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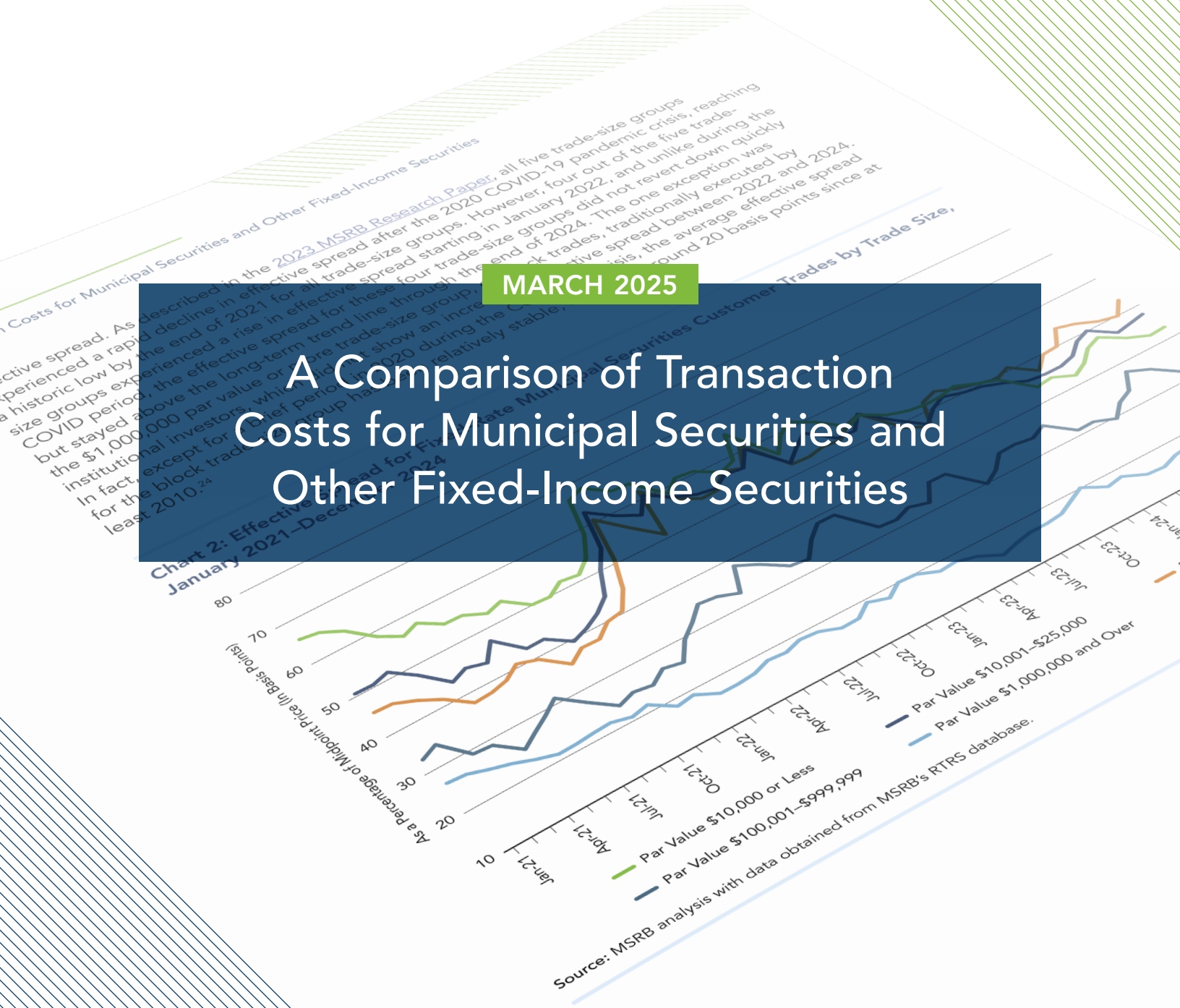
A Comparison of Transaction Costs for Municipal Securities and Other Fixed-Income Securities



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Abstract[1]

Despite their long-term downward trend, customer trading costs in the municipal market, measured as effective spread, increased in 2022 with the spike in inflation and subsequent increase in interest rates. Higher effective spreads have persisted for much longer than they did during past market crises, such as the 2013 "Taper Tantrum"[2] and the 2020 COVID-19 market crisis, as a interest rates have remained elevated despite the decline in inflation, which may be the result of the markets pricing in expected future inflation. By the end of 2024, the average monthly effective spread (as a percentage of trade price) was approximately 50 basis points compared to the low of 42 basis points reached in late 2021. An August 2023 MSRB paper investigated the likely causes behind the surge in the effective spread since early 2022, finding that rising inflation and interest rates were likely the main culprits for the decline in bond prices, which in turn drove effective spread up.[3] Moreover, the difference in effective spread between customer trades of $100,000 par value or less ("odd-lot" trades) and those of $1,000,000 par value or more ("block" trades) has persisted since 2020, though it had been narrowing gradually in the years before 2020.

In addition to looking at the evolution of effective spreads for municipal market transactions, this paper compares the effective spread of municipal securities with that of other fixed income securities, namely, corporate bonds and agency securities. The average effective spread for municipal securities traded between January 2023 and June 2024 was 53 basis points, as compared to 36 basis points for corporate bonds and 40 basis points for agency securities. In addition, while smaller trades generally have higher effective spreads than larger trades for all fixed income securities, the difference in spreads was more pronounced for municipal securities (38 basis points) than for corporate bonds (25 basis points) and slightly higher compared to agency securities (32 basis points).

