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CONTENTS

- 2 Abstract
- 3 Trade Data Used and Methodology
- 3 Municipal Market Trading Activity Overview
- 4 Overall Trends by Trade Size and Trade Type, 2010–2020
- Trends in the Tax-Exempt, Fixed-Rate Market
- 11 Market Disruption in 2020
- 12 Conclusion

Abstract1

MSRB analysis of municipal securities trade data shows a noticeable shift in market behavior and structure since 2010, driven by customer purchasing patterns. During the period between 2010 and 2020, transactions of \$100,000 or less decreased as a percentage of the overall market while transactions of over \$1 million increased. In both cases, the trends apply to the number of transactions and to par amount traded. The analysis shows that changes in trade patterns of customer purchases specifically drove most of the decrease in trades of \$100,000 or less, as well as the corresponding increase in trades of over \$1 million.²

There were notably more customer purchases of over \$1 million and notably fewer customer purchases of \$100,000 or less over the past decade, while customer sales and interdealer trades remained relatively stable. It is possible that increased use of separately managed accounts (SMAs), mutual funds and exchange-traded funds (ETFs) has replaced some direct individual investor transactions, driving the shift in the size of customer purchases. Even among customer purchases of \$100,000 or less, the smallest trade sizes had the largest decreases in number of trades. To illustrate these trends, this paper will analyze changing trade patterns among customer purchases by trade size.

This report will largely focus on trades of fixed-rate, tax-exempt municipal securities, though it includes analysis of all trades in the overall municipal market, as well. Fixed-rate, tax-exempt municipal securities represented between 87% and 92% of all trades each year since 2010. By excluding variable-rate and taxable securities, the trends observed in trade size patterns in the overall market are further highlighted.³ Analyzing fixed-rate, tax-exempt trades alone demonstrates the scale of changes among both smaller trades of \$100,000 or less and larger trades of \$1 million or more over the past decade. In 2010, the 3.8 million customer purchases of fixed-rate, tax-exempt securities of \$100,000 or less accounted for 87.2% of all customer purchases of those securities. By 2020, that number decreased to 2.0 million, or 77.8% of all customer purchases. For larger block trades of over \$1 million, there were 83,787 customer purchases, or 1.9% of the total, in 2010, and 121,991 customer purchases, or 4.6% of the total, in 2020.

- ¹ The views expressed in this research paper are those of the authors and do not necessarily reflect the views and positions of the MSRB.
- For additional information and market data, please visit <u>MSRB.org</u> and <u>EMMA Market Statistics</u>.
- Variable-rate and taxable securities are unique categories of municipal securities that are typically transacted by different types of investors and for different purposes than more standard tax-exempt fixed-rate securities.

Trade Data Used and Methodology

This report is based on transaction data from the MSRB's Real-Time Transaction Reporting System (RTRS) database. The dataset used consists of approximately 105 million trades between 2010 and 2020, excluding commercial paper. Throughout the report, data is segmented based on trade size, trade type (customer purchases, customer sales, or interdealer trades), taxable status, and coupon type (fixed-rate, zero-coupon, or variable-rate). Trades of \$100,000 or less are commonly categorized as individual investor-sized trades, while trades of over \$1 million are referred to as institutional-sized trades. This report will use that convention.

Municipal Market Trading Activity Overview

From 2010 through 2020, the number of municipal securities trades ranged from 8.3 million to 10.6 million annually, with 10.4 million total trades in 2010 and 8.5 million total trades in 2020. Total annual par value traded has ranged from \$2.2 trillion to \$3.3 trillion, with \$3.3 trillion traded in 2010 and \$2.9 trillion traded in 2020. Although the total par amount traded in 2020 was less than in 2010, 2020 saw the highest volume of par traded since 2010, following the generally increasing trend that began after the lows of 2015. As to trading activity, though 2020 volumes were lower than those in 2010, there was some variability in the years between (see Figure 1).

