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

Giacomo Cattelan

Abstract

This paper investigates the role of bond liquidity in determining credit spreads and explores the impact of monetary policy shocks on corporate bond markets. 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. To address potential endogeneity, I implement an instrumental variable (IV) strategy using lagged trading activity as an instrument for liquidity. Furthermore, I analyze the differential impact of monetary policy shocks across portfolios sorted by credit rating and liquidity. The results suggest that less liquid bonds experience a larger increase in corporate borrowing costs. 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

This study examines the effect of monetary policy shocks on the cost of credit, with a particular focus on the role of bond liquidity. Understanding how monetary policy influences corporate borrowing costs is essential for both financial stability and macroeconomic policy design. The research seeks to determine whether the impact of monetary policy shocks on credit spreads differs across bonds with varying degrees of liquidity. Liquidity in financial markets refers to the ease with which an asset can be traded without significantly affecting its price. 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.

1.1 Literature Review

1.1.1 On Liquidity

Empirical studies have developed and refined various proxies to measure liquidity, such as price impact(see Kyle (1985)), bid-ask spread (see Roll (1984)), trading volume and turnover (see Chordia et al. (2005)), and market depth. Amihud (2002) captures the price impact of trading volume by computing the daily average return per dollar traded. Edwards et al. (2007) use bid-ask spreads to measure direct trading costs, like for instance. Turnover ratios, defined as trading volume divided by outstanding bond issuance, serve as another widely used measure Chen et al. (2007). Additionally, Bao et al. (2011)'s market-adjusted liquidity measures integrate price impact and bid-ask spread to reflect varying trading conditions.

Early foundational works by Amihud and Mendelson (1986) highlight how liquidity risk affects asset prices and required returns. Investors demand higher returns for holding illiquid bonds, as shown by Chen et al. (2007), supporting theoretical models linking liquidity risk to expected returns, as in Acharya and Pedersen (2005). Bao et al. (2011) confirm that liquidity accounts for a significant portion of variation in corporate bond spreads. Liquidity and credit risk are closely intertwined. Illiquidity exacerbates credit spreads on bonds with higher default risk, especially during financial distress Lin et al. (2011). Liquidity shocks can heighten refinancing risk and default probabilities He and Xiong (2012), which underscores the need for liquidity provisions during crises to prevent market freezes and systemic risks Brunnermeier and Pedersen (2009). Policymakers must carefully balance transparency and incentives to maintain market efficiency and stability.

Liquidity in the bond market is influenced by factors including bond characteristics, market structure, and macroeconomic conditions. Bonds with lower credit ratings and longer maturities typically have lower liquidity, as demonstrated by Houweling et al. (2005). Helwege et al. (2014) showed that callable and structured bonds are also less liquid due to their complex valuation. Bessembinder et al. (2006) proved that the OTC structure of bond trading leads to fragmented liquidity compared to centralized exchanges. Moreover, Acharya et al. (2013) and Dick-Nielsen et al. (2012) documented that liquidity deteriorates and trading volumes decline during periods of financial stress, as seen during the Global Financial Crisis.

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 exogenous monetary policy shocks using high-frequency financial market data, showing that asset prices respond almost immediately to unanticipated 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. Research by Rigobon and Sack (2004) finds that monetary policy surprises result in significant declines in stock indices, with stronger effects in periods of heightened uncertainty.

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. 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:

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

where $P_{i,hh}$ represents the transaction price for bond i at time 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 Computation of Credit Spreads

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

$$y_t^{rf}(\tau) = \theta_1 + \theta_2 \left(\frac{1 - \exp(-\lambda\tau)}{\lambda\tau} \right) + \theta_3 \left(\frac{1 - \exp(-\lambda\tau)}{\lambda\tau} - \exp(-\lambda\tau) \right) \tag{5}$$

where the parameters $(\lambda, \theta_1, \theta_2, \theta_3)$ are estimated using daily yield curve data. The credit spread for bond i on day t 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 relationship between liquidity and credit spreads, I estimate the following panel regression model:

$$\text{cs}_{i,t} = \alpha + \beta \text{liq}_{it} + \gamma_0' \mathbf{x}_t^{agg} + \gamma_1' \mathbf{x}_{i,t}^{fr} + \epsilon_{it} \tag{7}$$

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 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:

$$\text{cs}_{i,t+h} = \alpha_i + \beta_h^p \Delta i_t + \gamma_0' \mathbf{x}_t^{agg} + \gamma_1' \mathbf{x}_{i,t}^{fr} + \epsilon_{it} \qquad i \in p \tag{8}$$