1 The views expressed in this commentary are those of the author(s) and do not necessarily reflect the views and positions of MSRB.

2 When the Board of Governors of the Federal Reserve System indicated future tapering of its quantitative easing policy.

3 See Wu, Simon Z., Nicholas J. Ostroy, "What Has Driven the Surge in Transaction Costs for Municipal Securities Investors Since 2022?" Research Paper, Municipal Securities Rulemaking Board, August 2023.

Introduction

In August 2023, MSRB published a report titled "What Has Driven the Surge in Transaction Costs for Municipal Securities Investors Since 2022?" (2023 MSRB Research Paper),[4] which identified two likely causes behind the 2022 surge in the effective spread in the municipal securities market. The first cause was a decline in bond prices.[5] The second likely cause was elevated market volatility resulting from rising inflation and interest rates in the United States. Despite the slow but steady decline in inflation since 2022 and the recent slight decline in interest rates, the municipal securities market has continued to experience heavy trading volume, and yields and volatility have remained high as of 2024.[6] In fact, in 2024, the annual number of trades reported to MSRB's Real-Time Transaction Reporting System (RTRS) exceeded all previous records dating to the 2005 implementation of the RTRS system.

This paper examines recent trends in customer transaction costs, measured as effective spread, by accounting for the latest developments in the macro environment and in the municipal securities market. Additionally, the paper compares the effective spread of customer trades between municipal securities and other fixed income securities, in particular, corporate bonds and agency securities, with an emphasis on the relationship of trade size and effective spread.

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4 This research paper builds on previous MSRB research conducted on the transaction cost analysis for dealer-to-customer trades in municipal securities in 2018 (Wu, Simon Z., "Transaction Costs for Customer Trades in the Municipal Bond Market: What is Driving the Decline?" Research Paper, Municipal Securities Rulemaking Board, July 17, 2018), in 2019 (Wu, Simon Z. and Marcelo Vieira, "Mark-up Disclosure and Trading in the Municipal Bond Market," Research Paper, Municipal Securities Rulemaking Board, July 2019), and in 2021 (Wu, Simon Z. and Nicholas J. Ostroy, "Transaction Costs During the COVID-19 Crisis: A Comparison between Municipal Securities and Corporate Bond Markets," Research Paper, Municipal Securities Rulemaking Board, August 2021.

5 The bond price decline may have elevated the effective spread because discount bonds are less liquid than premium bonds due to the Internal Revenue Service's (IRS's) de minimis tax rule, which has a greater impact on tax-exempt bonds with larger discounts. Also, dealers tend to charge a relatively fixed mark-up for customer trades (e.g., 25 basis points when expressed in yield), whether it is for a markup or markdown, or a spread from a benchmark index such as Treasury securities. Therefore, when prices decline, the effective spread increases.

6 *See* Wu, Simon and John Bagley, "What Drives Trading Volume in the Municipal Securities Market? A Study of Likely Factors," Research Paper, Municipal Securities Rulemaking Board, February 2025.

Methodology and Data

Methodology

As previously explained, transaction costs are an important metric to monitor for the following reasons. First, transaction costs are important to investors because they impact net investment returns, as high transaction costs would diminish returns. Second, market-related contributing factors to transaction costs, such as market liquidity and volatility,[7] usually affect trading costs across all municipal securities. Economists and other industry researchers therefore use transaction costs as one measure to capture a dimension of market liquidity,[8] with higher transaction costs generally suggesting less liquidity, all else being equal.[9] Consequently, analyzing transaction cost trends provides unique insight into the secondary market for municipal securities.

Unlike the equity market, where trading activity is facilitated by an exchange, the municipal securities market and other fixed income markets, like the corporate bond and agency securities markets, largely function as over-the-counter marketplaces where investors place their orders with dealers directly without a centralized facility. Dealers either execute orders by committing dealer capital (principal trades) or by searching for an intermediary in the market to facilitate transactions. Investors then normally pay the dealer either a markup, a commission or an annual fee for a fee-based account[10] to compensate for providing intermediary services and/or for taking on and bearing principal risk.[11] Contributing factors to transaction costs generally include characteristics of individual securities, liquidity, volatility, counterparty search cost and dealer-customer bargaining power resulting from information opacity,[12] as well as other macro-environment factors. To quantify the transaction costs paid by investors to execute their trades, financial economists and market

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7 *See* Green, Richard, Burton Hollifield and Norman Schürhoff, "Financial Intermediation and Costs of Trading in an Opaque Market," Review of Financial Studies, Volume 20, 2007; and Harris, Larry and Michael Piwowar, "Secondary Trading Costs in the Municipal Bond Market," Journal of Finance, Volume 61, 2006.

8 Other measures of liquidity include total trading volume and price impact from a given size of a trade.

9 For more background information on transaction costs, please refer to Wu, Simon Z., "Transaction Costs for Customer Trades in the Municipal Bond Market: What is Driving the Decline?" (the 2018 MSRB Research Paper).

10 Trades conducted as a part of a fee-based account (such as a separately managed accounts) may incur less or no transaction costs as the costs are typically incorporated into the account fee assessment.

11 *See* Wu, Simon Z., the 2018 MSRB Research Paper.

