Liquidity, Credit Spreads, and Monetary Policy Shocks: Evidence from the U.S. Corporate Bond Market

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Abstract

This paper investigates the role of corporate bond liquidity and monetary policy in determining credit spreads. Using transaction-level data from the Trade Reporting and Compliance Engine (TRACE), I construct comprehensive liquidity measures—including bid-ask spreads and turnover ratios—to assess their contribution to credit spreads. I document that the loading of the liquidity risk factor varies over time and strongly correlates with the slope and the level of the yield curve, suggesting that a novel way the news channel of monetary policy affects borrowing costs. On the other hand, I find that less liquid corporate bonds experience a larger increase in credit spreads following a monetary policy news shock. My findings contribute to the broader literature on fixed-income markets by shedding light on the transmission mechanisms of monetary policy and the liquidity premium embedded in corporate bond pricing.

1 Introduction

Liquidity in financial markets refers to the ease with which an asset can be traded. In the corporate bond market, liquidity is critical because bonds are often traded over-the-counter (OTC), making liquidity highly variable compared to equity markets. In fact, transactions in the corporate bond market is not as frequent and has to carried out by broker-dealers, that can charge a significant premium on the price. This lower trade frequency, combined with the market power exerted by dealers, contributes to the structural illiquidity of OTC markets. However, the supply of money and money-like assets plays a pivotal role in amplifying or mitigating liquidity constraints, influencing the pricing of bonds and their response to economic shocks. At the same time, liquidity conditions shape how securities traded in OTC markets react to changes in monetary policy. Given these dynamics, understanding the interaction between liquidity and monetary policy is essential for a comprehensive analysis of credit market behavior.

This study explores the extent to which monetary policy and corporate bond liquidity jointly determine borrowing costs. I find that the sensitivity of corporate bond excess returns to liquidity risk—measured through bid-ask spreads and turnover ratios—varies with the level and slope of the yield curve, suggesting that investors incorporate both current and expected monetary policy stances into bond pricing decisions. This relationship is further reinforced by the observation that liquidity influences how corporate bond spreads react to monetary policy shocks, with less liquid bonds exhibiting a stronger response. These findings underscore the importance of liquidity as a transmission channel for monetary policy and highlight its role in shaping credit market outcomes.

Understanding how monetary policy affects corporate borrowing costs is essential for both financial stability and macroeconomic policy formulation. By examining the interaction between liquidity and monetary policy, this study provides new insights into the mechanisms driving credit market dynamics and the pricing of corporate bonds.

1.1 Literature Review

1.1.1 On Liquidity

Empirical research has developed a range of proxies to measure liquidity in financial markets. Beyond traditional measures such as turnover ratios—the ratio of traded volume to outstanding securities—and bid-ask spreads, the literature has introduced more sophisticated metrics. Notable contributions include price impact measures Kyle (1985), the effective bid-ask spread Roll (1984), and the illiquidity measure of Amihud (2002), which captures the price impact of trading volume by computing the daily average return per dollar traded. Edwards et al. (2007) employ bid-ask spreads to assess direct trading costs, while Bao et al. (2011) introduce a market-adjusted liquidity measure, which accounts for transitory price movements to reflect varying trading conditions.

Early studies by Amihud and Mendelson (1986) and Amihud (2002) highlight the relationship between liquidity risk, asset prices, and required returns in equity markets. These empirical findings were later formalized in theoretical models such as those of Acharya and Pedersen (2005). In the context of corporate bonds, Chen et al. (2007) and Bao et al. (2011) confirm that liquidity accounts for a substantial share of the variation in corporate bond spreads. The importance of liquidity becomes even more pronounced during periods of financial distress, as illiquidity exacerbates credit spreads, particularly for bonds with higher default risk Lin et al. (2011). Liquidity shocks can also heighten refinancing risk and default probabilities, emphasizing the need for liquidity provisions during crises to prevent market disruptions He and Xiong (2012).