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

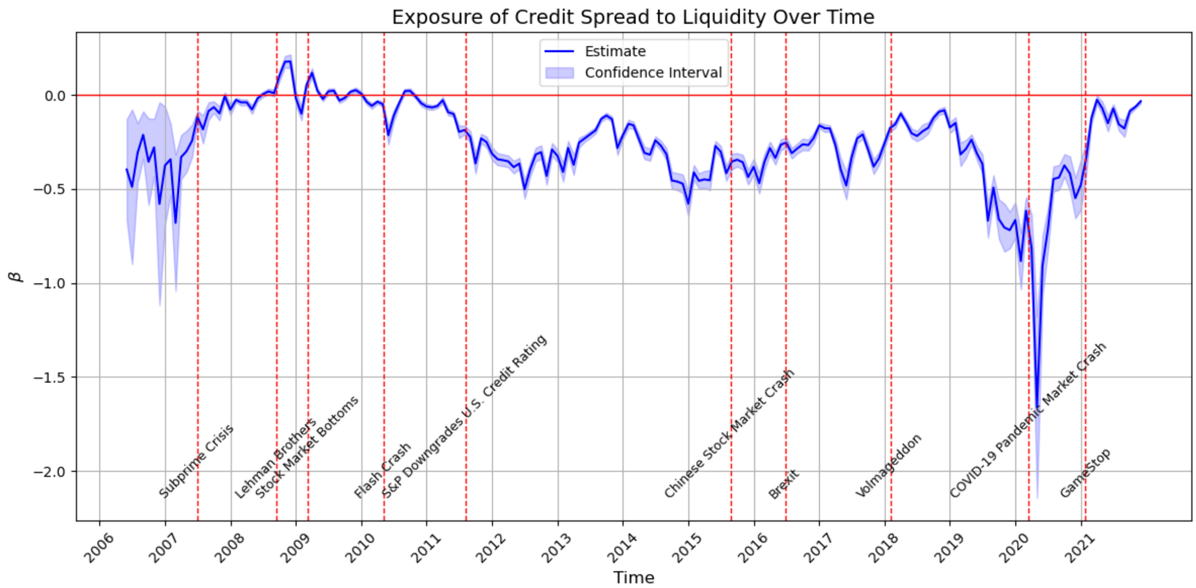

Figure 1: Coefficient of the rolling regression displayed in Equation 8, where the liquidity measure is given by the turnover ratio, with major financial market events

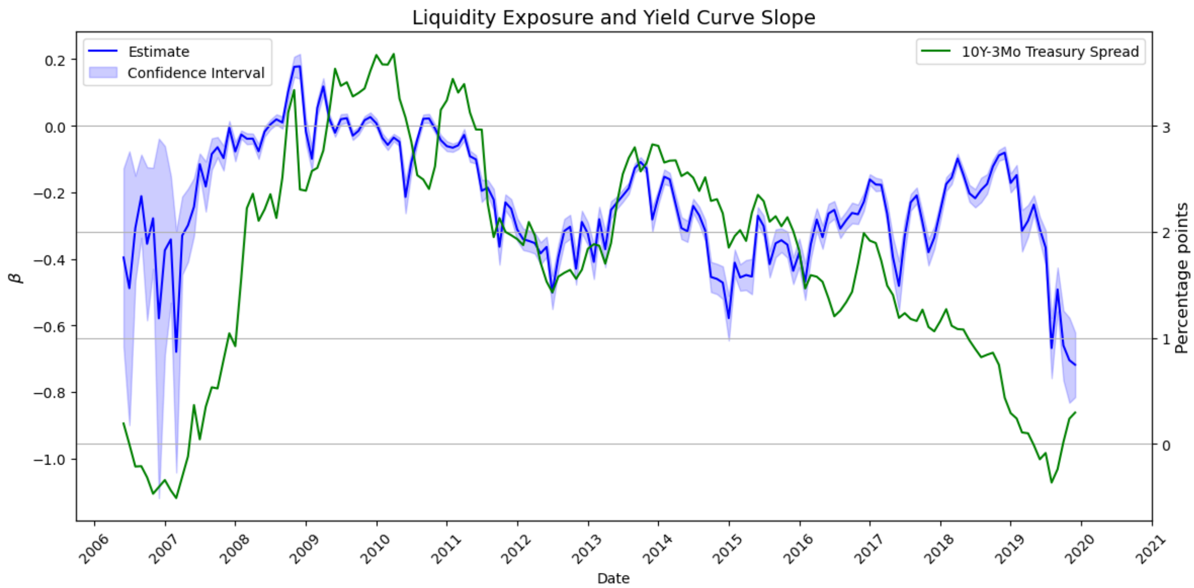

Figure 2: The effect of liquidity on credit spreads, measured as the β coefficient of Equation 8, is plotted against the 10 year - 3 month spread for each month in the pre-Covid sample.