12 *See* Cuny, Christine, "When Knowledge Is Power: Evidence from the Municipal Bond Market," Journal of Accounting and Economics, August 4, 2017; Green, Richard, Burton Hollifield and Norman Schürhoff, "Financial Intermediation and Costs of Trading in an Opaque Market," Review of Financial Studies, Volume 20, 2007; and Harris, Larry and Michael Piwowar, "Secondary Trading Costs in the Municipal Bond Market," Journal of Finance, Volume 61, 2006. "Search cost" is defined as the cost investors and dealers incur when seeking a counterparty to trade, while "information opacity" refers to the cost of gathering fundamental information that affects an investor's bargaining power with dealers.

participants use spread as a common measure, which could be based on pre-trade quote data (bid-ask spread) or actual trade data (effective spread).[13]

MSRB has previously used the effective spread from secondary market trade data to compute transaction costs.[14] This analysis similarly uses effective spread as a measurement for transaction costs, as opposed to the bid-ask spread based on pre-trade quote data. In fixed-income securities markets, pre-trade quote data are not universally available or nationally consolidated. Effective spread is calculated daily for each fixed-rate bond as the difference between the volume-weighted average dealer-to-customer buy and sell prices then averaged across bonds using equal weighting. Therefore, for each trading day, a security must have at least one customer purchase and one customer sale to be eligible for the analysis.[15] Effective spread in this paper is calculated as a percentage of the average of customer purchase price and customer sale price (mid-point customer trade price) and expressed in basis points.[16] Variable-rate municipal securities were excluded from this analysis, as they are typically traded by sophisticated institutional investors at par and with no markup. For more background on the municipal securities market or a detailed description of effective spread and transaction costs, please refer to the 2018 MSRB Research Paper.[17]

Data

For the municipal securities analysis, the RTRS database is used to derive the effective spread calculation.[18] With a few exceptions, all municipal securities trades are currently reported to MSRB's RTRS within 15 minutes of a trade.[19] The data used in this paper also relies on FINRA's Trade Reporting and Compliance Engine (TRACE) database (both trade files and bond files) for corporate bonds and agency securities. TRACE was first introduced in July 2002 for fixed income securities,

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[13] In the municipal securities market, actual transaction costs incurred by investors can also include brokers' commissions for a small percentage of agency-based trades. MSRB's Real-Time Transaction Reporting System (RTRS) converts the commission amount to the same units as dollar price and computes and disseminates a net dollar transaction price to customers inclusive of commission amount. *See* "Specifications for Real-Time Reporting of Municipal Securities Transactions," Version 4.0, October 2019.

[14] *See* Wu, Simon Z., the 2018 MSRB Research Paper.

[15] Out of 1 million or so outstanding municipal securities, roughly 18,000 municipal securities were traded daily between 2021 and 2024. Only 4,800 of those securities (27%) had both customer buy and customer sell trades on an average day.

[16] For example, if the average customer purchase price for a municipal security is 100.25 and the average customer sale price is 99.75, then the effective spread is calculated as (100.25 – 99.75) / 100 = 0.5%, or 50 basis points.

[17] *See* Wu, Simon Z., the 2018 MSRB Research Paper.

[18] MSRB complements the RTRS database with proprietary and third-party security descriptive data ("security master database"). The security master database shows an individual security's relevant characteristics, such as coupon, bond price and yield, call feature, insurance status, type of issuance, tax status and maturity date, supplement the analysis.

[19] RTRS was first implemented by MSRB in January 2005. Prior to 2005, the trade reporting system maintained by MSRB, TRS, was not a real-time trade reporting system and only required dealers to submit trades to TRS by the end of a trading day. In 2025, RTRS was amended to reduce reporting time for most trades from no later than 15 minutes to 1 minute.

including Treasury securities. However, MSRB is not a member of the Interagency Working Group (IAWG) and therefore cannot use Treasury securities data from TRACE for analyses. Thus, for this analysis, agency securities were selected due to their similar issuer and investor profiles to Treasury securities. Similar to the trade reporting of municipal securities to RTRS, excluding exceptions, all corporate bond and agency securities trades are reported to TRACE within 15 minutes of a trade.

Summary of Findings

The findings of this paper are bifurcated into two distinct sections. This first section provides a breakdown of the municipal securities market over the last decade and then analyzes the effective spread movement for the period of January 2021 through December 2024.[20] The municipal securities market analysis breaks down the trades into five trade-size groups and does so in two ways. First, the data is presented for each of the five trade-size groups: $10,000 par value or less, over $10,000 to $25,000 par value, over $25,000 to $100,000 par value, over $100,000 to less than $1,000,000 par value and $1,000,000 par value or more. The three trade-size groups with trade sizes of $100,000 or below are commonly referred to as odd-lot trades, while the $1,000,000 par value or more trade-size group is known as block trades. We define the over $100,000 to less than $1,000,000 par value trade-size group as "intermediate" trades. For the next part, the three odd-lot trade-size groups are combined into one trade-size group which is then compared with intermediate and the block trades. This breakdown is also used for the second part of the analysis comparing the effective spread between municipal securities and other fixed income securities covering the 18-month period from January 2023 through June 2024.

