

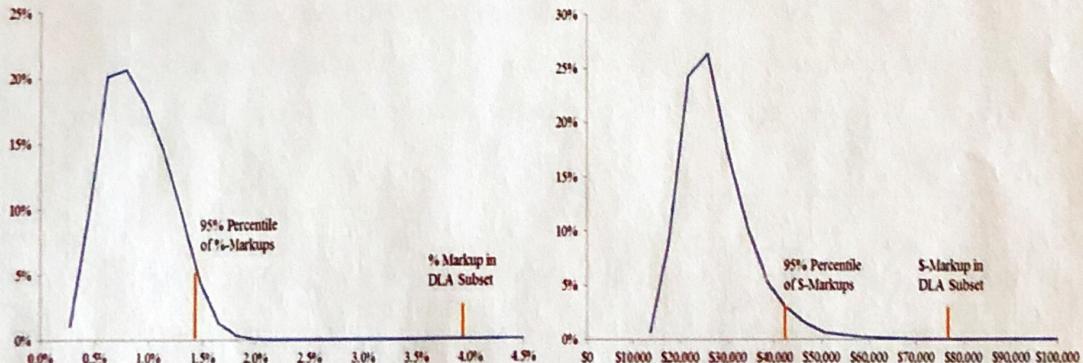
and so the further decline in median markups from to 1.25% in bonds issued after January 1, 2005 and to 1.02% in our entire sample may be the result of declining yields and not a continuing benefit of improved transparency.

IV. Excessive Markups in Individual Portfolios

The distributions of weighted average percentage markups and dollar markups in Figure 2 and Figure 3 can be drawn for subsets of the EMMA trade data and used to assess the unusualness of observed markups in an investor's accounts or in groups of accounts serviced by the same brokerage firm or advisor. To illustrate, we select 10,000 random samples of 50 trades each which have similar characteristics to a set of 50 trades selected from the trades reported in the FINRA v David Lerner Associates case. We filtered the trades by time period, size and remaining maturity to match the characteristics of the trades in the DLA case.

Figure 5 plots the distribution of weighted average percentage markups and \$-markups from the 10,000 samples of 50 bonds each. The 4.0% weighted average markup charged on DLA trades we analyze is at the 99.99th percentile in the distribution of percentage markups on similar bond trades. The \$78,000 in markups charged in the subset of DLA trades we analyze is more than three times the \$23,900 median markup and is at the 98.2nd percentile in the distribution of dollar markups on similar bond trades.

Figure 5: Assessment of FINRA v DLA Markups in Weighted Average Percentage and Aggregate Dollar Markups.



V. Examples of Excessive Markups Identifiable by Inspection

We review four examples of excessive markups before we report our systematic assessment of markups.

City of Commerce, California Infrastructure Bond, CUSIP 20058RBA

Our first example is from trading in a City of Commerce, California infrastructure bond listed in Table 4.¹⁵ On January 17, 2013 a customer bought \$1,450,000 for \$101.36 that had just been sold 4 minutes earlier for \$99.00. Compared to the average inter-dealer trade price that day of \$99.22, the investor paid a \$30,909 markup. The median markup on a purchase of this size of 0.075% would have generated \$1,077. This investor was charged nearly 30 times the median markup.

Table 4 City of Commerce, California

Trade Date/Time	Settlement Date	Price	Yield (%)	Trade Amt (\$)	Trade Submission Type
01/17/2013 : 09:24 AM	2/1/2013	\$100.88	3.493	\$50,000	Customer bought
01/17/2013 : 10:12 AM	2/1/2013	\$100.48	3.541	\$50,000	Customer bought
01/17/2013 : 12:51 PM	2/1/2013	\$99.19	3.652	\$1,450,000	Inter-dealer Trade
01/17/2013 : 12:52 PM	2/1/2013	\$99.88	3.607	\$20,000	Customer bought
01/17/2013 : 12:57 PM	2/1/2013	\$99.25	3.648	\$1,450,000	Inter-dealer Trade
01/17/2013 : 01:39 PM	2/1/2013	\$101.37	3.435	\$50,000	Customer bought
01/17/2013 : 01:39 PM	2/1/2013	\$99.38	3.639	\$50,000	Inter-dealer Trade
01/17/2013 : 01:39 PM	2/1/2013	\$99.38	3.639	\$50,000	Inter-dealer Trade
01/17/2013 : 02:39 PM	2/1/2013	\$99.00	3.665	\$1,450,000	Customer sold
01/17/2013 : 02:43 PM	2/1/2013	\$101.36	3.436	\$1,450,000	Customer bought