The liquidity of corporate bonds is shaped by multiple factors, including bond characteristics, market structure, and macroeconomic conditions. Empirical evidence suggests that bonds with lower credit ratings and longer maturities tend to be less liquid Houweling et al. (2005). Additionally, callable and structured bonds exhibit lower liquidity due to their complex valuation Helwege et al. (2014). The over-the-counter (OTC) nature of corporate bond trading also contributes to fragmented liquidity, distinguishing it from centralized equity exchanges Bessembinder et al. (2006). Macroeconomic conditions further influence liquidity, with studies showing that liquidity deteriorates and trading volumes decline during financial crises **acharya2013liquidity; dick2012corporateempty citation**. These patterns were particularly evident during the Global Financial Crisis, when bond markets experienced a sharp contraction in liquidity.

1.1.2 On Monetary Policy and Asset Prices

Monetary policy shocks play a critical role in shaping asset prices and returns by influencing interest rates, risk premia, and expectations about future economic conditions. Classic asset pricing theories suggest that monetary policy primarily affects risk-free rates, which serve as a discounting mechanism for valuing financial assets. However, empirical research has shown that monetary shocks have broader effects on risk premia and asset valuation, often through unexpected changes in central bank policy decisions. Bernanke and Kuttner (2005) develop an identification strategy to isolate unanticipated monetary policy shocks using expectation revisions, showing that asset prices respond almost immediately to policy changes. Similarly, Gertler and Karadi (2015) provide evidence that contractionary monetary shocks lead to declines in equity prices, driven by increases in the cost of capital and deteriorating expectations about future earnings. Rigobon and Sack (2004) find that monetary policy surprises result in significant declines in stock indices, adopting an identification strategy based on the heteroskedasticity of policy shocks.

Monetary policy also affects bond liquidity. Krishnamurthy and Vissing-Jorgensen (2011) argue that higher interest rates can reduce liquidity by increasing holding costs, while quantitative easing (QE) programs improve liquidity by reducing spreads and stimulating trading activity. The risk-taking channel of monetary policy further influences market liquidity and risk appetite Borio and Zhu (2012). Monetary tightening leads to wider credit spreads, reflecting higher default risk and liquidity constraints Hanson and Stein (2014).

2 Data

The TRACE database provides detailed trade-level information essential for analyzing corporate bond market dynamics. Each transaction is uniquely identified by its CUSIP code, which links the bond to its issuer and characteristics. The dataset also records the trade date and time in Eastern Standard Time (EST), facilitating an analysis of intraday liquidity fluctuations. In addition to trade timestamps, TRACE specifies the counterparty type, indicating whether the transaction occurred between two dealers or between a dealer and a customer, and the counterparty side, which denotes whether the trade represented a purchase or a sale for the reporting dealer.

The dataset further includes key pricing and volume measures. The trade price represents the transaction price per \$100 face value, while the yield-to-maturity (YTM) is computed based on the bond's trade price, coupon payments, and time to maturity. The trade volume captures the total par value exchanged in a given trade, with large transactions subject to dissemination caps to limit market impact.

To enrich the dataset with firm-level characteristics, I merge TRACE with the Mergent-FISD database, which provides bond issuance details, including the credit rating at the time of trade and the total amount of outstanding debt for each issuer. Additionally, I integrate financial statement data from COMPUSTAT, focusing on variables related to profitability, liquidity, and leverage. Specifically, I consider operating margin (before depreciation), return on assets, cash ratio, current ratio, debt-to-capital ratio, and debt-to-EBITDA ratio, ensuring a comprehensive view of firm-specific determinants of bond spreads.

2.1 Liquidity Measures

Liquidity is measured either using turnover or the bid-ask spread. I will perform all the empirical analysis using both these proxies, bearing in mind that higher turnover implies more liquid bonds whereas higher bid-ask spreads imply stronger dependence on dealers and, therefore, more illiquid bonds.