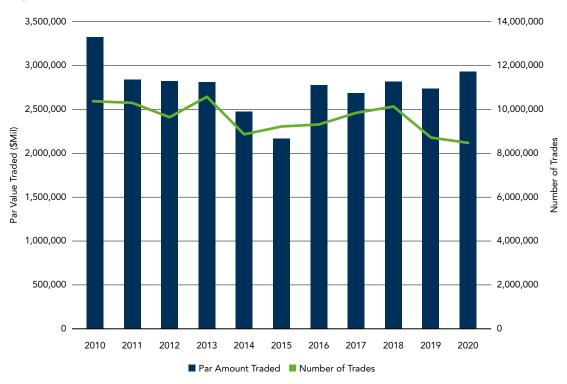


Figure 1. Annual Par Value Traded and Number of Trades, 2010–2020*

*Includes all types of municipal securities: fixed-rate, tax-exempt, as well as variable-rate and taxable municipal securities.

3

Overall Trends by Trade Size and Trade Type, 2010–2020

MSRB analysis demonstrates that the type and size of transactions of municipal securities has changed over the past 11 years. Individual investor-sized trades of \$100,000 or less decreased since 2010, both in number of trades and as a percentage of the market. Simultaneously, institutional-sized trades of over \$1 million increased. In 2020, there were 9% more institutional-sized trades of all municipal securities than in 2010 and 22% fewer individual investor-sized trades.⁴

In 2010, 8.5 million trades (82% of all trades) were individual investor-sized, while about 388,000 (3.7%) were institutional-sized. The total number of individual investor-sized trades of municipal securities reached its lowest point since 2010 in 2020. As a proportion of total trades, individual investor-sized trades decreased overall, albeit with some variability, hitting the lowest point in 2020. In 2020, the number of trades of \$100,000 or less was 6.6 million, 22% lower than in 2010 (see Figure 2).

Meanwhile, the number of trades of over \$1 million in 2020 amounted to about 423,000, 9% higher than in 2010. The annual number of institutional-sized trades reached its lowest point of the decade in 2015 with about 300,000 trades, accounting for 3.3% of the overall market, and has been increasing since then, reaching 5.0% of the market in 2020 (see Figure 3).

In terms of par amount traded, in 2010 \$276 billion (8.3% of all par traded) was individual investor-sized, while \$2.54 trillion (76%) was institutional-sized. In 2020, par amount traded in institutional-sized trades was at its highest levels since 2010, while par amount traded in individual investor-sized trades was at its lowest (see Figures 2 and 3). However, neither has followed a consistent pattern as a market-wide percentage of all par value traded.

Figure 2. Overall Market—Individual Investor-Sized Trades of Municipal Securities, 2010–2020*

	Trades of \$100,000 or Less					
	Number of Trades		Par A	Amount Traded		
	Total Number	Percent of All Trades	Total Par (\$Mil)	Percent of All Par Traded		
2010	8,511,798	82.0%	\$275,879	8.3%		
2011	8,544,527	83.0%	\$272,196	9.6%		
2012	7,825,929	81.2%	\$258,455	9.2%		
2013	8,807,872	83.3%	\$281,647	10.0%		
2014	7,237,220	81.6%	\$233,534	9.4%		
2015	7,533,322	81.7%	\$246,496	11.4%		
2016	7,481,800	80.3%	\$249,913	9.0%		
2017	7,961,265	80.9%	\$262,836	9.8%		
2018	8,217,496	81.1%	\$271,935	9.7%		
2019	6,865,591	78.8%	\$225,083	8.2%		
2020	6,627,021	78.2%	\$210,991	7.2%		

*Includes all types of municipal securities: fixed-rate, tax-exempt, as well as variable-rate and taxable municipal securities.

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Note that, while this paper analyzes overall trends in the municipal securities market, many factors may drive certain fluctuations in annual trading volumes, including, but not limited to, interest rates, equities and mutual fund flows.

Figure 3. Overall Market—Institutional-Sized Trades of Municipal Securities, 2010–2020*

	Trades of More than \$1 Million				
	Number of Trades		Par Amount Traded		
	Total Number	Percent of All Trades	Total Par (\$Mil)	Percent of All Par Traded	
2010	387,534	3.7%	\$2,540,716	76.4%	
2011	342,047	3.3%	\$2,087,316	73.5%	
2012	348,526	3.6%	\$2,067,638	73.2%	
2013	348,806	3.3%	\$2,060,451	73.2%	
2014	320,503	3.6%	\$1,799,481	72.7%	
2015	300,407	3.3%	\$1,450,309	67.0%	
2016	363,289	3.9%	\$2,028,018	73.0%	
2017	366,098	3.7%	\$1,910,156	71.0%	
2018	379,134	3.7%	\$2,036,038	72.3%	
2019	391,497	4.5%	\$2,014,539	73.5%	
2020	423,474	5.0%	\$2,219,727	75.7%	

^{*}Includes all types of municipal securities: fixed-rate, tax-exempt, as well as variable-rate and taxable municipal securities.