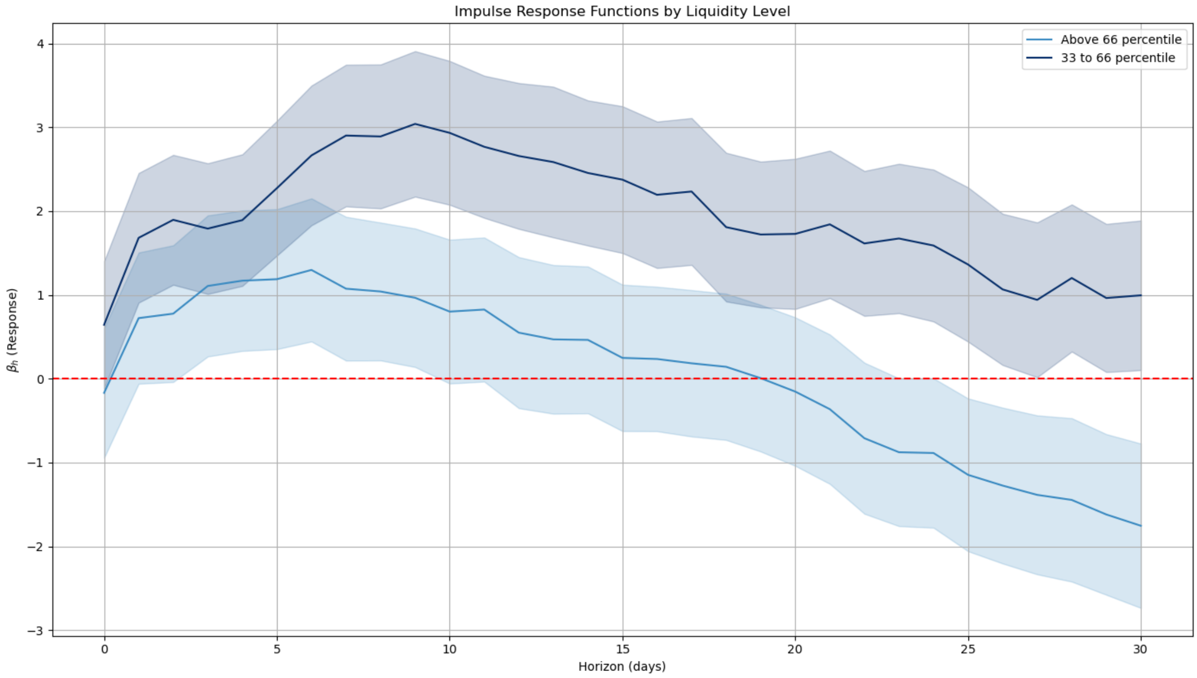

Figure 3: Impulse responses of credit spreads to monetary policy shocks, bonds are divided in low and high liquidity according to their turnover.

