Internet Appendix to

The Price of Safety: The Evolution of Municipal Bond Insurance Value

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October 25, 2022

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A.1 Non-parametric estimate of insurance value

The IPWRA method employed in Section 5.3 of the paper is doubly robust and unbiased given the well-specified outcome model. However, because the IPWRA method relies upon a parametric model to generate weights, we also use the non-parametric CEM method proposed by Iacus et al. (2011) and Iacus et al. (2012). CEM begins by generating a multi-dimensional grid of covariates to match upon, dividing each variable into bins (potentially of varying widths). As an illustrative example, employing only two covariates (maturity and issue size) and stratifying by deciles to create bins, we obtain a square divided into 100 smaller squares ("strata"), with the shortest maturity and smallest issue size bonds in the lower left strata and the longest maturity and largest issue size bonds in the upper right strata. Within each strata, we then compare insured and uninsured bonds, discarding all strata where there are either no insured bonds or uninsured bonds to ensure that all measures calculated have common support. The benefit of CEM is reducing imbalance and avoiding dependence on model specification. Because bond maturity and issue size are highly skewed, the non-parametric CEM helps to match well across all of the percentiles of the underlying distribution.

Implementation of CEM requires a choice of bin size. Very wide bins result in inefficient matching, whereas very narrow bins or including too many covariates result in discarding most of the sample since we require both insured and uninsured bonds within each strata. We restrict bonds to match on year and credit rating, ensuring that each strata includes only bonds which are "locally close" with respect to issue size and duration and exactly matched on credit rating and year. Matching exactly by state presents a "too many covariate" problem with respect to the consistency of estimation, so we match instead on terciles of tax privilege as calculated in Babina et al. (2021).

Table A.5 report the results of our CEM estimation. Panel A shows the ATE based on the simple average of the difference in yields between insured and uninsured bonds across strata. Panel B shows the ATE based on the weighted mean effect which we calculate by regressing yields on the insurance dummy, bond characteristics, and macroeconomic variables to control for any intra-strata variation using the CEM weights (which are calculated for each observation based on the matches in its strata).

Panel A indicates significant gross insurance value only in the 2000–2008 period with a highly competitive Aaa insurance market. The gross value is insignificant in the earlier 1985–1999 period with Aaa insurance sold by a few large companies. We observe yield inversion (negative gross value to insurance) in the post-crisis 2009–2020 period when insurance no longer provides Aaa coverage. Results in Panel B support the same overall conclusion about the value of Aaa insurance (versus lower quality insurance) although (1) the gross value in the early 1985–1999 period is significantly positive, (2) the magnitude of yield inversion in 2009–2020 is much smaller than in Panel A, and (3) the gross value of insurance is positive for the full 36-year period (masking the time series variation). Taken together, the non-parametric estimates of insurance value in Table A.5 reveal a large erosion of insurance value following the demise of the monolines compared to the selection-adjusted value estimates in Table 5.3.

A.2 Transaction cost function estimation for full-panel analysis

The muni bond regression model is:

$$\begin{aligned} r_{ts} &= c_0(Q_t - Q_s) + c_1(Q_t\frac{1}{S_t} - Q_s\frac{1}{S_s}) + c_2(Q_t \log S_t - Q_s \log S_s) \\ &\quad + \beta_1 MKT_{ts} + \beta_2 TERM_{ts} + \gamma ND_{ts}(5\% - CP) + \eta_{ts}. \end{aligned} \tag{A.1}$$

In this regression, r_{ts} is the change in logged price of the bond from trade at time s to trade at time t.[1] The price of the bond is converted to the equivalent price had the bond had a 5% coupon rate. ND_{ts} is the number of days, expressed in fraction of years, between trade s and trade t. CP is the coupon rate of the bond. Q is the trade direction. It is equal to 1 for a buy customer trade, -1 for a sell customer trade, and 0 for an interdealer trade.[2] S is the size of the trade, expressed in \$1,000. MKT_{ts} is the overall municipal bond market return between trades s and t. This is computed as the logged change in BAML U.S. Municipal Bond Market Total Return Index between times s and t. $TERM_{ts}$ is the difference in return between long-term and short-term municipal bonds between times s and t. The short-term municipal bond return is computed as the logged change in the BAML U.S. Municipal Bonds 1-3 Years Total Return Index. The long-term municipal bond return is computed similarly from BAML U.S. Municipal Bonds 12-22 Years Total Return Index. η_{ts} is the regression error term. With five parameters to estimate, the minimum requirement is that a bond has at least six trades. Even among these bonds with at least six trades, the model estimation is not always possible (for example, if all the trades in a bond are buyer-initiated). Thus, to obtain reliable estimates of transaction cost function, we require bonds to have at least 30 trades. These constraints reduce substantially the number of bonds for which transaction costs can be reliably estimated.