While the trend is notable for all types of trades, the results of the analysis show that the trend toward larger trades and away from smaller, individual investor-sized trades is particularly notable among customer purchases. Trading patterns in customer sales and interdealer trades remained relatively consistent in the past decade as shown in Figures 4, 5, 6 and 7.

Trends in the Tax-Exempt, Fixed-Rate Market

As noted earlier, the overall trend of reduced numbers and market share of smaller trades, as well as increased numbers and market share of larger trades over time is significantly more pronounced when the analysis is limited to tax-exempt, fixed-rate securities. The following analysis and results exclude variable-rate and taxable securities, given that these segments represent less common types of securities and trades in the municipal market.

In 2010, customer purchases of tax-exempt, fixed-rate securities accounted for 48% of trades in the municipal securities market, while customer sales and interdealer trades accounted for 20% and 32%, respectively. By 2020, customer purchases accounted for 36% of trades, with customer sales and interdealer trades increasing to 25% and 38%, respectively. The downward trend was driven by a consistent decrease in customer purchases of \$100,000 or less trades. The number of individual investor-sized customer purchases decreased by 46% between 2010 and 2020, from 3.8 million to 2.0 million. Par traded in individual investor-sized trades also decreased in this time, by 43% from \$116

⁵ Customer sales notably increased as a proportion of trades in 2020 due to a surge in customer sales in March and April related to market turmoil due to the COVID-19 outbreak in the U.S. Prior to 2020, customer sales remained consistent at around 20–22% of trades, while interdealer trades maintained a higher proportion of 38-40% of trades since 2015.

million in 2010 to \$66 million in 2020. As illustrated in Figure 4, the significant decrease in individual investor-sized customer purchases occurred during a time of modest volatility and a proportional increase in interdealer trades of the same size, particularly since 2014. Despite the decrease in customer purchases, interdealer trades and customer sales have remained relatively stable.

Figure 4. Annual Number of Fixed-Rate, Tax-Exempt Trades of \$100,000 or Less by Trade Type, 2010–2020

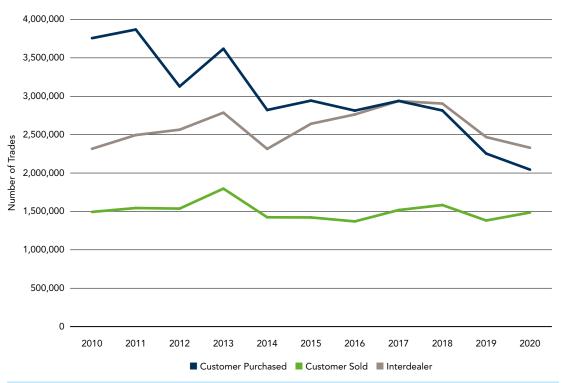


Figure 5. Annual Number and Par Value of Fixed-Rate Tax-Exempt Customer Purchases of \$100,000 or Less, 2010–2020

	Number of Trades	% of Trades*	Par (\$Mil)	% of Par*
2010	3,756,800	87.2%	\$116,341	16.4%
2011	3,869,054	87.7%	\$116,128	17.7%
2012	3,127,904	84.5%	\$98,891	14.2%
2013	3,619,228	86.5%	\$112,130	15.7%
2014	2,821,170	84.4%	\$90,143	14.1%
2015	2,943,378	83.2%	\$96,684	14.0%
2016	2,813,193	81.2%	\$95,447	12.2%
2017	2,938,990	81.9%	\$98,995	12.8%
2018	2,814,600	82.2%	\$95,273	13.1%
2019	2,253,622	78.8%	\$76,711	10.6%
2020	2,044,506	77.8%	\$66,156	8.3%

^{*&}quot;All Trades" and "Par" refer only to fixed-rate, tax-exempt customer purchases of all sizes

The pattern is opposite among institutional-sized trades, where customer purchases increased the most of all trade types between 2010 and 2020. Institutional-sized customer purchases drove the growth seen among all trades of over \$1 million, while customer sales and interdealer trades remained relatively flat. Even though customer purchases decreased overall between 2010 and 2020, institutional-sized customer purchases increased by 46% in that same time period, from 83,787 trades in 2010 to 121,991 in 2020, and par value traded in institutional-sized customer purchases increased by 28% (see Figures 6 and 7).