Overview of Municipal Securities Market in Recent Years

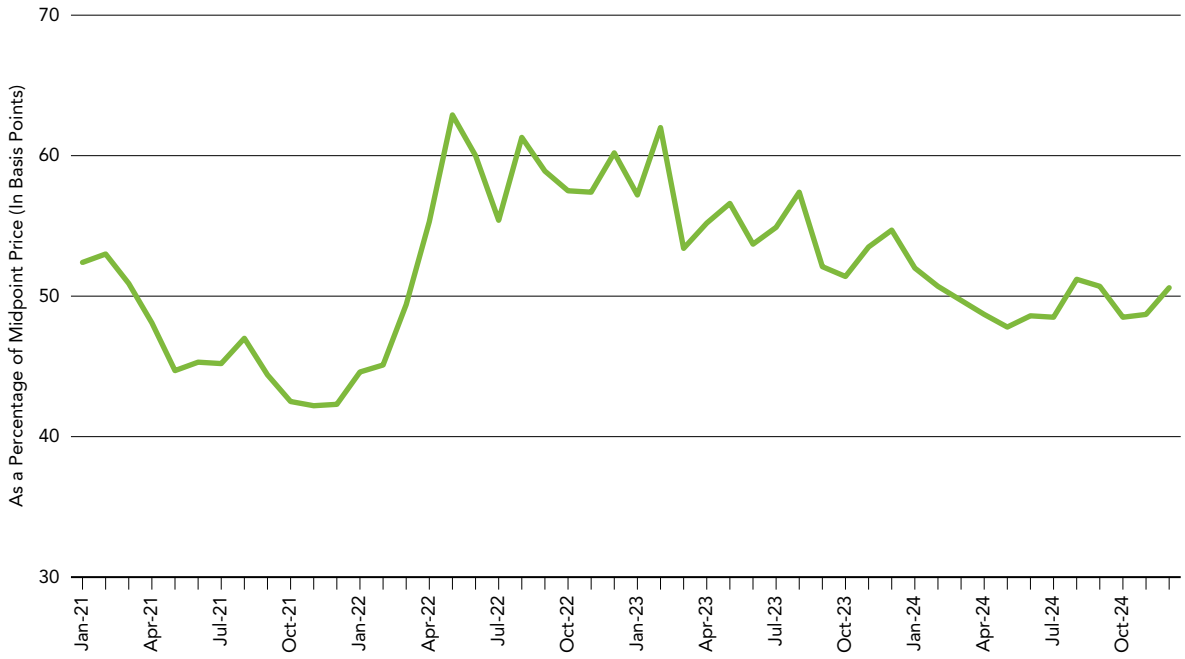
From 2009, at the peak of the financial crisis, until the end of 2021, the average effective spread for the municipal securities market declined steadily to a historical low of 42 basis points.[21] The long-term decline was briefly arrested by the June 2013 Taper Tantrum and the 2020 COVID-19 pandemic crisis, and again in early 2022 as interest rates began to rise due to rising inflation. However, the most recent increase in effective spread has persisted for much longer than for the previous episodes.

[20] Except for Table 1, which covers from January 2019 through December 2024.

[21] Please also refer to Appendix A for the average effective spread of fixed-rate municipal securities customer trades from January 2009 through December 2024, as well as the two-year and ten-year Treasury yields during the same period.

In 2022, U.S. fixed-income securities entered a bear market. The bear market resulted from rising inflation and interest rates, which coincided with increasing effective spread, reversing the long-term downward trajectory in transaction costs. Chart 1 shows that the average monthly effective spread, when measured as a percentage of the daily mid-point of customer trade prices, reached the post-pandemic high of 63 basis points in May 2022. While effective spread has declined since then, the downward slope has been gradual. By the end of 2024, the average monthly effective spread was still hovering around 50 basis points, higher than the low of 42 basis points reached in late 2021. This is not surprising considering the slow and steady decline in inflation since mid-2022[22] and the only slight decline in interest rates more recently,[23] with both yields and volatility remaining higher in 2024 than they were in 2021.

Chart 1: Effective Spread for Fixed-Rate Municipal Securities Customer Trades, January 2021–December 2024



Source: MSRB analysis with data obtained from MSRB's Real-Time Transaction Report System (RTRS) database.

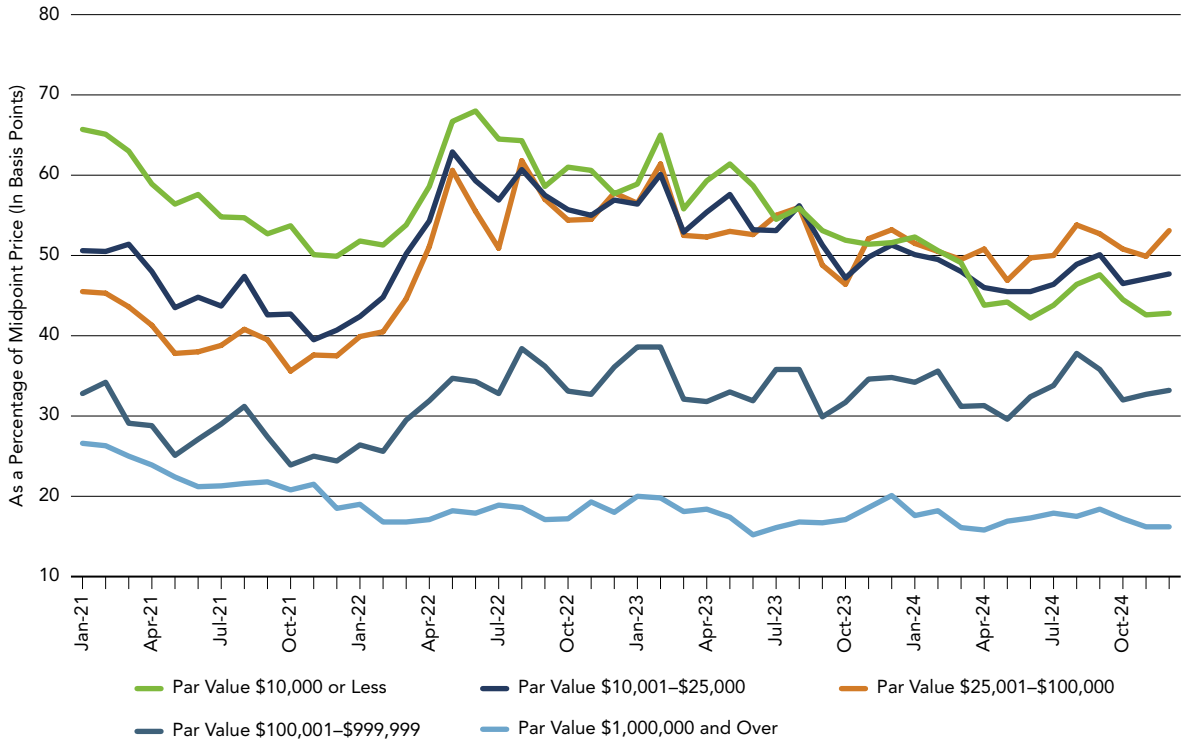
Chart 2 shows the effective spread for five trade-size groups during the relevant period and illustrates a similar pattern for most trade-size groups, including the three odd-lot groups where individual investors are predominant, with some variation in the magnitude of the change in