The return model is estimated by iterated weighted least squares, with the weight being the inverse of the variance of the error term given by:

$$\sigma^2_{ts} = NS_{ts}\sigma^2_{Sessions} + D_{ts}\sigma^2_\delta + (2 - D_{ts})\sigma^2_\kappa, \tag{A.2}$$

where NS_{ts} is the number of trading sessions (and fractions of trading sessions) between trades s and t, $\sigma^2_{Sessions}$ is the variance of the bond-specific valuation factor per trading session, D_{ts} is the number of interdealer trades in the trade pair s and t ($D_{ts} = 0, 1, 2$), σ^2_δ is the variance of the price concession in interdealer trades, and σ^2_κ is the variance of customer transaction cost not explained by the average transaction cost function. The variance of the error term is estimated from a pooled regression across all bonds for each market, and thus all bonds in each market have the same $\sigma^2_{Sessions}$, σ^2_δ, and σ^2_κ

The estimation proceeds as follows. Starting with an initial guess for $\sigma^2_{Sessions}$, σ^2_δ, and σ^2_κ, we obtain an estimate for σ^2_{ts}. The inverse of σ^2_{ts} is then used as the weight for the regression

[1] If multiple trades occur in the same bond at the same time and with the same trade type, we aggregate them as one single trade with the price being the size-weighted average price.

[2] We note that MSRB records trade indicator type from dealers' perspective. That is, a "P" ("S") indicates a purchase (sale) by the dealer, which corresponds to a customer sell (buy) trade.

in equation (A.1) for each bond. From this step, we obtain the regression error term η_{ts}. In the next step, we pool all bonds and regress η_{ts}^2 on NS_{ts}, D_{ts}, and $(2 - D_{ts})$ to obtain estimates of $\sigma_{Sessions}^2$, σ_{δ}^2, and σ_{κ}^2. This is a constrained regression as the estimated variances have to be non-negative. The process continues until convergence (we use the improvement in the log likelihood score of the model to determine convergence status).

After the model estimation, the transaction cost as a function of trade size S for each bond in the sample is

$$\hat{c}(S) = c_0 + c_1 \frac{1}{S} + c_2 \log S.$$

The transaction cost estimated here is interpreted as the half-spread. It reflects the increase in price if a customer wants to buy, or the decrease in price if a customer wants to sell. A higher transaction cost indicates a low level of liquidity, and vice versa.

