)	(0.144)	(0.144)	(0.142)
CTD Flag	0.053	0.062	0.059	0.044
	(0.050)	(0.051)	(0.051)	(0.050)
ISIN FE	Yes	Yes	Yes	Yes
Benchmark × Date FE	Yes	Yes	Yes	Yes
Observations	418,902	417,598	411,384	411,636
R-squared	0.355	0.354	0.347	0.346

Notes: This table replicates the main specifications using the 2-year OIS rate change during the ECB press conference window as the monetary policy shock, instead of the country-maturity benchmark yield change. Column (1) corresponds to Column (4) in Table II, Column (2) to Column (4) in Table IV, and Columns (3) and (4) to Columns (1) and (2) in Table V. The OIS Shock main effect is absorbed by the Benchmark × Date fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B2: Robustness: OIS-Based Shocks, Long vs. Short HF Intensity

Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	(2) Easing (Shock ≤ 0)
Interactions		
HF Intensity (Long) × OIS Shock	0.014***	0.007
	(0.004)	(0.009)
HF Intensity (Short) × OIS Shock	0.038**	0.035
	(0.016)	(0.024)
Direct Effects		
HF Intensity (Long)	-0.004	-0.002
	(0.013)	(0.014)
HF Intensity (Short)	-0.025***	-0.022**
	(0.009)	(0.009)
Controls		
Residual Bond Maturity	-0.097	-0.063
	(0.376)	(0.376)
Bid-Ask Spread	-0.407***	-0.371***
	(0.144)	(0.143)
CTD Flag	0.054	0.038
	(0.052)	(0.051)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,920	412,174
R-squared	0.347	0.346

Notes: This table replicates the long vs. short decomposition using the 2-year OIS rate change during the ECB press conference window as the monetary policy shock. Columns (1) and (2) correspond to Columns (1) and (2) in Table VII, respectively. The OIS Shock main effect is absorbed by the Benchmark × Date fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B3: Robustness: OIS-Based Shocks, Core and Periphery Effects

Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	(2) Easing (Shock ≤ 0)
Core Sensitivity (Base)		
HF Intensity (Long) × OIS Shock	0.029*	-0.008
	(0.017)	(0.007)
HF Intensity (Short) × OIS Shock	0.024***	0.003
	(0.007)	(0.012)
Periphery Amplification (Additional)		
HF Intensity (Long) × OIS Shock × Periphery	-0.015	0.019**
	(0.017)	(0.010)
HF Intensity (Short) × OIS Shock × Periphery	0.029	0.047*
	(0.033)	(0.027)
Other Estimates		
HF Intensity (Long) × Periphery	-0.019	-0.017
	(0.019)	(0.020)
HF Intensity (Short) × Periphery	-0.005	-0.002
	(0.017)	(0.016)
HF Intensity (Long)	0.011	0.012
	(0.012)	(0.012)
HF Intensity (Short)	-0.021**	-0.020**
	(0.010)	(0.010)
Controls		
Residual Bond Maturity	-0.103	-0.062
	(0.377)	(0.376)
Bid-Ask Spread	-0.407***	-0.370***
	(0.145)	(0.143)
CTD Flag	0.046	0.030
	(0.051)	(0.051)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,920	412,174
R-squared	0.347	0.346

Notes: This table replicates the core-periphery decomposition using the 2-year OIS rate change during the ECB press conference window as the monetary policy shock. Columns (1) and (2) correspond to Columns (1) and (2) in Table VIII, respectively. The OIS Shock, OIS Shock × Periphery, and Periphery main effects are absorbed by the Benchmark × Date and ISIN fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

B2. Placebo shocks

Tables B4, B5, and B6 present placebo tests. In these tests, I shift the monetary policy shock dates by 15 trading days, thereby breaking the temporal link between the actual ECB announcements and the observed yield reactions. If the amplification effects documented in the main analysis were spurious, for example, because hedge funds select inherently volatile bonds, the placebo shocks should produce similar results. Instead, the strong amplification effects disappear entirely. The HF Dummy interaction (0.359 in Table II) falls to -0.035, the intensity-based tightening effect (0.033 in Table V) reverses to -0.010, and the periphery short-selling amplification during tightening (0.067 in Table VIII) collapses to -0.004. These results confirm that the amplification channel operates specifically through the interaction of hedge fund positioning with the precise timing of monetary policy surprises, rather than reflecting a general correlation between hedge fund activity and bond market volatility.