[22] While generally believing that markets work well and prices are flexible to adjust to the supply and demand dynamics, economists, however, observe that important prices in the economy—for example, the wage rate (or price of labor)—often seem "sticky" without adjusting rapidly to maintain equality between quantity supplied and quantity demanded. See Karl Case and Ray Fair, Principles of Economics, Pearson Prentice Hall, New York, 2007, Page 399–400.

[23] Part of the reason the decline in interest rates has lagged the decline in inflation could be the expectation that inflation may increase again in the future.

effective spread. As described in the 2023 MSRB Research Paper, all five trade-size groups experienced a rapid decline in effective spread after the 2020 COVID-19 pandemic crisis, reaching a historic low by the end of 2021 for all trade-size groups. However, four out of the five trade-size groups experienced a rise in effective spread starting in January 2022, and unlike during the COVID period, the effective spread for these four trade-size groups did not revert down quickly but stayed above the long-term trend line through the end of 2024. The one exception was the $1,000,000 par value or more trade-size group, or block trades, traditionally executed by institutional investors, which did not show an increase in effective spread between 2022 and 2024. In fact, except for a brief period in 2020 during the COVID-19 crisis, the average effective spread for the block trade-size group has been relatively stable, hovering around 20 basis points since at least 2010.[24]

Chart 2: Effective Spread for Fixed-Rate Municipal Securities Customer Trades by Trade Size, January 2021–December 2024



Source: MSRB analysis with data obtained from MSRB's RTRS database.

[24] Since only municipal securities with at least one customer buy and one customer sell for the same CUSIP number on the same trading day were included in the effective spread analysis, fewer $1,000,000 par value or more trades are included in this analysis when limiting to each trade size group. One possible reason that these large trades' effective spread has not risen since 2022 and has historically fluctuated much less than smaller-size trades' effective spread is that customer buy and sell transactions may be "arranged" by dealers, with the dealers essentially crossing the two customer orders and thus charging a smaller markup.

Overall, larger trade-size groups, such as the block customer trades group, continue to have a lower average effective spread than the three smaller odd-lot customer trades groups. In addition, the difference in effective spread between odd-lot customer trades and block customer trades remains elevated as of December 2024. While the gaps in effective spread between larger and smaller trade-size groups contracted before 2022, developments since 2022 have stalled the steady decline in effective spread for smaller trade-size groups, despite the downward trend in 2023 and 2024. Table 1 shows that the disparity in effective spread between odd-lot customer trades and block customer trades has remained at the 2020 level.

Table 1. Share of Trades by Trade Size, January 2019–December 2024

Year	Par Value $100,000 or Less	Par Value $1,000,000 and Over	Ratio
2019	72.3	17.4	4.2
2020	78.0	26.8	2.9
2021	50.0	22.9	2.2
2022	61.2	17.9	3.4
2023	58.4	17.8	3.3
2024	51.9	17.1	3.0

Source: MSRB analysis with data obtained from MSRB's RTRS database.

Finally, the analysis demonstrates that the three odd-lot customer trades groups no longer exhibited an inverse relationship between trade size and effective spread. Previously, that relationship had been a uniformly inverse one, as shown in Chart 2. The effective spreads for those three trade-size groups started converging around late 2022, with very little difference between the three trade-size groups by mid-2023. Subsequently, starting in April 2024, for the first time ever, the three odd-lot customer trades groups have demonstrated a positive relationship between trade size and effective spread. The $10,000 par value or less trade-size group had the lowest effective spread and the $25,000 to $100,000 par value group had the highest effective spread among the three groups. Because of these developments, the comparison with other fixed-income securities in the next section combines the three odd-lot customer trades groups into one group to compare the effective spread by trade size.