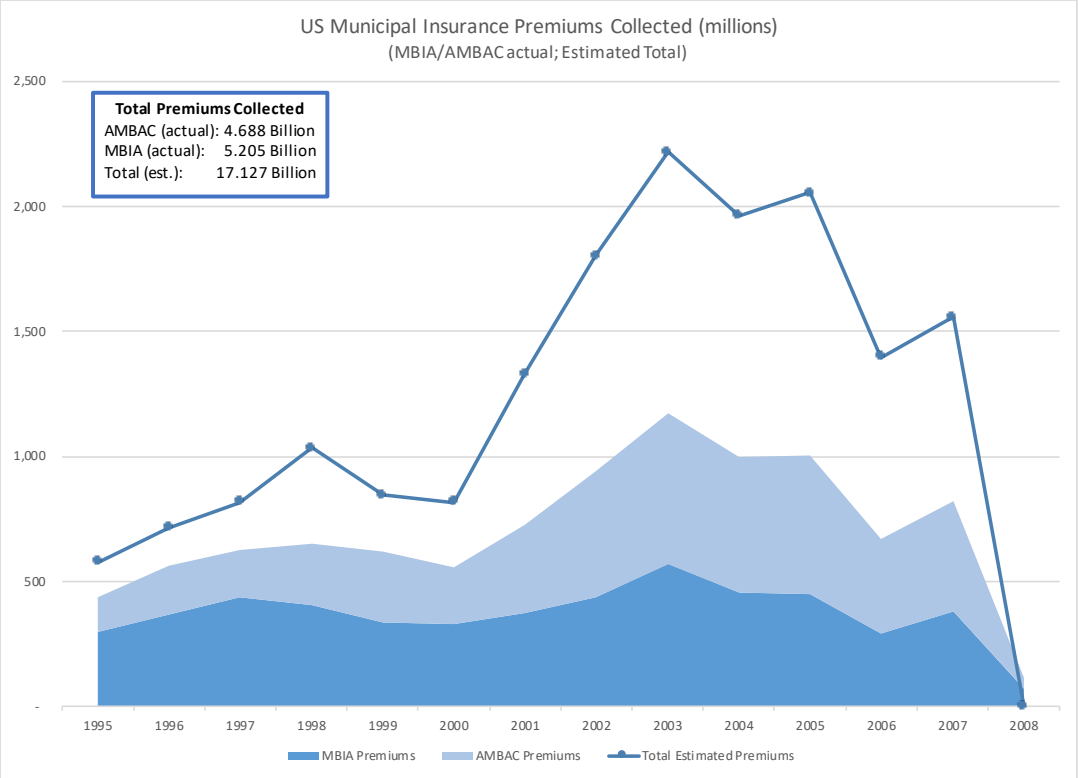
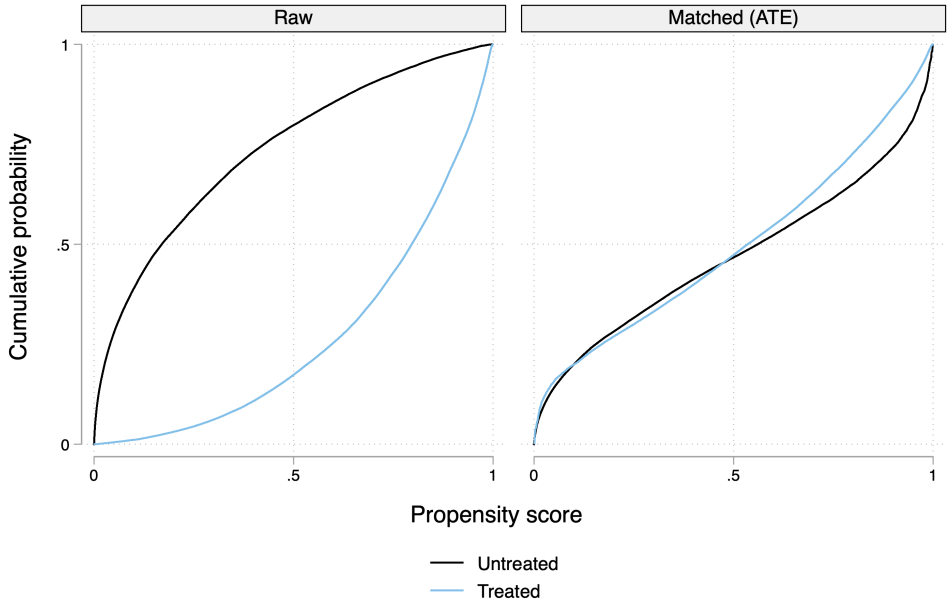
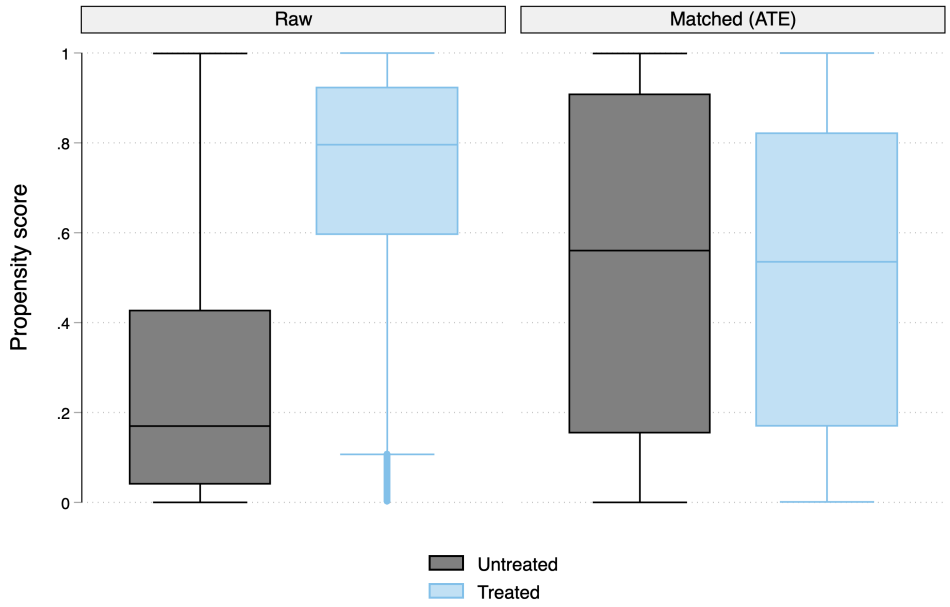


