Flight to Liquidity or Safety? Recent Evidence from the Municipal Bond Market

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COVID-19 increased muni credit and liquidity risks

- Liquidity risks:
  - Financial market panic and flight-to-liquidity took hold in March 2020.
  - Even relatively safe markets, like the municipal bond market, underwent severe dislocations.
- Credit risks:
  - Tax deadlines were extended and revenue projections declined.
  - Threatening the ability of issuers to service existing debt.
- Municipal security yields increased sharply due to these pressures.

Fiscal and Monetary Authorities Took Action

- Monetary Authority Actions

  Early Federal Reserve programs were directed at institutional investors:

  - March 20: Munis included in the Money Market Liquidity Facility (MMLF)
  - March 23: MMLF collateral expanded to include VRDNs

- Fiscal Policy Actions

  The CARES Act provided direct market support to the broad economy:

  - March 23 - 27: Congressional negotiations and passage
  - Provided support to S&L governments
  - Created backstop Federal Reserve facilities

- Joint Action: Municipal Liquidity Facility (MLF)
  - Approved by CARES Act and Backed By U.S. Treasury
  - Announced By Federal Reserve on April 9
  - Purchases newly issued, short-term bonds directly from issuers

This Paper

Questions:

- How did the series of policy interventions change investors' pricing of liquidity vs. credit risks in the muni market?

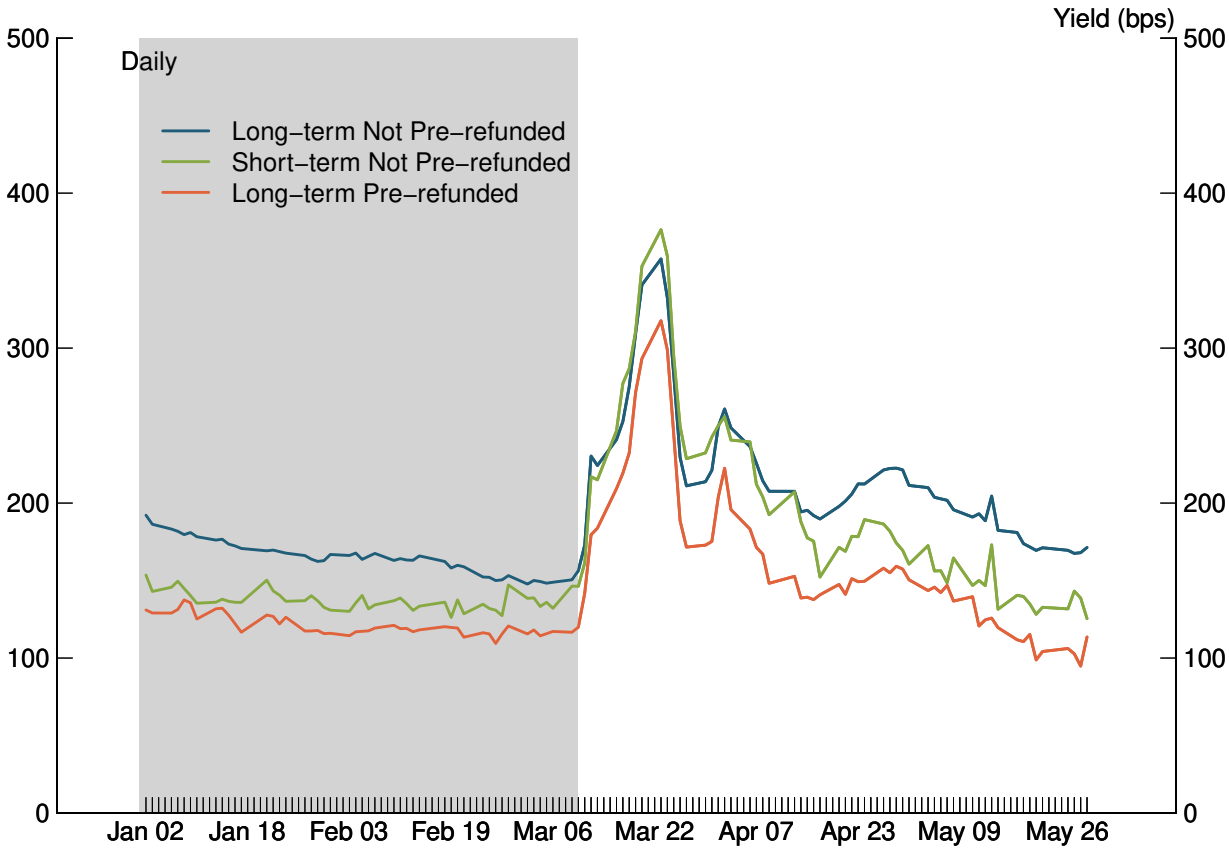
Research design:

- Use pre-refunded bonds to differentiate liquidity vs. credit risks.
  - Pre-refunded bonds are backed by an escrow account funded by a "refunding" issuance.
  - They are subject to liquidity risks but not issuer-specific credit risks.