Comparison with Other Fixed-Income Securities

How has the effective spread for municipal securities compared, in an evolving market landscape, to that of other fixed-income markets in recent years? In this section, we compare municipal securities with corporate bonds and federal agency securities, primarily because they share some similarities to municipal securities such as overall market size, trading activities and having a mix of individual and institutional investors. As table 2 shows, the total amount of securities outstanding in 2024 was $11 trillion for the corporate bond market and $2 trillion for the agency securities

market, compared to $4 trillion for the municipal securities market.[25] In addition, the average daily par value traded in 2024 was about $49 billion for corporate bonds, $4 billion for agency securities and $13 billion for municipal securities.[26] By comparison, for Treasury securities, the largest fixed income market, the total amount of securities outstanding was $28 trillion, and the average daily par value traded was $908 billion, significantly exceeding the respective measures for corporate bonds, agency securities and municipal securities.[27]

Table 2. Fixed-Income Market Comparison, as of early 2025

Securities	Average Daily Par Value Traded	Outstanding Amount	Number of Outstanding Securities	Number of Issuers
Municipal Securities	$13 billion	$4 trillion	1,000,000	55,000
Corporate Bonds	$49 billion	$11 trillion	49,000	6,600
Agency Securities	$4 billion	$2 trillion	20,000	25
Treasury	$908 billion	$28 trillion	1,200	1

Source: MSRB analysis with data obtained from SIFMA and Bloomberg.

It is also important to note that there are major differences between municipal securities, corporate bonds and agency securities with respect to the number of issuers and securities outstanding, as shown in Table 2. For municipal securities, it is estimated that there are a total of 55,000 issuers and around 1 million outstanding securities,[28] compared to about 6,600 issuers and 49,000 outstanding securities for corporate bonds,[29] and only around 25 issuers[30] and 20,000 outstanding securities for agency securities. Therefore, market liquidity for municipal securities is more likely to be highly dispersed among numerous outstanding securities than for corporate bonds and agency securities, where there is less fragmentation. Market fragmentation and liquidity dispersion typically contribute to higher trading costs in financial markets.

[25] See SIFMA, US Fixed Income Securities Statistics, 2024, https://www.sifma.org/resources/research/statistics/us-fixed-income-securities-statistics/.

[26] *Id.*

[27] *Id.*

[28] *See* Muni Facts.

[29] As of 2025, per Bloomberg.

[30] *See* SIFMA, 2024, US-Agency-Debt-Statistics-SIFMA.xlsx. SIFMA identified the following issuers of agency securities: Fannie Mae, Freddie Mac, Farm Credit Union, Farmer Mac, Tennessee Valley Authority (TVA) and 11 Federal Home Loan Banks (FHLBs) and FHLB's Office of Finance. Other federal agencies issuing bonds include Resolution Funding Corp, Housing and Urban Development, International Development Finance Corp, Export-Import Bank, etc.

While academic research seldom compares the trading costs for municipal securities to those for other fixed income securities in the same study period,[31] in the past two decades, academic publications have consistently shown that municipal securities incur higher transactions costs than comparable corporate bonds.[32] In addition, the SEC provides a comparison of trading costs in their economic analyses related to regulatory filings such as the Regulation Best Execution Release.[33] In this analysis, the SEC compares the effective spread of seven fixed income products for the period from August 2021 through July 2022: municipal securities, corporate bonds, Treasury securities, agency securities, asset-backed securities, mortgage-backed securities and collateralized mortgage obligations.

MSRB's analysis for corporate bonds and agency securities utilizes TRACE data for the period from January 2023 through June 2024. The effective spreads for corporate bonds, agency securities and municipal securities were calculated for the same period for three trade-size buckets: $100,000 par value or less (odd-lot trades), greater than $100,000 and less than $1,000,000 par value (intermediate trades), and $1,000,000 par value or more (block trades). Before presenting the effective spread statistics, Table 3 first shows the share of each trade-size bucket for corporate bonds, agency securities and municipal securities. Overall, corporate bonds had a lower proportion of odd-lot customer trades than agency securities and municipal securities, with 72% of corporate bond trades being odd-lot trades, compared to 84% for both agency securities and municipal securities. On the other hand, corporate bonds had a higher proportion of intermediate customer trades and block customer trades than agency securities and municipal securities. This suggests a higher participation rate by institutional investors for corporate bonds than for agency securities and municipal securities.

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[31] One published paper did provide a direct comparison of effective spread between municipal securities and corporate bonds for the period from March 2004 through December 2005. See Figure 2 from Chalmers, John, Yu (Steve) Liu and Z. Jay Wang, "The Difference a Day Makes: Timely Disclosure and Trading Efficiency in the Muni Market," Journal of Financial Economics, Volume 139, Issue 1, January 2021, Pages 313–335.

[32] See Amy K. Edwards, Lawrence E. Harris, Michael S. Piwowar, "Corporate Bond Market Transaction Costs and Transparency" The Journal of Finance, Vol. 62, No. 3 (Jun., 2007), pp. 1421-1451; Burton Hollifield, Artem Neklyudov, Chester Spatt, "Bid-Ask Spreads, Trading Networks, and the Pricing of Securitizations" The Review of Financial Studies, Vol. 30, No. 9 (September 2017), pp. 3048–3085; Harris, Larry and Michael Piwowar, "Secondary Trading Costs in the Municipal Bond Market," Journal of Finance, Volume 61, 2006; and Sirri, Erik, "Report on Secondary Market Trading in the Municipal Securities Market," Municipal Securities Rulemaking Board, July 2014. It should be noted that each paper may have different methodology when calculating the aggregate effective spread so that an apple-to-apple comparison may not be feasible.

[33] *See* Release No. 34-96496 (December 14, 2022), 88 FR 5440 (January 27, 2023) File No. S7-32-22. The Commission's Division of Economic and Risk Analysis' analysis of data from August 1, 2021 through July 31, 2022, available at https://www.sec.gov/files/rules/proposed/2022/34-96496.pdf.