Figure A.1: Premiums Collected by MBIA, AMBAC, and Estimated Total Market

We calculate premiums with data from 10-K filings by public insurers MBIA and AMBAC. Between 1994 and 2008, these two insurers collected $10.2 billion dollars in gross premiums written on global public finance in the US. We then estimate premiums for other insurers based on the average premium charged by MBIA and AMBAC and the relative market share of each insurer. In 2020, Assured Guaranty collected $294 million dollars in gross premiums.



(a) Cumulative Empirical Distributions of Propensity Scores



(b) Box-Plot of Matched and Unmatched Propensity Score Distributions

Figure A.2: Improvements in Matching from Applying IPW Weights

This figure plots the changes in the propensity score distribution from the weighting procedure in the IPWRA estimation in Section 5. The top panel plots the cumulative empirical kernel-smoothed distribution for the matched and unmatched sample, and the lower panel plots medians and percentiles of the same distribution.

Table A.1: Subsample analysis of offering yields by rating and insurance status for GO bonds

The table compares offering yields of insured and uninsured bonds by underlying credit rating class for GO bonds over three subsample periods covering 1985–2020. The "Rating" column shows the underlying rating at the time of bond issuance. The "Diff." column shows the difference in each variable as insured minus uninsured. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

A. 1985–1999

	Insured Bonds		Uninsured Bonds			
Rating	Nobs	Mean	Nobs	Mean	Diff.	t-stat
Aaa	1	4.95	7115	4.95	0.00	0.21
Aa	3256	4.86	32049	5.03	-0.18^{***}	-13.79
A	45289	5.03	29104	5.31	-0.28^{***}	-38.26
Baa	17097	5.19	12010	5.59	-0.40^{***}	-32.90
Ba and below	207	5.06	376	5.53	-0.48^{***}	-6.55
Nonrated	38266	5.05	48754	5.26	-0.21^{***}	-30.67

B. 2000–2008

	Insured Bonds		Uninsured Bonds			
Rating	Nobs	Mean	Nobs	Mean	Diff.	t-stat
Aaa	463	3.87	13345	3.82	0.06	1.64
Aa	40967	3.87	38183	3.91	-0.04^{***}	-6.55
A	90439	3.88	22847	3.99	-0.11^{***}	-16.36
Baa	19134	4.00	6217	4.10	-0.10^{***}	-7.26
Ba and below	87	4.59	47	4.34	0.25	1.28
Nonrated	42319	4.04	71806	4.13	-0.09^{***}	-16.02

C. 2009–2020

	Insured Bonds		Uninsured Bonds			
Rating	Nobs	Mean	Nobs	Mean	Diff.	t-stat
Aaa	0	N.A.	20181	2.14	N.A.	N.A.
Aa	2524	2.83	83905	2.30	0.53^{***}	24.21
A	34753	2.67	19860	2.42	0.25^{***}	27.27
Baa	12572	2.89	1528	3.23	-0.34^{***}	-10.17
Ba and below	5	3.43	75	3.31	0.12	0.52
Nonrated	4652	2.34	123454	2.34	-0.0004	-0.03

Table A.2: Subsample analysis of offering yields by rating and insurance status for Revenue bonds

The table compares offering yields of insured and uninsured bonds by underlying credit rating class for Revenue bonds over three subsample periods covering 1985–2020. The "Rating" column shows the underlying rating at the time of bond issuance. The "Diff." column shows the difference in each variable as insured minus uninsured. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

A. 1985–1999

	Insured Bonds		Uninsured Bonds			
Rating	Nobs	Mean	Nobs	Mean	Diff.	t-stat
Aaa	33	4.70	1620	4.96	-0.27^{*}	-1.87
Aa	1793	4.91	9369	5.27	-0.36^{***}	-19.28
A	16931	5.10	12301	5.59	-0.49^{***}	-38.93
Baa	5211	5.28	4432	5.55	-0.27^{***}	-13.41
Ba and below	3	5.52	16	5.52	-0.00	-0.00
Nonrated	22895	5.18	31463	5.63	-0.45^{***}	-47.70