← \$30,909 Markup

City of Moberly, Missouri IDA CUSIP 607010AES

Our second example comes from trading in a City of Moberly Missouri industrial development bond listed in Table 5.¹⁶

After the \$3,025,000 par amount in this series was sold to investors in the offering, there was no further trading until October 21, 2010 when two positions totaling \$1,110,000 face value were sold to a dealer (or less likely to two different dealers). This

¹⁵ Trading in this bond can be found at emma.msrb.org/SecurityView/SecurityDetailsTrades.aspx?cusip=AA26831D723177D0DF520958201EDF2D9.

¹⁶ Trading in this bond can be found at emma.msrb.org/SecurityView/SecurityDetailsTrades.aspx?cusip=AF4F36FB38E73DB8C2962F0CA104AFD6E. On April 3, 2013 Missouri's Secretary of State submitted a Petition for an Order to Cease and Desist and to Show Cause against Morgan Keegan over taxable municipal bonds Morgan underwrote for the City of Moberly in July 2010.

dealer then sold the bonds to investors over the next four weeks for \$1,143,090 – a \$33,090 or \$2.48 average markup over the \$100.50 paid to the selling customers.

On October 22, 2010 a dealer charged a customer \$105.419 for a \$25,000 trade despite three other customer trades for \$25,000 the same day at \$102.669 and two trades for \$20,000 the day before at \$102.671. The \$105.41 price was clearly unfair and the markup charged excessive. It appears the same dealer a few days later made sales of \$20,000 and \$10,000 at \$105.414 despite a sale of \$10,000 at \$102.664 the same day. The \$105.414 charged twice on October 27, 2010 was unfair and the markup excessive.