Table 3. Share of Trades by Trade Size, January 2023–June 2024

By Par Value	Corporate Bonds	Agency Securities	Municipal Securities
$100,000 or Less	71.7%	84.0%	84.0%
$100,001 - $999,999	17.3%	9.8%	12.7%
$1,000,000 and Over	11.0%	6.1%	3.3%
All Trades	**100.0%**	**100.0%**	**100.0%**

Source: MSRB analysis with data obtained from MSRB's RTRS database and TRACE Data provided by FINRA's TRACE System.

Table 4 presents the average and median trade size for each trade-size bucket. For the $1,000,000 or more trade-size bucket, TRACE has transaction size caps for public dissemination, with the caps being $5 million for investment grade securities and $1 million for non-investment grade securities.[34] Therefore, only median statistics were shown for that size bucket in Table 4. Overall, municipal securities had higher average and median trade sizes for odd-lot customer trades than corporate bonds and agency securities. On the other hand, municipal securities had lower average and median trade sizes for intermediate customer trades than corporate bonds and agency securities, and lower median trade sizes for block customer trades. Still, despite the differences, the variations in trade size within each bucket were not dramatic across fixed income markets.

Table 4. Average and Median Trade Size, January 2023–June 2024

By Par Value	Corporate Bonds		Agency Securities		Municipal Securities	
	Average	Median	Average	Median	Average	Median
$100,000 or Less	22,295	10,000	26,757	20,000	31,201	25,000
$100,001–$999,999	342,014	253,000	311,029	250,000	272,465	200,000
$1,000,000 and Over*		2,205,000		2,492,000		2,000,000
All Trades	**498,294**	**25,000**	**612,943**	**25,000**	**205,320**	**25,000**

Source: MSRB analysis with data obtained from MSRB's RTRS database and TRACE Data provided by FINRA's TRACE System.

Considering their differences in market structure, types of investors and security characteristics, transaction costs as measured by effective spread are noticeably higher for municipal securities than they are for other fixed income securities, especially for smaller-sized trades. Table 5 below illustrates that for all trades, the average effective spread for municipal securities (as a percentage

[34] Trades over the cap are reported as "5MM+" or "1MM+." In addition, historically, FINRA would make the uncapped trade quantities available with a lag of 18 months, but in 2017, FINRA reduced that lag to 6 months for corporate bonds and agency securities. See https://www.sec.gov/files/rules/sro/finra/2017/34-80685.pdf.

of trade price) was 53 basis points, as compared to 36 basis points for corporate bonds and 40 basis points for agency securities. In addition, transaction costs also vary by trade size for all fixed income securities, with trade size and effective spreads having an inverse correlation and smaller trades generally having higher effective spreads than larger trades. As Table 5 shows, smaller trades in municipal securities had significantly higher effective spreads than larger trades during the period analyzed, at 56 basis points for odd-lot customer trades and less than 18 basis points for block trades. In addition, the difference in spreads between odd-lot customer trades and block customer trades was more pronounced for municipal securities (38 basis points) than for corporate bonds (25 basis points) and slightly higher compared to agency securities (32 basis points).[35]

Table 5. Effective Spread by Trade Size, in Basis Points of Security Price, January 2023–June 2024

By Par Value	Corporate Bonds	Ageny Securities	Municipal Securities
$100,000 or Less	46.6	45.5	56.1
$100,001 - $999,999	21.0	23.2	33.3
$1,000,000 and Over	21.2	13.3	17.6
All Trades	**36.3**	**40.1**	**52.9**

Source: MSRB analysis with data obtained from MSRB's RTRS database and TRACE Data provided by FINRA's TRACE System.

It should be noted that unlike fixed income markets, in the equity market, smaller-sized customer trades generally have lower effective spreads than larger-sized customer trades for both market orders and marketable limit orders.[36] This is likely due to the historical differences in market structure, regulatory frameworks and product characteristics between these two markets.

[35] A large proportion of odd-lot customer trades are executed by individual investors. On the other hand, almost all block customer trades are executed by institutional investors. See Bagley, John A and Marcelo Vieira, "Convergence of Individual and Institutional Trading Dynamics in Small Size Trades," MSRB Research Paper, February 2025.

[36] Academic publications going back to the 1980s and 1990s already affirmed the positive correlation between the trade size for the effective spread. For example, a 1995 paper (Lin, Sanger and Booth) examined the 150 stocks listed on the New York Stock Exchange and found that the average effective spread (in dollar or in percentage) increased monotonically with trade size. See Ji-Chai Lin, Gary C. Sanger, G. Geoffrey Booth, "Trade Size and Components of the Bid-Ask Spread," The Review of Financial Studies, Vol. 8, No. 4 (Winter, 1995), pp. 1153–1183. In addition, MSRB conducted an internal analysis that calculated the effective spread for the 166 most frequently traded stocks or ETFs, using the Securities and Exchange Commission's Rule 605 data for the relevant period from January 2023 through June 2024. The analysis showed that smaller-sized trades generally have lower effective spreads than larger-sized trades for both market orders and marketable limit orders.