B. 2000–2008

	Insured Bonds		Uninsured Bonds			
Rating	Nobs	Mean	Nobs	Mean	Diff.	t-stat
Aaa	35	4.26	3883	3.91	0.35^{***}	5.35
Aa	14643	4.00	12257	4.06	-0.06^{***}	-5.70
A	34846	4.01	5080	4.17	-0.16^{***}	-11.54
Baa	3904	4.18	1132	4.47	-0.29^{***}	-7.66
Ba and below	5	4.63	6	7.34	-2.70^{***}	-7.00
Nonrated	14483	4.04	23018	4.47	-0.43^{***}	-40.90

C. 2009–2020

	Insured Bonds		Uninsured Bonds			
Rating	Nobs	Mean	Nobs	Mean	Diff.	t-stat
Aaa	0	N.A.	2999	2.40	N.A.	N.A.
Aa	1082	2.91	31072	2.57	0.34^{***}	10.11
A	8786	2.87	10743	2.90	-0.03^{**}	-2.09
Baa	946	3.11	658	3.68	-0.56^{***}	-9.13
Ba and below	4	2.93	16	6.07	-3.14^{***}	-8.59
Nonrated	1087	2.51	33114	2.69	-0.19^{***}	-5.71

Table A.3: Marginal Effects of the Choice to Insure: GO + REV Bonds

This table reports the marginal effects from the probit selection model specified in Equation (5) of the paper. Each coefficient represents the percentage increase in the probability of insurance from a unit change in the corresponding variable. The table also reports the percentage of insured and uninsured bonds correctly classified by the model. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

		Subsample Analysis		
Variable	1985–2020	1985–1999	2000–2008	2009–2020
Ratings				
Ba2 rated	-0.198*	-0.163	0.000	0.000
Ba1 rated	0.057**	0.020	0.016	0.101**
Baa2 rated	0.028*	0.047*	0.001	0.126***
Baa1 rated	0.036***	0.077***	0.003	0.080***
A3 rated	-0.013	0.045*	-0.023*	0.025
A2 rated	0.039***	0.085***	0.021*	0.045***
(A1 rating base)	0.000	0.000	0.000	0.000
Aa3 rated	-0.274***	-0.337***	-0.143***	-0.367***
Aa2 rated	-0.416***	-0.448***	-0.302***	-0.456***
Aa1 rated	-0.517***	-0.510***	-0.512***	-0.480***
Credit Enhancement	-0.162***	-0.233***	-0.052***	-0.211***
Duration	0.011***	0.013***	0.016***	-0.000
Duration^2	-0.000***	-0.000**	-0.001***	0.000
LN(Issue Amount)	0.001	0.034***	-0.005	-0.027***
Num. of Agents	-0.008***	-0.011***	-0.007***	-0.006***
Neg. Offering (Y/N)	-0.036***	0.007	-0.015	0.006
Call Dummy (Y/N)	0.006*	-0.017**	0.005	0.009***
GO Dummy (Y/N)	0.029**	0.034	-0.017	0.027
Use of Proceeds				
General Purposes	-0.007	0.009	0.004	-0.019*
Higher Education	-0.001	0.025	0.003	0.011
K-12 Education	0.003	0.050	-0.022	0.061***
Water and Sewer	0.128***	0.052**	0.118***	0.057***
Previous Insurance				
Top Tercile Habit	0.141***	0.163***	0.180***	0.045***
Underwriter Intensity Dummies	Yes	Yes	Yes	Yes
State and Year Effects	Yes	Yes	Yes	Yes
Observations	619,851	163,474	253,801	198,542
Pseudo R2	39.26	33.67	26.63	64.36
% Insured Correct	82.20	77.98	89.97	86.27
% UnInsured Correct	78.94	78.20	52.79	93.96

Table A.4: Inverse Probability Weighted Regressions: GO + REV Bonds

This table reports estimates of insurance value (in percentage points) from empirical model specified in Equation (6) of the paper. Negative values of the average treatment effect (ATE) indicate that insured bonds have lower yields than comparable (control) uninsured bonds. Standard errors of the ATE estimates are in parentheses. Panel A shows results for the dependent variable being the offering yield reported in Mergent. Panel B shows results for the dependent variable being the primary market yield. This market yield is calculated by averaging the yields on customer buys in the primary market, weighted by trade size. Trade data are from MSRB and only available from 2005 onward. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Panel A: Inverse-Probability Weighted Regression Model: Offering Yields