Table 5: City of Moberly, Missouri

Trade Date/Time	Settlement Date	Price	Yield (%)	Trade Amt (\$)	Trade Submission Type
10/21/2010 : 02:16 PM	10/26/2010	100.5	5.255	\$610,000	Customer sold
10/21/2010 : 02:16 PM	10/26/2010	100.5	5.255	\$500,000	Customer sold
10/21/2010 : 02:51 PM	10/26/2010	102.671	4.75	\$20,000	Customer bought
10/21/2010 : 03:49 PM	10/26/2010	102.671	4.75	\$20,000	Customer bought
10/22/2010 : 10:50 AM	10/27/2010	102.669	4.75	\$25,000	Customer bought
10/22/2010 : 01:40 PM	10/27/2010	102.669	4.75	\$25,000	Customer bought
10/22/2010 : 01:43 PM	10/27/2010	102.669	4.75	\$25,000	Customer bought
10/22/2010 : 03:19 PM	10/27/2010	102.669		\$25,000	Inter-dealer Trade
10/22/2010 : 03:19 PM	10/27/2010	102.419		\$25,000	Inter-dealer Trade
10/22/2010 : 04:37 PM	10/27/2010	105.419	4.128	\$25,000	Customer bought
10/22/2010 : 04:37 PM	10/27/2010	103.669		\$25,000	Inter-dealer Trade
10/25/2010 : 08:19 AM	10/28/2010	102.668	4.75	\$10,000	Customer bought
10/26/2010 : 09:38 AM	10/29/2010	102.666	4.75	\$10,000	Customer bought
10/26/2010 : 02:35 PM	10/29/2010	102.535		\$180,000	Inter-dealer Trade
10/26/2010 : 02:35 PM	10/29/2010	102.476		\$180,000	Inter-dealer Trade
10/26/2010 : 02:55 PM	10/29/2010	102.666	4.75	\$10,000	Customer bought
10/26/2010 : 02:56 PM	10/29/2010	103.536	4.551	\$180,000	Customer bought
10/27/2010 : 10:14 AM	11/1/2010	102.664	4.75	\$5,000	Customer bought
10/27/2010 : 01:24 PM	11/1/2010	102.414		\$30,000	Inter-dealer Trade
10/27/2010 : 01:24 PM	11/1/2010	102.664		\$30,000	Inter-dealer Trade
10/27/2010 : 01:33 PM	11/1/2010	105.414	4.127	\$20,000	Customer bought
10/27/2010 : 01:33 PM	11/1/2010	103.664		\$30,000	Inter-dealer Trade
10/27/2010 : 01:33 PM	11/1/2010	105.414	4.127	\$10,000	Customer bought
10/27/2010 : 03:51 PM	11/1/2010	102.664	4.75	\$10,000	Customer bought
10/28/2010 : 01:37 PM	11/2/2010	102.412	4.808	\$100,000	Customer bought
11/01/2010 : 12:26 PM	11/4/2010	102.658	4.75	\$25,000	Customer bought
11/01/2010 : 04:36 PM	11/4/2010	104.199	4.398	\$5,000	Customer bought
11/01/2010 : 04:36 PM	11/4/2010	102.658		\$5,000	Inter-dealer Trade
11/02/2010 : 09:15 AM	11/5/2010	102.658		\$5,000	Inter-dealer Trade
11/02/2010 : 09:15 AM	11/5/2010	102.858	4.704	\$5,000	Customer bought
11/04/2010 : 11:49 AM	11/9/2010	102.651	4.75	\$5,000	Customer bought
11/04/2010 : 01:52 PM	11/9/2010	102.651	4.75	\$15,000	Customer bought
11/05/2010 : 11:59 AM	11/10/2010	103.302	4.6	\$260,000	Customer bought
11/05/2010 : 12:02 PM	11/10/2010	102.401		\$260,000	Inter-dealer Trade
11/19/2010 : 11:47 AM	11/24/2010	102.631	4.75	\$25,000	Customer bought
11/19/2010 : 03:36 PM	11/24/2010	100.472		\$150,000	Inter-dealer Trade
11/19/2010 : 03:37 PM	11/24/2010	101.99	4.9	\$150,000	Customer bought
11/19/2010 : 04:44 PM	11/24/2010	102.631	4.75	\$125,000	Customer bought

\$719 Markup

Bexar County, Texas Revenue Bond, CUSIP 088518JF3

Our third example comes from trading in a Bexar County, Texas revenue bond listed in Table 6.¹⁷ On January 8, 2013 a customer bought \$950,000 face value for

¹⁷ Trading in this bond can be found at emma.msrb.org/SecurityView/SecurityDetailsTrades.aspx?cusip=A4F707A59EFF635A0E825F2AFADFB28E1.

\$104.86. The average interdealer trade price that day was \$102.41 so this investor paid a \$2.45 markup. The average interdealer trade price over the prior five days was \$101.15 and so against this benchmark, the customer paid a \$3.71 markup. The median markup on trades this large is only 0.17%. The average price charged on ten much smaller customer purchases over the prior five days was \$103.28. The \$104.86 charged on the \$950,000 trade was clearly excessive.