There were more than 15 times more individual investor-sized customer purchases than institutional-sized customer purchases in any given year over the last decade, so trends among institutional-sized customer purchases are less evident in the broad statistics. The decrease in overall customer purchases as a share of municipal securities trades is driven by individual investor-sized trades and is not reflective of trends among institutional-sized customer purchases.

Figure 6. Annual Number of Fixed-Rate, Tax-Exempt Trades of More Than \$1,000,000 by Trade Type, 2010–2020

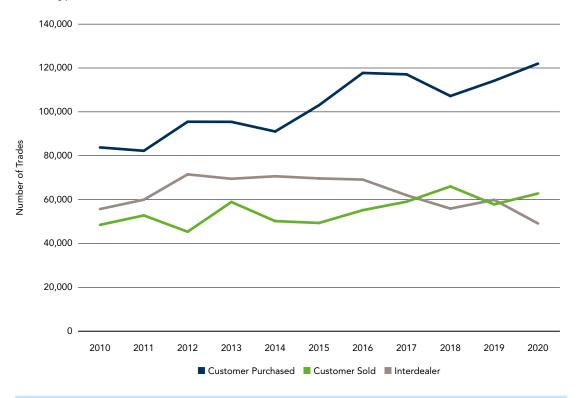


Figure 7. Annual Number and Par Value of Fixed-Rate Tax-Exempt Customer Purchases of More Than \$1 Million, 2010–2020

	Number of Trades	% of Trades*	Par (\$Mil)	% of Par*
2010	83,787	1.9%	\$444,068	62.6%
2011	82,255	1.9%	\$394,646	60.1%
2012	95,499	2.6%	\$439,615	63.3%
2013	95,455	2.3%	\$452,076	63.3%
2014	91,056	2.7%	\$406,774	63.7%
2015	103,025	2.9%	\$431,451	62.5%
2016	117,743	3.4%	\$505,989	64.8%
2017	117,099	3.3%	\$494,255	64.0%
2018	107,225	3.1%	\$469,825	64.6%
2019	114,179	4.0%	\$482,113	66.7%
2020	121,991	4.6%	\$568,173	71.4%

^{*&}quot; Trades" and "Par" refer only to fixed-rate, tax-exempt customer purchases of all sizes

As mentioned earlier, customer purchases of \$100,000 or less saw significant decreases in trading volumes between 2010 and 2020, with 46% fewer transactions overall. Further analysis shows that the decline was most pronounced for trades of \$25,000 or less, which decreased by 49% (see Figure 8). In general, the smaller the trade-size segment, the larger the decrease in trades between 2010 and 2020 among individual investor-sized customer purchases. While trades of \$100,000 or less are categorized as individual investor-sized trades in this report, based on a generally accepted threshold in the industry, institutional transactions can certainly be less than \$100,000. Assuming that the smaller the trade, the more likely the purchaser is an individual investor, the trade-size breakdown in Figure 8 demonstrates that trades of \$25,000 or less account for most of the decrease in trades by individual investors.

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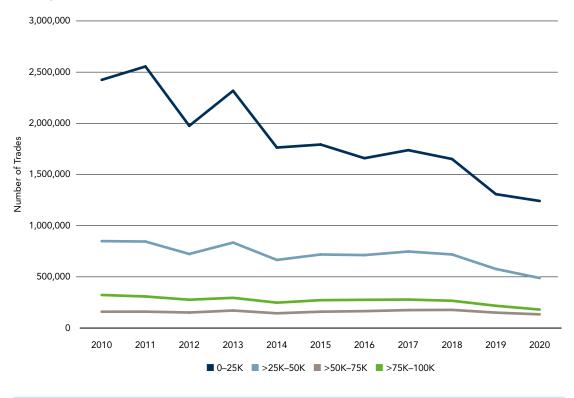


Figure 8. Annual Number of Fixed-Rate, Tax Exempt Customer Purchases of \$100,000 or Less by Trade Size, 2010–2020

Despite the overall decrease in number of trades, overall par value traded in customer purchases increased by 12% from 2010 to 2020. The overall average trade size of customer purchases increased by 84%, from \$164,718 in 2010 to \$302,512 in 2020 as shown in Figure 9. Additionally, the average trade size for individual investor-sized customer purchases increased to \$32,358 in 2020 from \$30,968 in 2010, while the average trade size of institutional-sized customer purchases decreased 12% in the same period. Given that institutional-sized transactions accounted for 64% of overall par traded from 2010 to 2020 and individual investor-sized transactions accounted for 84% of all trades, the overall increase in average trade size for customer purchases was driven by two main factors: the increase in institutional-sized transactions and the decrease in individual investor-sized transactions since 2010.