ATE	1985–2020	1985–1999	2000–2008	2009–2020
Uninsured	6.642	9.057	6.872	4.453
Insured	6.619	8.978	6.710	4.495
Avg. Treatment Effect	-0.023*	-0.079***	-0.162***	0.041
	(0.010)	(0.017)	(0.012)	(0.047)
Observations	620,059	163,682	253,819	202,558

Panel B: Inverse-Probability Weighted Regression Model: Market Yields

	2005–2020	1985–1999	2005–2008	2009–2020
Uninsured	5.059	6.462	6.462	4.395
Insured	5.089	6.307	6.307	4.411
Avg. Treatment Effect	0.030	-0.155***	-0.155***	0.016
	(0.016)	(0.014)	(0.014)	(0.049)
Observations	288,170	95,662	95,662	192,508

Table A.5: Average Value of Insurance GO Bonds: Non-Parametric Selection Models

This table reports estimates of insurance value (in percentage points) using Coarsened Exact Matching methodology to control for the selection into insurance non-parametrically. Negative values of the average treatment effect (ATE) indicate that insured bonds have lower yields than comparable (control) uninsured bonds. t-statistics of the ATE estimates are in parentheses. We balance the sample by placing insured and uninsured bonds in strata which match exactly on year, credit rating and terciles of tax privilege (as in Babina et al., 2021), and are locally close with respect to duration and issue size. Only strata with both insured and uninsured bonds are included, ensuring common support in the sample. Panel A shows the Average Treatment Effect (ATE) as the simple weighted average of the difference in yields between matched insured and uninsured bonds across strata. Panel B shows the ATE estimated from a weighted regression controlling for macroeconomic variables, residual credit rating and year effects, and other determinants from Equation (6) of the paper. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Panel A: Coarsened Exact Matching (Simple Average ATE)

	1985–2019	1985–1999	2000–2008	2009–2020
Uninsured	6.839	8.894	6.691	4.406
Insured	6.838	8.880	6.612	4.676
Avg. Treatment Effect	-0.001	-0.014	-0.080***	0.270***
	(-0.12)	(-1.25)	(-6.15)	(11.46)
Observations	373,747	108,501	191,344	74,117

Panel B: Coarsened Exact Matching (Regression-Based ATE)

	1985–2019	1985–1999	2000–2008	2009–2020
Uninsured	6.859	8.911	6.708	4.444
Insured	6.811	8.857	6.599	4.577
Avg. Treatment Effect	-0.049***	-0.054***	-0.108***	0.133***
	(-11.08)	(-6.34)	(-19.57)	(12.74)
Observations	373,504	108,279	191,323	74,117

Table A.6: Inverse Probability Weighted Regressions: Additional Robustness Panels

All panels report estimates of insurance value (in percentage points) from the base empirical model specified in Section 5.1 of the paper but augmented in various ways. Standard errors of the ATE estimates are in parentheses. In Panel A, estimation weights are adjusted to achieve covariate entropy balance as in Hainmueller (2012) for all rating and proceeds dummies, issue size, duration, number of agents, and call, bank qualified, negotiated deal, additional credit enhancement, and prior insurance use dummies. Panel B extends the estimation to the additional 693 non-investment grade GO issued bonds in our sample period. Panel C includes all macro controls in both the outcome and selection equations. Panel D includes issuer fixed effects in the outcome equation (in addition to year fixed effects and both year and state fixed effects in the selection equation). Panel E includes county and year fixed effects in both the outcome and selection equations. Panel F includes county economic controls (in addition to year and state fixed effects) in both the outcome and selection equations. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Panel A: Offering Yields with Entropy Balancing Weights

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	6.540	8.992	6.817	4.398
Insured	6.555	8.954	6.681	4.339
Avg. Treatment Effect	0.015	-0.038**	-0.137***	-0.059
	(0.012)	(0.019)	(0.013)	(0.041)
Observations	456,637	117,338	187,482	151,817

Panel B: Offering Yields Including Junk Bonds

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	6.549	8.994	6.820	4.407
Insured	6.561	8.944	6.681	4.401
Avg. Treatment Effect	0.012	-0.050***	-0.138***	-0.006
	(0.012)	(0.018)	(0.013)	(0.061)
Observations	457,330	117,865	187,569	151,896