First, I compute the bid price as the average daily sell price from dealer to customer for a specific bond i during day t. In formulas:

$$\mathrm{Bid}_{it} = \frac{1}{N} \sum_{hh \in t} P_{i,hh}(S, D \to C) \tag{1}$$

where $P_{i,hh}$ represents the price for bond i in transaction hh classified as a dealer-to-customer sale $(S, D \to C)$. The ask price, on the other hand, corresponds to the average daily transaction price for customer-to-dealer purchases, given by:

$$\text{Ask}_{it} = \frac{1}{N} \sum_{hh \in t} P_{i,hh}(B, C \to D) \tag{2}$$

The bid-ask spread is then computed as the normalized difference between bid and ask prices:

$$\text{Bid-Ask Spread}_{it} = 2 \times \frac{\text{Bid}_{it} - \text{Ask}_{it}}{\text{Bid}_{it} + \text{Ask}_{it}} \tag{3}$$

In addition to bid-ask spreads, turnover is employed as an alternative liquidity measure, capturing the frequency of trading activity relative to outstanding bond issuance. Turnover is defined as:

$$\text{Turnover}_{it} = \frac{1}{N} \sum_{hh \in t} \frac{\text{volume}_{i,hh}}{\text{outstanding}_{it}} \tag{4}$$

where $\text{volume}_{i,hh}$ represents the traded volume of bond i in transaction hh, and outstanding_{it} denotes the total outstanding amount of the bond.

2.2 Credit Spreads

To compute credit spreads, I estimate the risk-free yield curve using the model in Nelson and Siegel (1987). For each day t, the risk-free yield at maturity τ is given by:

$$y_t^{rf}(\tau) = \theta_{1,t} + \theta_{2,t} \left(\frac{1 - \exp(-\lambda_t \tau)}{\lambda_t \tau} \right) + \theta_{3,t} \left(\frac{1 - \exp(-\lambda_t \tau)}{\lambda_t \tau} - \exp(-\lambda_t \tau) \right) \tag{5}$$

where the parameters $(\lambda_t, \theta_{1,t}, \theta_{2,t}, \theta_{3,t})$ are estimated using daily yield curve data. The daily credit spread for bond i is then calculated as the difference between the bond's yield and the estimated risk-free yield at the same maturity:

$$\text{cs}_{it} = \text{YTM}_{it} - y_t^{rf}(\text{TTM}_{it}) \tag{6}$$

where YTM_{it} and TTM_{it} denote the bond's yield to maturity and time to maturity, respectively.

3 Empirical Strategy

To assess the time varying nature of the relationship between liquidity and credit spreads, for each month m I estimate the following panel regression model:

$$\text{cs}_{i,t} = \alpha_m + \alpha_m^R + \beta_m \text{liq}_{it} + \gamma_{m,0}' \mathbf{x}_t^{agg} + \gamma_{m,1}' \mathbf{x}_{i,t}^{fr} + \epsilon_{it} \qquad t \in m \tag{7}$$

where liq_{it} represents a liquidity measures, and $\mathbf{x}_t^{agg}$ and $\mathbf{x}_{i,t}^{fr}$. denote aggregate and firm-specific control variables, respectively. Aggregate controls include the level and slope of the yield curve, the VIX index, and the ICE-BofA spread between high-yield and investment-grade bonds. Firm-specific controls capture profitability, liquidity leverage.

Given potential endogeneity concerns, I employ an instrumental variable (IV) approach, using the average number of trades in the previous 30 days as an instrument for liq_{it}. This variable is strongly correlated with liquidity but is exogenous to *current* credit spreads.

To explore the impact of monetary policy shocks, I partition bonds in two ways. First, I classify them into high, medium and low liquidity, depending on the percentile of the liquidity distribution. I then run the following regression:

$$\text{cs}_{i,t+h} = \alpha + \alpha^R + \beta_h^{\text{liq}} \Delta i_t + \gamma_0' \mathbf{x}_t^{agg} + \gamma_1' \mathbf{x}_{i,t}^{fr} + \epsilon_{it} \qquad \text{liq} \in \{\text{high, medium, low}\} \tag{8}$$

where Δi_t represents the high-frequency identified monetary policy shock. By doing so, I am applying the logic of local projection introduced by Jordà (2005), according to which the impulse response function of a shock is the coefficient in the above regression: $IRF(h) = \beta_h$.