Table 6: Bexar County, Texas

Trade Date/Time	Settlement Date	Price	Yield (%)	Trade Amt (\$)	Trade Submission Type
01/02/2013 : 11:51 AM	1/23/2013	\$104.208	3.479	\$40,000	Customer bought
01/02/2013 : 11:51 AM	1/23/2013	\$101.910	3.76	\$40,000	Inter-dealer Trade
01/02/2013 : 11:51 AM	1/23/2013	\$104.208	3.479	\$30,000	Customer bought
01/02/2013 : 11:51 AM	1/23/2013	\$101.910	3.76	\$30,000	Inter-dealer Trade
01/02/2013 : 12:48 PM	1/23/2013	\$101.298	3.836	\$2,000,000	Inter-dealer Trade
01/02/2013 : 12:52 PM	1/23/2013	\$101.358	3.828	\$2,000,000	Inter-dealer Trade
01/04/2013 : 11:53 AM	1/23/2013	\$102.395	3.7	\$100,000	Inter-dealer Trade
01/04/2013 : 11:53 AM	1/23/2013	\$102.395	3.7	\$100,000	Customer bought
01/04/2013 : 04:12 PM	1/23/2013	\$102.638	3.67	\$150,000	Inter-dealer Trade
01/04/2013 : 04:14 PM	1/23/2013	\$102.638	3.67	\$150,000	Customer bought
01/07/2013 : 10:00 AM	1/23/2013	\$102.270	3.715	\$50,000	Inter-dealer Trade
01/07/2013 : 10:00 AM	1/23/2013	\$102.395	3.7	\$50,000	Inter-dealer Trade
01/07/2013 : 10:00 AM	1/23/2013	\$104.270	3.471	\$50,000	Customer bought
01/07/2013 : 10:41 AM	1/23/2013	\$102.395	3.7	\$50,000	Inter-dealer Trade
01/07/2013 : 10:41 AM	1/23/2013	\$104.745	3.414	\$50,000	Customer bought
01/07/2013 : 12:12 PM	1/23/2013	\$102.335	3.707	\$100,000	Inter-dealer Trade
01/07/2013 : 12:14 PM	1/23/2013	\$102.395	3.7	\$100,000	Inter-dealer Trade
01/07/2013 : 12:22 PM	1/23/2013	\$102.720	3.66	\$100,000	Customer bought
01/07/2013 : 12:22 PM	1/23/2013	\$102.720	3.66	\$100,000	Inter-dealer Trade
01/07/2013 : 03:41 PM	1/23/2013	\$102.395	3.7	\$15,000	Inter-dealer Trade
01/07/2013 : 03:41 PM	1/23/2013	\$103.795	3.529	\$15,000	Customer bought
01/07/2013 : 03:46 PM	1/23/2013	\$102.395	3.7	\$15,000	Inter-dealer Trade
01/07/2013 : 03:46 PM	1/23/2013	\$103.795	3.529	\$15,000	Customer bought
01/07/2013 : 03:49 PM	1/23/2013	\$104.704	3.419	\$25,000	Customer bought
01/07/2013 : 03:49 PM	1/23/2013	\$102.395	3.7	\$25,000	Inter-dealer Trade
01/08/2013 : 12:31 PM	1/23/2013	\$102.395	3.7	\$2,115,000	Inter-dealer Trade
01/08/2013 : 12:35 PM	1/23/2013	\$102.420	3.696	\$2,115,000	Inter-dealer Trade
01/08/2013 : 01:04 PM	1/23/2013	\$102.910	3.637	\$220,000	Customer bought
01/08/2013 : 01:13 PM	1/23/2013	\$104.860	3.4	\$950,000	Customer bought
01/08/2013 : 01:26 PM	1/23/2013	\$102.910	3.637	\$700,000	Customer bought
01/08/2013 : 01:28 PM	1/23/2013	\$103.860	3.521	\$245,000	Customer bought

\$23,299 Markup

California State General Obligation Bond, CUSIP 13063BP7

Our fourth example comes from trading in a California State General Obligation listed in Table 7.¹⁸

¹⁸ Trading in this bond can be found at emma.msrb.org/SecurityView/SecurityDetailsTrades.aspx?cusip=A00F107479E462AE214AF012F4DD203D7.