Figure 9. Annual Average Trade Size of Fixed-Rate Tax-Exempt Customer Purchases, by	y
Trade Size	

	All Customer Purchases		Individual Investor-Sized Customer Purchases		Institutional-Sized Customer Purchases				
	Par Amount Traded (\$Mil)	Number of Trades	Avg. Trade Size	Par Amount Traded (\$Mil)	Number of Trades	Avg. Trade Size	Par Amount Traded (\$Mil)	Number of Trades	Avg. Trade Size
2010	\$709,932	4,309,993	\$164,718	\$116,341	3,756,800	\$30,968	\$444,068	83,787	\$5,299,962
2011	\$656,901	4,411,697	\$148,900	\$116,128	3,869,054	\$30,015	\$394,646	82,255	\$4,797,833
2012	\$694,459	3,700,411	\$187,671	\$98,891	3,127,904	\$31,616	\$439,615	95,499	\$4,603,351
2013	\$714,311	4,184,698	\$170,696	\$112,130	3,619,228	\$30,982	\$452,076	95,455	\$4,736,014
2014	\$638,299	3,344,304	\$190,862	\$90,143	2,821,170	\$31,952	\$406,774	91,056	\$4,467,300
2015	\$690,688	3,539,112	\$195,159	\$96,684	2,943,378	\$32,848	\$431,451	103,025	\$4,187,830
2016	\$780,339	3,463,086	\$225,330	\$95,447	2,813,193	\$33,928	\$505,989	117,743	\$4,297,398
2017	\$772,195	3,588,526	\$215,184	\$98,995	2,938,990	\$33,683	\$494,255	117,099	\$4,220,834
2018	\$727,432	3,424,995	\$212,389	\$95,273	2,814,600	\$33,850	\$469,825	107,225	\$4,381,676
2019	\$723,124	2,858,317	\$252,989	\$76,711	2,253,622	\$34,039	\$482,113	114,179	\$4,222,428
2020	\$795,396	2,629,303	\$302,512	\$66,156	2,044,506	\$32,358	\$568,173	121,991	\$4,657,500

Undoubtedly, there has been a significant and quantifiable change in customer purchasing behavior in the municipal market over the past decade. There are a number of factors that may provide more context for the decrease in the number of individual investor-sized customer purchases and the increase in institutional-sized purchases. One likely explanation is the possible increase in the use of SMAs. In an SMA, one larger transaction from an asset management firm may replace many smaller-sized individual investor trades that were more common several years ago. The large transaction by the asset management firm counts as only one trade, though the securities purchased are subsequently allocated to numerous accounts. Market research suggests that the number of SMAs has nearly tripled since 2010.6 If that is the case, SMA usage may explain much of this change in customer activity. Potential individual investors may be increasingly opting for SMAs instead of more traditional brokerage accounts.

Another possible explanation for these patterns is the increase in use of mutual funds and ETFs by individual investors. Financial holdings data made available by the Federal Reserve indicate that municipal bond holding patterns also changed over the past decade, simultaneously to the changes in trading behavior. While municipal bond holdings of households and nonprofit organizations remained relatively stable between 2010 and 2020, municipal bond holdings in mutual funds increased by 73% (\$358 billion), and municipal bond holdings in ETFs increased by 669% (\$51 billion). The increase in holdings since

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10

See Healy, Patricia, "<u>The Rise of Municipal Separately Managed Accounts—2020 Update</u>," Cumberland Advisors, September 15, 2020.

Federal Reserve Board Financial Accounts of the United States. December 10, 2020. Also, see "Municipal Bond ETFs: Liquidity Impact on the Municipal Bond Market," Municipal Securities Rulemaking Board, April 2018.

2010 may help explain both the increase in institutional-sized purchases and the decrease in individual investor-sized purchases as mutual funds and ETFs increased their share of the market, along with SMAs.