Then, I split bonds into six portfolios, sorted by credit rating (Investment Grade vs. High Yield) and liquidity (Low, Medium, High). I estimate the following regression separately for each portfolio:

$$\text{cs}_{i,t+h} = \alpha + \alpha^p + \beta_h^p \Delta i_t + \gamma_0' \mathbf{x}_t^{agg} + \gamma_1' \mathbf{x}_{i,t}^{fr} + \epsilon_{it} \qquad i \in p \tag{9}$$

where Δi_t represents the high-frequency identified monetary policy shock, and p indexes the six risk-liquidity portfolios:

$$p \in \{\text{HY-low}, \text{HY-med}, \text{HY-lowHY-high}, \text{IG-low}, \text{IG-med}, \text{IG-lowIG-high}\}$$

This framework allows me to quantify how monetary policy differentially affects credit spreads based on liquidity and risk exposure, providing insights into the transmission mechanisms of monetary policy in corporate bond markets.

4 Preliminary Results

5 Conclusion

This research highlights the crucial role of liquidity in determining how monetary policy shocks affect corporate credit spreads. The empirical results provide evidence that more liquid bonds display lower credit spreads all else equal, but they also experience smaller responses to monetary policy shocks.

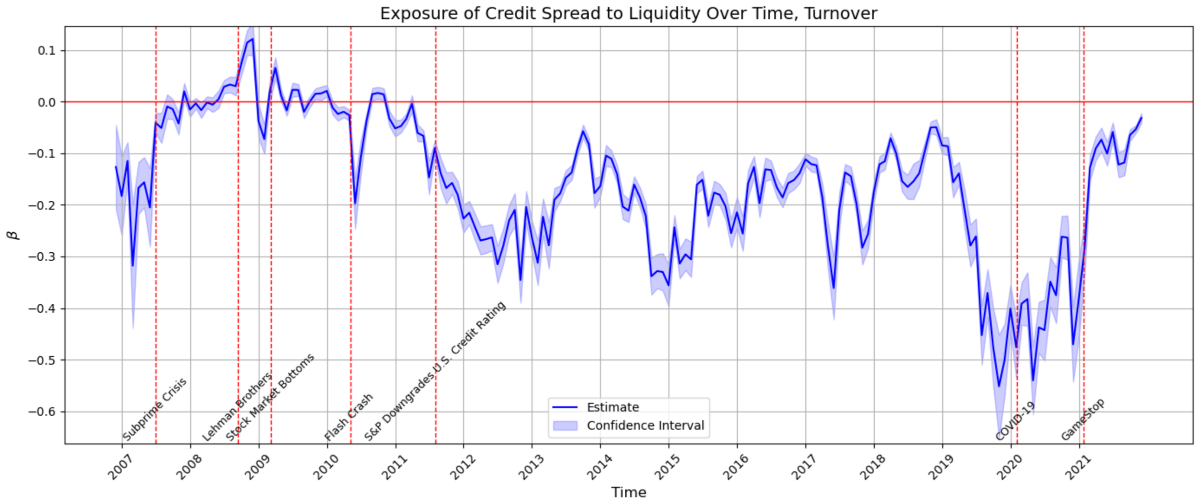

Figure 1: Time series of the coefficient $\{\beta_m\}_m$ from the rolling regression displayed in Equation 7, along with major financial market events. The liquidity measure employed is the turnover ratio.