On March 20, 2013 a customer bought \$1,880,000 for \$101.625. The average interdealer price that day was \$99.286 and the average price charged on much smaller quantities in the same bond the same day was \$99.98. The customer paid a \$2.37 markup - \$43,972 – relative to the interdealer price that day when the median markup on a trade of this size would have been less than \$2,000. This customer paid \$42,000 more than the median markup for this trade size and \$31,000 more than what she would have paid if she had just been charged the average markup charged on the smaller trades the same day in this bond.

Table 7 State of California

Trade Date/Time	Settlement Date	Price	Yield (%)	Trade Amt (\$)	Trade Submission Type
03/20/2013 : 10:14 AM	3/27/2013	\$99.375		\$100,000	Inter-dealer Trade
03/20/2013 : 10:14 AM	3/27/2013	\$99.475	4.03	\$100,000	Customer bought
03/20/2013 : 10:14 AM	3/27/2013	\$99.315		\$100,000	Inter-dealer Trade
03/20/2013 : 10:16 AM	3/27/2013	\$102.000	3.754	\$10,000	Customer bought
03/20/2013 : 10:53 AM	3/27/2013	\$99.200		\$1,000,000	Inter-dealer Trade
03/20/2013 : 10:55 AM	3/27/2013	\$99.125		\$1,000,000	Inter-dealer Trade
03/20/2013 : 11:02 AM	3/27/2013	\$99.477		\$35,000	Inter-dealer Trade
03/20/2013 : 11:02 AM	3/27/2013	\$99.227		\$35,000	Inter-dealer Trade
03/20/2013 : 11:06 AM	3/27/2013	\$99.577	4.024	\$10,000	Customer bought
03/20/2013 : 11:06 AM	3/27/2013	\$99.477		\$10,000	Inter-dealer Trade
03/20/2013 : 11:25 AM	3/27/2013	\$99.315		\$1,750,000	Inter-dealer Trade
03/20/2013 : 11:26 AM	3/27/2013	\$99.375		\$1,750,000	Inter-dealer Trade
03/20/2013 : 11:57 AM	3/27/2013	\$99.477		\$55,000	Inter-dealer Trade
03/20/2013 : 11:57 AM	3/27/2013	\$99.352		\$55,000	Inter-dealer Trade
03/20/2013 : 11:57 AM	3/27/2013	\$99.577	4.024	\$55,000	Customer bought
03/20/2013 : 12:37 PM	3/27/2013	\$101.625	3.8	\$1,880,000	Customer bought
03/20/2013 : 02:01 PM	3/28/2013	\$101.250	3.846	\$15,000	Customer bought
03/20/2013 : 02:03 PM	3/27/2013	\$101.250	3.846	\$20,000	Customer bought
03/20/2013 : 02:37 PM	3/27/2013	\$101.418	3.825	\$20,000	Customer bought
03/20/2013 : 02:37 PM	3/27/2013	\$99.700		\$20,000	Inter-dealer Trade
03/20/2013 : 02:49 PM	3/27/2013	\$99.650	4.02	\$50,000	Customer bought
03/20/2013 : 02:59 PM	3/27/2013	\$102.000	3.754	\$15,000	Customer bought
03/20/2013 : 04:09 PM	3/27/2013	\$99.700	4.017	\$35,000	Customer bought

\$43,937 Markup

VI. Excessive Markups in the Aggregate

The four examples reflect our proposed markers of excessive markups. Each example involved a markup which was a multiple of the median markup for similar-sized trades. In several of the examples the investor was charged a higher markup than the weighted average markup charged on smaller purchases of exactly the same bond on the same day or during the previous five trading days. We estimate the amount of excessive

markups in the aggregate in our sample by first selecting trades on which excessive markups appear to have been charged based on these two proposed markers.

We identify trades as having been charged an excessive markup if either Condition 1 or Condition 2 holds.

Condition 1: Markup (markdown) charged is more than twice the median markup (markdown) for similar size trade in the same calendar year.