Panel C: Offering Yields with Macro Variables in the Selection Equation

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	6.545	8.992	6.819	4.395
Insured	6.559	8.944	6.681	4.397
Avg. Treatment Effect	0.013	-0.048***	-0.137***	0.001
	(0.012)	(0.018)	(0.013)	(0.059)
Observations	456,637	117,338	187,482	151,817

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Table A.6: Inverse Probability Weighted Regressions: Additional Robustness Panels (Continued)

Panel D: Offering Yields with Issuer Fixed Effects in Outcome Equation

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	6.755	8.955	6.774	3.900
Insured	6.729	8.967	6.706	3.874
Avg. Treatment Effect	-0.026***	0.012	-0.068***	-0.026
	(0.011)	(0.021)	(0.014)	(0.049)
Observations	455,684	116,904	187,446	145,956

Panel E: Offering Yields with County Fixed Effects in Both Equations

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	6.497	8.888	6.753	4.493
Insured	6.519	8.863	6.622	4.655
Avg. Treatment Effect	0.022	-0.025*	-0.131***	0.163***
	(0.011)	(0.015)	(0.013)	(0.042)
Observations	454,610	117,221	187,256	150,133

Panel F: Offering Yields with County Economic Controls in Both Equations

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	6.392	8.732	6.754	4.338
Insured	6.404	8.716	6.616	4.366
Avg. Treatment Effect	0.012	-0.016	-0.138***	0.029
	(0.013)	(0.021)	(0.013)	(0.059)
Observations	443,759	107,209	186,675	149,875

Table A.7: Insurance and Secondary Market Liquidity by Rating

The table compares the average liquidity of insured and uninsured bonds, along with tests for significant differences between them. Observations are at the CUSIP-month level. *Bid-ask spread* is the difference between the weighted average customer buy price and customer sell price (weighted by trade size), expressed in bps of the average price. *Interquartile range* is the interquartile range of customer transaction prices on a given day, expressed in bps of the average price. Both *Bid-ask spread* and *Interquartile range* are computed for each day, then averaged across the month. *Amihud* measure is the absolute price change (in bps) per each $1,000 of trading volume, averaged over each month. *Price impact* is the coefficient from the regression of price changes (in bps) on signed square root of trade size (positive for customer buys and negative for customer sells), estimated separately for each month. *% days without trade* is the percent of trading days in a month without a trade. Secondary market data are from the MSRB and cover the 2005–2020 period. The "Diff." column shows the two-sided t-test statistic on equality of liquidity of insured and uninsured bonds. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

	GO Bonds					Revenue Bonds				
	Insured		Uninsured		Diff.	Insured		Uninsured		Diff.
	Nobs	Mean	Nobs	Mean	t-stat	Nobs	Mean	Nobs	Mean	t-stat
Panel A: Aaa-rated Bonds										
Bid-ask spread (bps)	1534	56.57	94431	38.55	11.63***	595	80.07	34553	38.79	17.32***
Interquartile Range (bps)	827	70.74	69749	55.85	5.59***	498	96.27	22162	60.66	9.24***
Amihud measure (bps)	3964	9.19	252970	6.01	10.98***	1313	8.83	83489	6.32	7.05***
Price impact (bps)	1906	18.19	131604	13.18	8.07***	879	19.28	43874	12.80	7.57***
% days without trade	4012	88.61	256670	89.13	−3.79***	1320	82.21	84390	88.65	−14.79***
Panel B: Aa-rated bonds										
Bid-ask spread (bps)	124422	53.40	295638	42.14	65.38***	86675	62.42	212119	43.92	81.95***
Interquartile Range (bps)	67114	68.90	257819	62.58	20.75***	53538	83.14	182715	66.71	41.27***
Amihud measure (bps)	348019	8.50	821979	6.04	82.00***	212326	9.18	532148	6.28	74.46***
Price impact (bps)	149845	16.90	447212	13.84	39.50***	110045	18.49	314707	14.00	49.11***
% days without trade	353858	89.25	835436	88.82	24.39***	214702	86.88	537744	87.57	−23.70***
Panel C: A-rated bonds										
Bid-ask spread (bps)	177211	60.19	80938	61.46	−5.55***	174076	71.99	88184	61.45	42.95***
Interquartile Range (bps)	115675	72.75	63891	79.26	−18.14***	119300	90.10	86520	81.15	24.98***
Amihud measure (bps)	583883	9.67	217346	7.96	42.87***	453254	10.76	211514	7.75	66.86***
Price impact (bps)	234034	19.97	113912	17.23	27.30***	231564	21.83	136353	16.94	50.88***
% days without trade	598899	90.25	221678	87.42	105.13***	459821	86.94	213642	85.14	49.99***