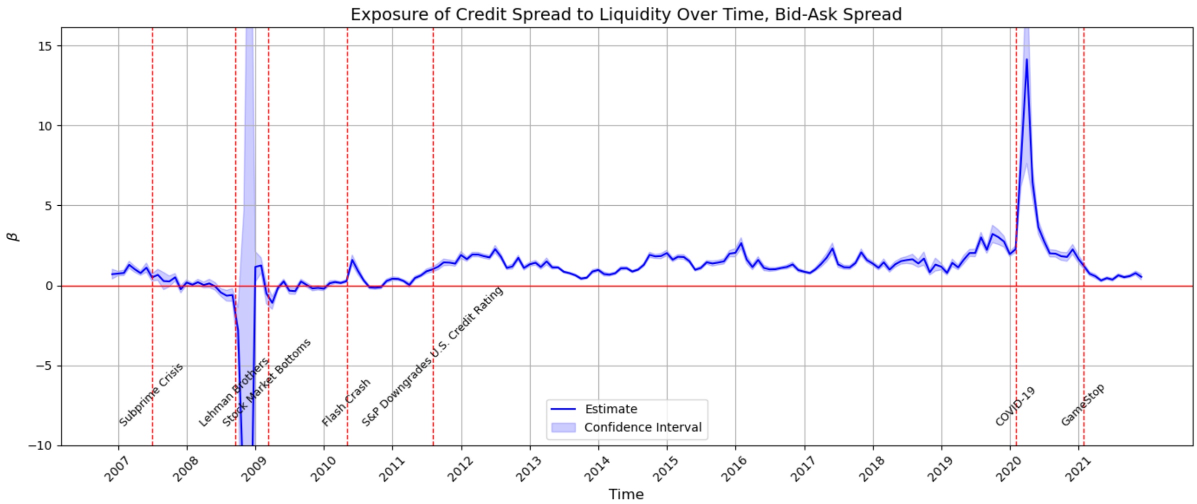

Figure 2: Time series of the coefficient $\{\beta_m\}_m$ from the rolling regression displayed in Equation 7, along with major financial market events. The liquidity measure employed is the $\log \text{Bid-Ask}_{it}$.

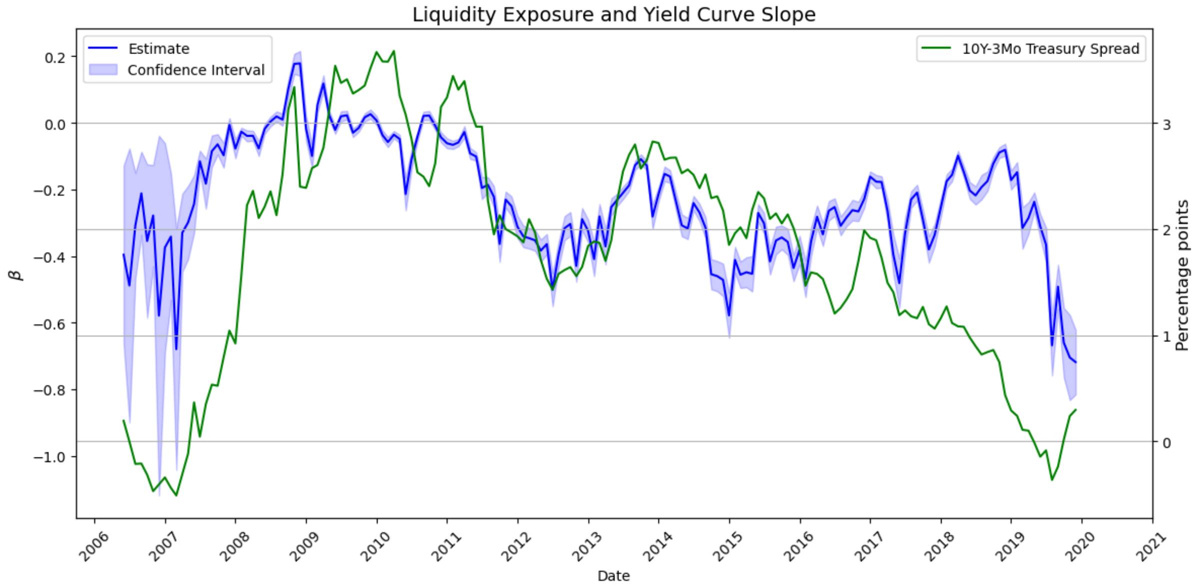

Figure 3: The loading on the liquidity risk factor plotted against the 10 year - 3 month spread highlights a comovement between the to variables. Liquidity is proxied by the turnover ratio.