Table B4: Placebo Test: Shifted Shock Dates

Dependent Variable:	**Δ Bond Yield (bps)**			
	(1)	(2)	(3) Tightening (Shock ≥ 0)	(4) Easing (Shock ≤ 0)
Main Interaction				
HF Dummy × Placebo Shock	-0.035			
	(0.077)			
HF Intensity × Placebo Shock		-0.010	-0.010	-0.010
		(0.009)	(0.009)	(0.009)
Direct Effects				
Placebo Shock	0.017	0.027	0.030	0.026
	(0.047)	(0.038)	(0.038)	(0.037)
HF Dummy	-0.158**			
	(0.073)			
HF Intensity		-0.011	-0.011	-0.011
		(0.009)	(0.009)	(0.009)
Controls				
Residual Bond Maturity	-0.057	-0.048	-0.086	-0.062
	(0.372)	(0.373)	(0.376)	(0.377)
Bid-Ask Spread	-0.403***	-0.399***	-0.413***	-0.378***
	(0.144)	(0.144)	(0.144)	(0.142)
CTD Flag	0.055	0.065	0.061	0.046
	(0.050)	(0.051)	(0.051)	(0.050)
ISIN FE	Yes	Yes	Yes	Yes
Benchmark × Date FE	Yes	Yes	Yes	Yes
Observations	418,902	417,598	411,384	411,636
R-squared	0.355	0.354	0.347	0.346

Notes: This table reports placebo tests where monetary policy shocks are shifted by 15 trading days to break the causal timing. The dependent variable is the daily change in bond yield (bps). *HF Dummy* indicates the presence of offshore hedge fund repo activity. *HF Intensity* is a continuous variable representing pre-period hedge fund intensity. Column (1) corresponds to Column (4) in Table II, Column (2) to Column (4) in Table IV, and Columns (3) and (4) to Columns (1) and (2) in Table V. The Shock main effect is not absorbed by fixed effects in this specification as the placebo shock does not coincide with the benchmark date cells. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B5: Placebo Test: Long vs. Short HF Intensity

Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	(2) Easing (Shock ≤ 0)
Interactions		
HF Intensity (Long) × Placebo Shock	-0.010	-0.010
	(0.009)	(0.009)
HF Intensity (Short) × Placebo Shock	-0.009	-0.009
	(0.009)	(0.009)
Direct Effects		
Placebo Shock	0.029	0.025
	(0.037)	(0.036)
HF Intensity (Long)	-0.003	-0.003
	(0.013)	(0.014)
HF Intensity (Short)	-0.023**	-0.023**
	(0.009)	(0.009)
Controls		
Residual Bond Maturity	-0.093	-0.068
	(0.376)	(0.376)
Bid-Ask Spread	-0.407***	-0.372***
	(0.144)	(0.143)
CTD Flag	0.056	0.041
	(0.051)	(0.051)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,920	412,174
R-squared	0.347	0.346

Notes: This table reports placebo tests where monetary policy shocks are shifted by 15 trading days. The dependent variable is the daily change in bond yield (bps). Columns (1) and (2) correspond to Columns (1) and (2) in Table VII, respectively. The Placebo Shock main effect is not fully absorbed as the shifted dates do not align with benchmark date cells. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B6: Placebo Test: Core and Periphery Effects