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Table A.7: Insurance and Secondary Market Liquidity by Rating (Continued)

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	GO Bonds					Revenue Bonds				
	Insured		Uninsured		Diff.	Insured		Uninsured		Diff.
	Nobs	Mean	Nobs	Mean	t-stat	Nobs	Mean	Nobs	Mean	t-stat
Panel D: Baa-rated Bonds										
Bid-ask spread (bps)	33011	66.38	16317	71.59	-8.91^{***}	25183	80.14	11114	74.95	6.27^{***}
Interquartile Range (bps)	25345	82.33	11867	101.44	-19.96^{***}	18306	104.70	8799	109.47	-3.50^{***}
Amihud measure (bps)	104775	10.14	37003	10.13	0.08	59201	12.28	23439	11.96	1.24
Price impact (bps)	45465	20.73	19914	18.38	9.30^{***}	33354	23.15	14450	19.25	10.14^{***}
% days without trade	107976	89.58	37864	84.22	63.25^{***}	59953	84.71	23729	82.41	17.25^{***}
Panel E: High-yield bonds										
Bid-ask spread (bps)	993	51.63	263	56.73	-1.17	85	117.24	75	56.34	4.55^{***}
Interquartile Range (bps)	720	77.85	174	101.46	-3.29^{***}	48	137.38	53	88.99	1.99^{**}
Amihud measure (bps)	2235	6.79	502	7.06	-0.53	176	35.12	160	6.86	6.50^{***}
Price impact (bps)	1369	15.82	275	14.93	0.53	100	59.26	77	11.19	5.41^{***}
% days without trade	2255	85.57	516	81.97	3.42^{***}	177	88.30	163	91.69	-4.94^{***}
Panel F: Non-rated bonds										
Bid-ask spread (bps)	41290	59.73	99619	50.05	31.22^{***}	40865	75.30	92192	58.02	43.98^{***}
Interquartile Range (bps)	18756	69.44	94404	63.52	9.74^{***}	21942	96.93	77653	74.77	28.33^{***}
Amihud measure (bps)	131268	11.22	324547	7.67	47.16^{***}	113013	14.59	239080	10.60	36.18^{***}
Price impact (bps)	41577	21.06	151439	16.79	23.60^{***}	48508	25.95	129517	17.61	43.07^{***}
% days without trade	136055	91.04	336908	90.73	15.09^{***}	115429	88.41	243914	88.39	0.78

Table A.8: Inverse Probability Weighted Regressions on Transaction Costs

These tables presents estimates of the liquidity value of insurance, using the full IPWRA methodology detailed in Equations (5) and (6) in Section 5.1 of the paper, but replacing the dependent variable in those equations with the estimated half-spread transaction cost estimated as in Harris and Piwowar (2006) and detailed above. Transaction cost functions are estimated using MSRB trade data from 2005-2019 for bonds issued after 2005 and having at least 30 trades. Errors are clustered at the issuer-level and t-statistics are presented in parentheses below the estimates.

IPWRA: Transaction Costs for $20,000 trade size

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	84.975		89.752	84.609
Insured	86.413		88.941	86.222
Avg. Treatment Effect	1.438		-0.811	1.612
	(1.289)		(-0.420)	(0.616)
Observations	17,249		8,042	9,207

IPWRA: Transaction Costs for $50,000 trade size

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	79.295		83.837	80.219
Insured	80.873		82.550	80.894
Avg. Treatment Effect	1.578		-1.286	0.674
	(1.457)		(-0.688)	(0.266)
Observations	17,249		8,042	9,207

IPWRA: Transaction Costs for $100,000 trade size

ATE	Full Sample	Oligopoly Aaa	Competitive Aaa	No Aaa
Uninsured	73.438		77.535	75.388
Insured	75.262		76.216	77.645
Avg. Treatment Effect	1.824		-1.319	2.257
	(1.337)		(-0.719)	(0.710)
Observations	17,249		8,042	9,207

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