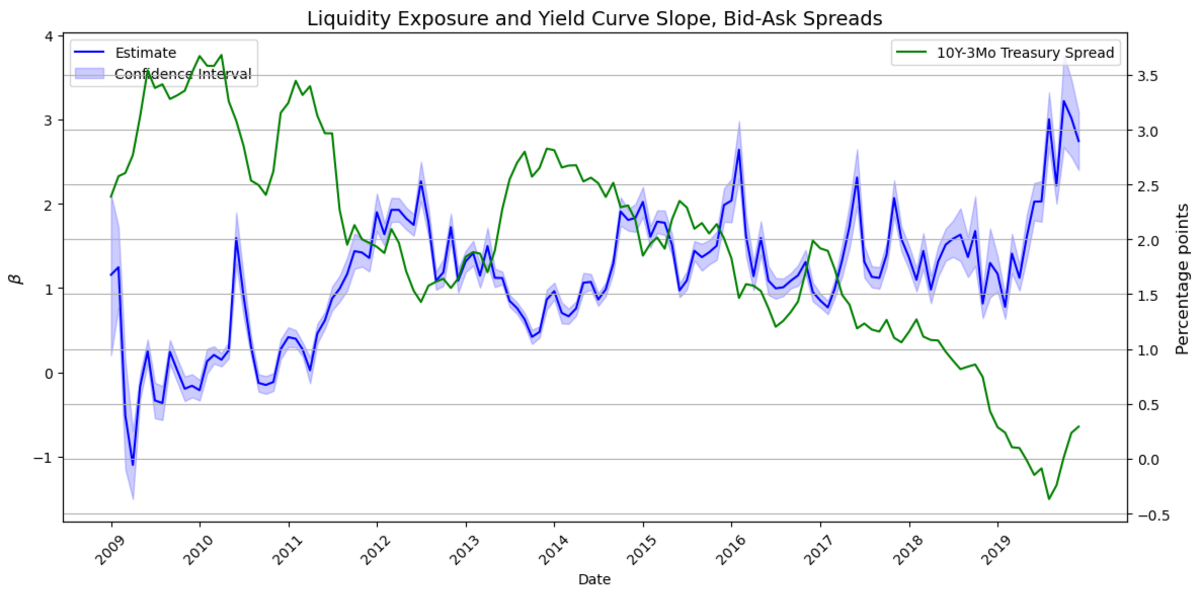

Figure 4: The loading on the liquidity risk factor plotted against the 10 year - 3 month spread highlights a negative comovement between the to variables. Liquidity is proxied by $\log \text{Bid-Ask}_{it}$. Only pre-Covid sample is displayed.