Conclusion

After a nearly 12-year-long steady decline in customer trading costs in the municipal securities secondary market starting with the end of the 2008 financial crisis, the downward trend has been interrupted in recent years. The municipal securities market has witnessed two abrupt upsurges in customer trading costs since 2020, one during the 2020 COVID-19 market crisis and the other starting in 2022 when inflation spiked and interest rates began to rise. But unlike the 2020 COVID-19 market crisis, the increase in customer trading costs since 2022, as measured in effective spread, has lasted much longer. By the end of 2024, the average monthly effective spread was approximately 50 basis points, still higher than the low of 42 basis points reached in late 2021. This is not surprising considering the slow but steady decline in inflation starting in mid-2022 and the only slight decline in interest rates more recently, with yields and volatility staying higher in 2024 than in 2021. In addition, the difference in effective spread between odd-lot customer trades and block customer trades remains substantial as of December 2024. While the difference in effective spread between smaller odd-lot trades and larger block trades was previously shrinking, the recent development since 2022 seems to have stalled the progress smaller trade-size groups made previously. As a result, the disparity in effective spread between odd-lot customer trades and block customer trades has remained at the 2020 level.

The average effective spread for municipal securities (as a percentage of trade price) was 53 basis points in 2024, compared to 36 basis points for corporate bonds and 40 basis points for agency securities. This is likely because the municipal securities market has substantially more outstanding securities than the corporate bond and agency securities markets, with the ratio of outstanding securities at 20 to 1 between municipal securities and corporate bonds, and 50 to 1 between municipal securities and agency securities as of 2024. Therefore, liquidity for corporate bonds and agency securities is more concentrated than it is for municipal securities, and more outstanding securities and issuers likely contributed to the wider effective spreads for municipal securities than for corporate bonds and agency securities. In addition, while smaller trades generally have higher effective spreads than larger trades for all fixed income markets, the difference in spreads was more pronounced for municipal securities (38 basis points) than for corporate bonds (25 basis points) and slightly higher compared to agency securities (32 basis points).

In summary, odd-lot customer trades in municipal securities continue to have a higher effective spread than larger-size customer trades, as well as comparable-size customer trades in other fixed-income securities, and those gaps have not shrunk much in recent years. The obvious question is whether any potential change in market structure may help further reduce transaction costs for odd-lot customer trades relative to other types of customer trades.[37] Further research would be needed to investigate this possibility.

[37] Odd-lot customer trades may not entirely be initiated by individual investors, as the growth of separately managed accounts (SMA) accounts means many odd-lot trades are also conducted by SMA accounts.

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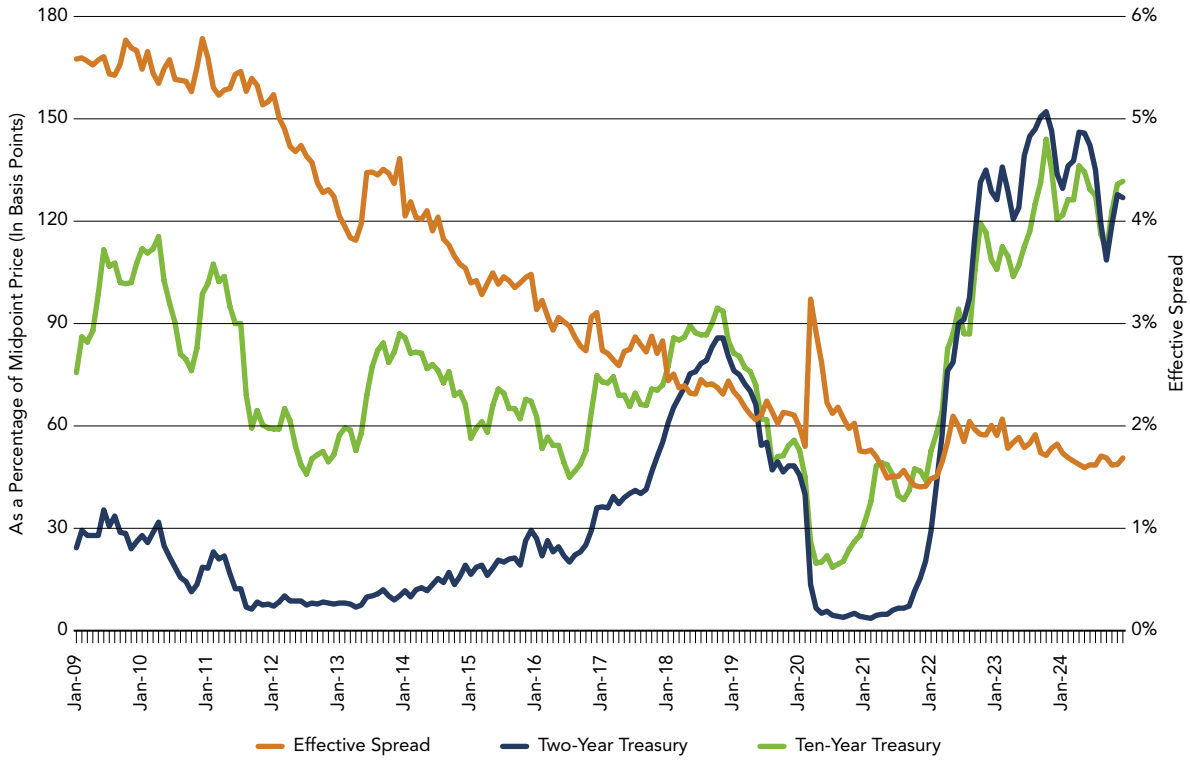
Appendix A

Effective Spread for Fixed-Rate Municipal Securities Customer Trades, Two-Year Treasury and Ten-Year Treasury Yields (January 2009–December 2024)



Source: MSRB analysis with data obtained from MSRB's RTRS database and the Board of Governors of the Federal Reserve System.

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