Market Disruption in 2020

Though 2020 saw significant market disruption, especially concentrated in March and April due to the initial COVID-19 outbreak in the United States, the trends identified in this paper continued. The trend toward more institutional-sized customer purchases and away from individual investor-sized customer purchases has been consistent since at least 2015. Despite the significant market-wide increase in trading activity in late March and early April 2020, the spike in trades was proportionate across the market and the trends observed in 2019 continued through 2020. As the number of trades and par amount traded reached record-high volumes, individual investor-sized trades still represented 79% of trades and 8% of par value traded among customer purchases in March 2020. Institutional-sized trades represented 5% of trades and 75% of par value traded among customer purchases in March. In general, market behavior remained consistent throughout 2020. When there were spikes in trading volumes, all segments of the market increased proportionately, and those proportions were relatively consistent with existing trends (see Figures 10 and 11.)

As occurs each year, there was some variation in the movement and size of the trends. In terms of number of trades and par amount traded, the decrease in individual investor-sized trades and increase in institutional-sized trades was slightly larger in 2020 than recent year-to-year changes (see Figures 5 and 7). For institutional-sized trades, average trade size was also notably higher in 2020 than in 2019, perhaps related to changed trading behavior in the COVID-19-related market disruption (see Figure 9).

Figure 10. Monthly Number and Par Value of Fixed-Rate Tax-Exempt Customer Purchases of \$100,000 or Less, 2020

	Number of Trades	% of Trades*	Par (\$Mil)	% of Par*
Jan-20	161,534	78.8%	\$5,383	9.0%
Feb-20	141,485	76.9%	\$4,710	7.7%
Mar-20	266,329	79.1%	\$8,798	7.6%
Apr-20	225,969	79.5%	\$7,209	8.9%
May-20	179,155	77.0%	\$5,740	8.2%
Jun-20	172,121	75.9%	\$5,536	7.9%
Jul-20	161,173	77.1%	\$5,117	8.1%
Aug-20	139,927	76.8%	\$4,437	7.1%
Sep-20	149,257	76.9%	\$4,760	8.3%
Oct-20	160,070	76.6%	\$5,152	7.7%
Nov-20	133,091	79.0%	\$4,306	11.0%
Dec-20	154,395	78.4%	\$5,009	10.4%

 $[\]star$ "All Trades" and "Par" refer only to fixed-rate, tax-exempt customer purchases of all sizes

Figure 11. Monthly Number and Par Value of Fixed-Rate Tax-Exempt Customer Purchases of Over \$1 Million, 2020

	Number of Trades	% of Trades*	Par (\$Mil)	% of Par*
Jan-20	8,671	4.2%	\$42,681	71.0%
Feb-20	8,456	4.6%	\$44,287	72.0%
Mar-20	16,056	4.8%	\$86,990	74.8%
Apr-20	12,613	4.4%	\$56,959	70.7%
May-20	10,983	4.7%	\$45,196	64.9%
Jun-20	11,070	4.9%	\$46,285	66.2%
Jul-20	9,610	4.6%	\$44,040	69.5%
Aug-20	8,734	4.8%	\$44,124	71.0%
Sep-20	9,444	4.9%	\$40,153	70.3%
Oct-20	11,802	5.6%	\$51,495	76.6%
Nov-20	6,582	3.9%	\$29,430	75.1%
Dec-20	7,970	4.0%	\$36,533	75.7%

^{*&}quot;All Trades" and "Par" refer only to fixed-rate, tax-exempt customer purchases of all sizes

Conclusion

Changes in market structure drove noticeable shifts in customer purchase patterns for small and large transactions of municipal securities since 2010. Trades of municipal securities of \$100,000 or less decreased, while trades of over \$1 million increased. This trend is particularly notable among customer purchases of fixed-rate, tax-exempt municipal securities. In fact, it is those customer purchases that skewed the trend among all trades, while customer sales and interdealer transactions remained relatively stable. Even amidst the market turmoil of 2020, including unprecedented price movements, trade volumes and mutual fund outflows in March and record low short-term rates in August, the trend continued through the year. Individual investors made fewer direct purchases of municipal securities, while institutional customers made more purchases since 2010, both in the number and par amount of trades and as a percentage of the market. While different factors may be driving this change in behavior, the increased use of SMAs, mutual funds and ETFs may be replacing some direct individual investor transactions.

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