Condition 2: Markup (markdown) charged is greater than the weighted average markup (markdown) charged on smaller sized trades in the same bond during the prior five trading days by 0.50% or more.

The first condition judges a markup based on how large it is relative to the same size purchase or sale in the same year. We identify the markup as excessive if it is twice the percentage markup on similar-size trades in similar bonds in the same calendar year.

The second condition more narrowly focuses on trades in exactly the same bond in the prior week. This criterion is motivated by FINRA's assessment of the fairness of prices charged by dealers in light of prices charged other investors at the same time for the same bond. We identify the markup as excessive if the dealer has charged a markup that is at least 0.5% greater than charged on average on smaller trades in the prior week. For example, our procedure would flag a 2.0% markup on a \$1,000,000 if ten customer purchases of between \$25,000 and \$100,000 in exactly the same bond had been executed over the prior five days at a weighted average markup of 1.50% or less.

Both conditions take into account current market conditions and attributes of the trade being evaluated. Both conditions can be relaxed or made more stringent by varying the threshold to be greater than or less than twice the median markup or greater or less than 0.5% of the average markup on smaller trades in the same bond.

Table 8 reports the results of applying these two conditions to trading in long term municipal bonds. The markup charged on nine and a half percent of the trades in our sample is at least twice the median markup for similar-size trades. Dealers charged \$5.24

billion in markups on these trades, \$4.30 billion of which was in excess of the markups which would have resulted from applying the median markup for similar-size trades.

Table 8 Excessive Markups in the Aggregate

Condition	Percent of Trades	Aggregate Markups	Markups in excess of Median
1	9.5%	\$5.24 billion	\$4.30 billion
2	16.0%	\$3.24 billion	\$2.10 billion
1 and 2	4.4%	\$2.10 billion	\$1.76 billion
1 or 2	21.1%	\$6.38 billion	\$4.64 billion

The markups charged by dealers on just 9.5 percent of the trades equal as much of the \$10.58 billion total in our sample as the markups dealers charged on the remaining 90.5 percent of the trades. In other words, the average markup on the nine and a half percent of trades flagged by our first condition are ten times as great as the average markup charged on the remaining ninety percent of the trades.

The markups charged on sixteen percent of the trades in our sample satisfy the second condition. Dealers charged \$3.24 billion in markups on these trades, \$2.10 billion of which was in excess of the markups which would have resulted from applying the median markup for similar-size trades.

Four percent of the trades in our sample satisfy both conditions. \$2.10 billion in markups were charged on these trades, \$1.76 billion of which was in excess of the markups which would have resulted from applying the median markup for similar-size trades.

Twenty-one percent of the trades in our sample satisfy one or the other or both conditions. \$6.38 billion in markups were charged on these trades, \$4.64 billion of which was in excess of the markups which would have resulted from applying the median markup for similar-size trades.

VII. Conclusion

Based on our analysis of a portion of the MSRB's EMMA data, we estimate that investors have been charged at least \$20 billion in markups and markdowns since 2005.

We've provided four examples of how the EMMA data can be used to determine whether the price charged for a municipal bond was fair and the markup not excessive. We have determined that between \$1.76 billion and \$6.38 billion of excessive markups and markdowns have been charged since 2005 on our subset of publicly available municipal bond trades. Given our large but not exhaustive data set, the aggregate amount of excessive markups since 2005 likely substantially exceeds \$10 billion. This same publicly available data – supplemented by non-public information available to dealers and regulators – could improve surveillance of pricing in the municipal bond market.

Sunshine would eliminate much of the municipal bond markup abuses we have identified. Dealers are already required to determine that the prices and markups charged are fair. This can only be done by reference to prevailing market values, typically grounded in the dealer's contemporaneous cost. Prevailing market values and markups are already estimated by dealers every time they execute a trade. If dealers disclosed to investors what markup was being charged, the markups charged on municipal bonds would quickly drop to markups found on other securities. This sunshine would benefit both taxpayers and investors.

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