Dependent Variable:	**Δ Bond Yield (bps)**	
	(1) Tightening (Shock ≥ 0)	(2) Easing (Shock ≤ 0)
Core Sensitivity (Base)		
HF Intensity (Long) × Placebo Shock	-0.002	-0.002
	(0.006)	(0.006)
HF Intensity (Short) × Placebo Shock	-0.007	-0.007
	(0.005)	(0.005)
Periphery Amplification (Additional)		
HF Intensity (Long) × Placebo Shock × Periphery	-0.008	-0.008
	(0.010)	(0.010)
HF Intensity (Short) × Placebo Shock × Periphery	-0.004	-0.004
	(0.013)	(0.013)
Other Estimates		
Placebo Shock	-0.005	-0.004
	(0.041)	(0.041)
Placebo Shock × Periphery	0.046	0.039
	(0.061)	(0.059)
HF Intensity (Long) × Periphery	-0.019	-0.018
	(0.019)	(0.020)
HF Intensity (Short) × Periphery	-0.005	-0.004
	(0.016)	(0.016)
HF Intensity (Long)	0.013	0.012
	(0.012)	(0.012)
HF Intensity (Short)	-0.019*	-0.020**
	(0.010)	(0.010)
Controls		
Residual Bond Maturity	-0.093	-0.069
	(0.375)	(0.376)
Bid-Ask Spread	-0.406***	-0.371***
	(0.145)	(0.143)
CTD Flag	0.049	0.033
	(0.051)	(0.051)
ISIN FE	Yes	Yes
Benchmark × Date FE	Yes	Yes
Observations	411,920	412,174
R-squared	0.347	0.346

Notes: This table reports placebo tests where monetary policy shocks are shifted by 15 trading days. The dependent variable is the daily change in bond yield (bps). Columns (1) and (2) correspond to Columns (1) and (2) in Table VIII, respectively. The Placebo Shock main effect is not fully absorbed as the shifted dates do not align with benchmark date cells. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

B3. Categorical hedge fund intensity

Table B7 replaces the continuous intensity measure with categorical buckets to verify that the main results do not depend on the linearity assumption. Bonds are sorted into three groups based on the distribution of hedge fund positioning. The amplification increases monotonically from Low to High intensity across all specifications, confirming that the linear functional form imposed by the continuous measure is a reasonable approximation. The tightening-easing asymmetry is also preserved, consistent with the main findings.

Table B7: Robustness: Categorical Hedge Fund Intensity

Dependent Variable:	**Δ Bond Yield (bps)**		
	(1) All Shocks	(2) Tightening (Shock ≥ 0)	(3) Easing (Shock ≤ 0)
Interactions (Base: No HF Activity)			
Low Intensity × Shock	0.301***	0.455***	0.086
	(0.096)	(0.088)	(0.156)
High Intensity × Shock	0.414***	0.572***	0.193
	(0.116)	(0.142)	(0.148)
Direct Effects			
Low Intensity	-0.155**	-0.176**	-0.149**
	(0.071)	(0.072)	(0.072)
High Intensity	-0.177**	-0.204**	-0.164*
	(0.082)	(0.084)	(0.084)
Controls			
Residual Bond Maturity	-0.060	-0.112	-0.066
	(0.373)	(0.376)	(0.376)
Bid-Ask Spread	-0.399***	-0.414***	-0.380***
	(0.144)	(0.143)	(0.142)
CTD Flag	0.051	0.048	0.036
	(0.050)	(0.050)	(0.050)
ISIN FE	Yes	Yes	Yes
Benchmark × Date FE	Yes	Yes	Yes
Observations	418,902	412,676	412,931
R-squared	0.355	0.348	0.346

Notes: This table replaces the continuous HF Intensity measure with categorical buckets (None, Low, High) based on the distribution of hedge fund positioning. The omitted base category is None (no hedge fund activity). The Shock main effect is absorbed by the Benchmark × Date fixed effects. Standard errors are clustered by date and ISIN and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.