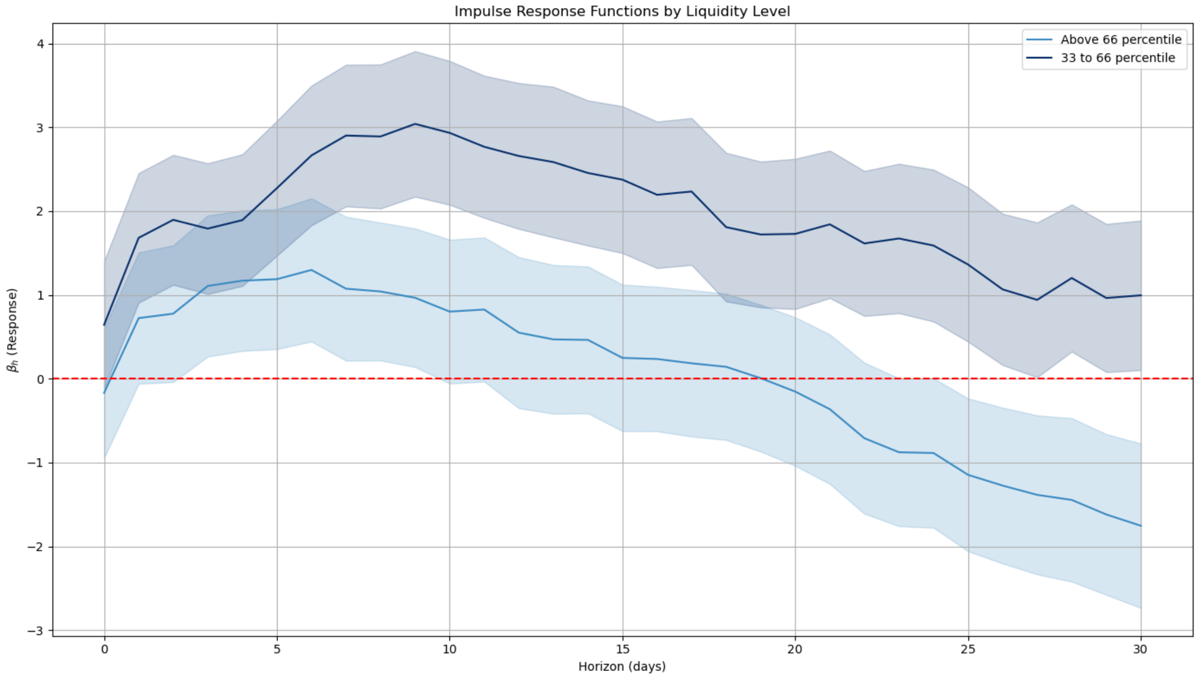

Figure 5: Impulse responses of credit spreads to monetary policy shocks, bonds are divided in low and high liquidity according to their turnover.

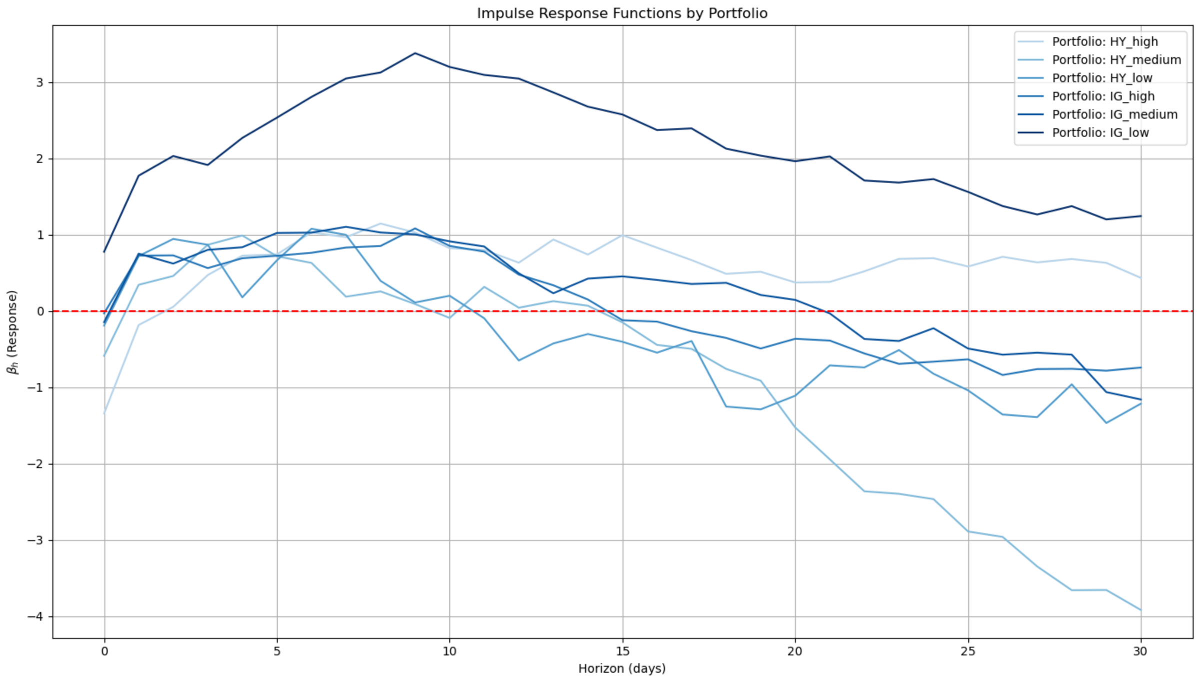

Figure 6: Impulse responses of credit spreads to monetary policy shocks. Bonds are divided in portfolios sorted by liquidity and risk.

This suggests that liquidity dampens away the effects of rate hikes. These findings have implications for policymakers and market participants, emphasizing the need for liquidity considerations in financial stability assessments and monetary policy design.

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