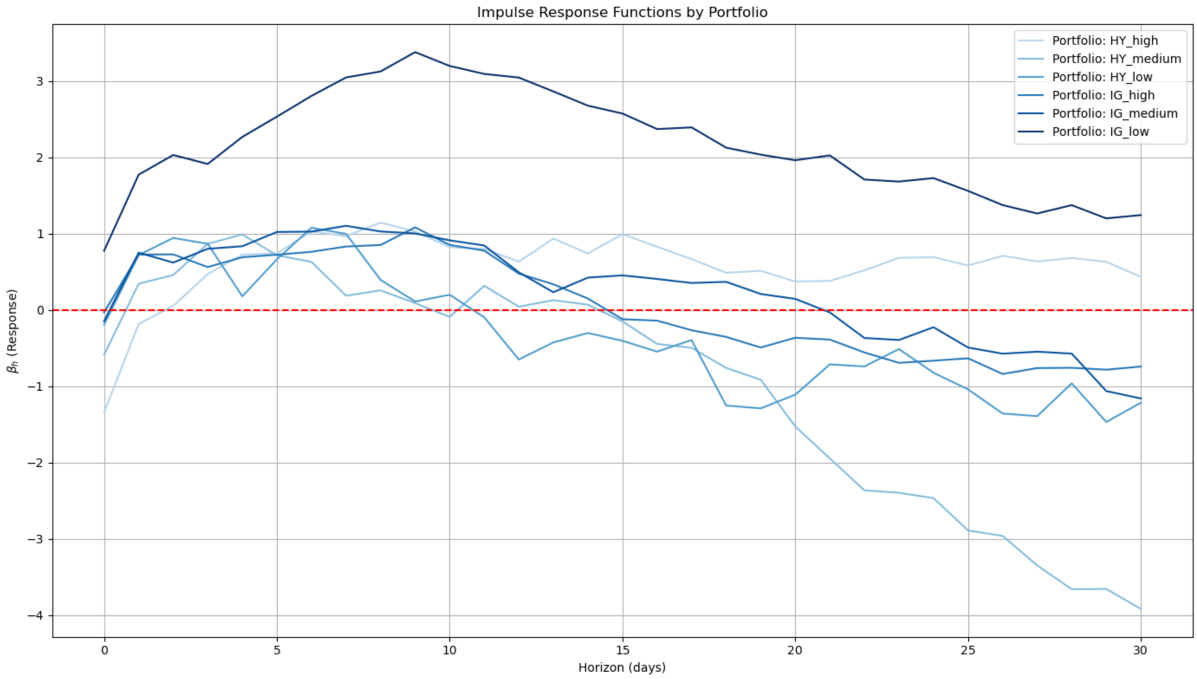

Figure 4: Impulse responses of credit spreads to monetary policy shocks. Bonds are divided in portfolios sorted by liquidity and risk.

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. 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.

References

Acharya, V. V., Amihud, Y., & Bharath, S. T. (2013). Liquidity risk of corporate bond returns. *Journal of Financial Economics*, *110*(2), 358–386.

Acharya, V. V., & Pedersen, L. H. (2005). Asset pricing with liquidity risk. *Journal of Financial Economics*, *77*(2), 375–410.

Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, *5*(1), 31–56.

Amihud, Y., & Mendelson, H. (1986). Asset pricing and the bid-ask spread. *Journal of Financial Economics*, *17*(2), 223–249.

Bao, J., Pan, J., & Wang, J. (2011). The illiquidity of corporate bonds. *Journal of Finance*, *66*(3), 911–946.

Bernanke, B. S., & Kuttner, K. N. (2005). What explains the stock market's reaction to federal reserve policy? *Journal of Finance*, *60*(3), 1221–1257.

Bessembinder, H., Maxwell, W. F., & Venkataraman, K. (2006). An empirical analysis of market segmentation in the u.s. corporate bond market. *Journal of Financial Economics*, *82*(2), 251–288.

Borio, C., & Zhu, H. (2012). Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism? *Journal of Financial Stability*, *8*(4), 236–251.

Brunnermeier, M. K., & Pedersen, L. H. (2009). Market liquidity and funding liquidity. *Review of Financial Studies*, *22*(6), 2201–2238.

Chen, L., Lesmond, D. A., & Wei, J. (2007). Corporate yield spreads and bond liquidity. *Journal of Finance*, *62*(1), 119–149.

Chordia, T., Roll, R., & Subrahmanyam, A. (2005). Commonality in liquidity. *Journal of Financial Economics*, *56*(1), 3–28.

Dick-Nielsen, J., Feldhütter, P., & Lando, D. (2012). Corporate bond liquidity before and after the onset of the subprime crisis. *Journal of Financial Economics*, *103*(3), 471–492.

Edwards, A. K., Harris, L. E., & Piwowar, M. S. (2007). Corporate bond market transaction costs and transparency. *Journal of Finance*, *62*(3), 1421–1451.

Gertler, M., & Karadi, P. (2015). Monetary policy surprises, credit costs, and economic activity. *American Economic Journal: Macroeconomics*, *7*(1), 44–76.

Hanson, S. G., & Stein, J. C. (2014). Monetary policy and long-term real rates. *Journal of Financial Economics*, *115*(3), 429–448.

He, Z., & Xiong, W. (2012). Rollover risk and credit risk. *Journal of Finance*, *67*(2), 391–429.

Helwege, J., Sarkar, A., & Wang, Y. (2014). Liquidity and price pressure in the corporate bond market: Evidence from mega-bonds. *Journal of Financial Intermediation*, *23*(3), 511–544.

Houweling, P., Mentink, A., & Vorst, T. (2005). Comparing possible proxies of corporate bond liquidity. *Journal of Banking Finance*, *29*(6), 1331–1358.

Krishnamurthy, A., & Vissing-Jorgensen, A. (2011). The effects of quantitative easing on interest rates. *Brookings Papers on Economic Activity*, *2011*, 215–287.

Kyle, A. S. (1985). Continuous auctions and insider trading. *Econometrica*, *53*(6), 1315–1335.

Lin, H., Wang, J., & Wu, C. (2011). Liquidity risk and corporate bond returns. *Journal of Financial Economics*, *99*(3), 628–650.

Nelson, C. R., & Siegel, A. F. (1987). Parsimonious modeling of yield curves. *The Journal of Business*, *60*(4), 473–489.

Rigobon, R., & Sack, B. (2004). The impact of monetary policy on asset prices. *Journal of Monetary Economics*, *51*(8), 1553–1575.

Roll, R. (1984). A simple implicit measure of the effective bid-ask spread in an efficient market. *Journal of Finance*, *39*(4), 1127–1139.