Data: Simple Average Yields

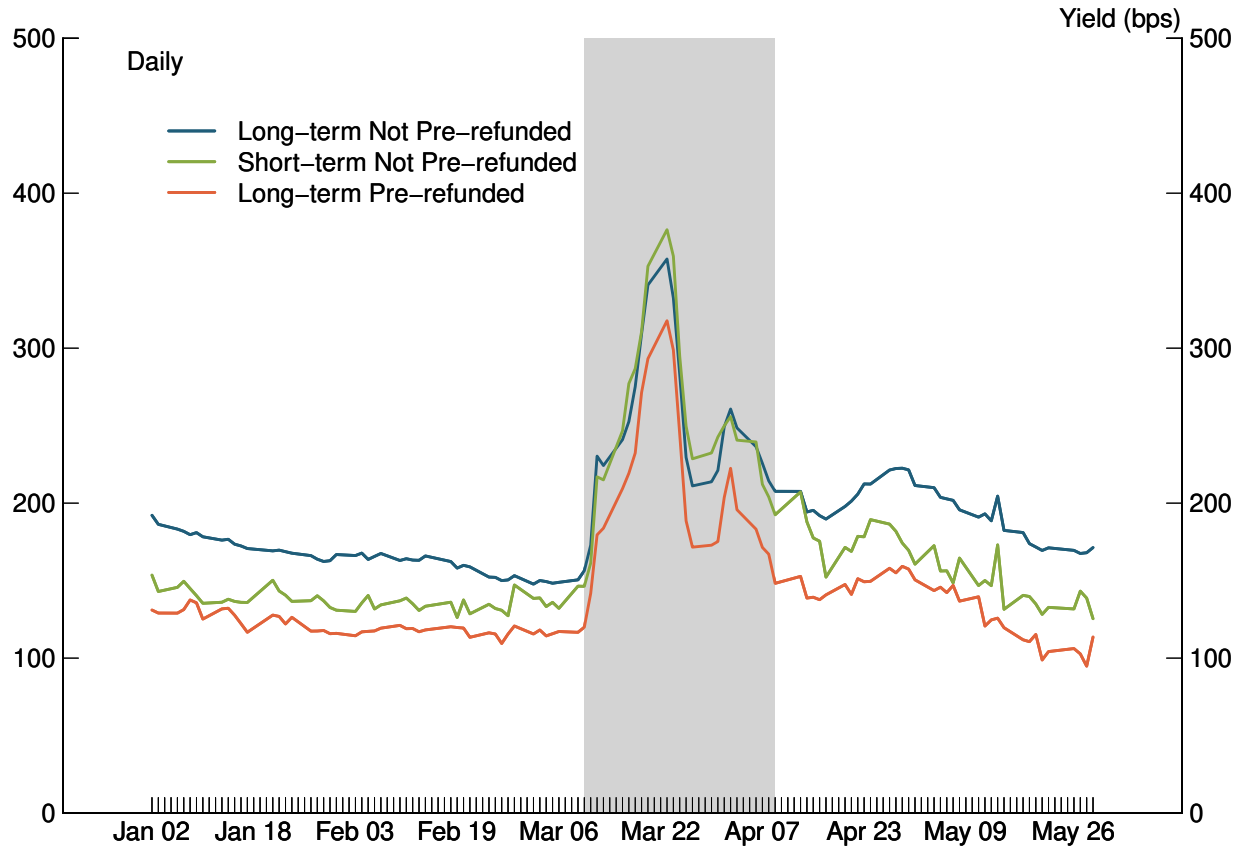
Simple Average Yields: Pre-pandemic

- Pre-refunded bonds had the lowest yields: no credit risks.
- Non-pre-refunded bonds had higher yields: credit risks.
  - Long-term bonds have higher yields than short-term bonds.



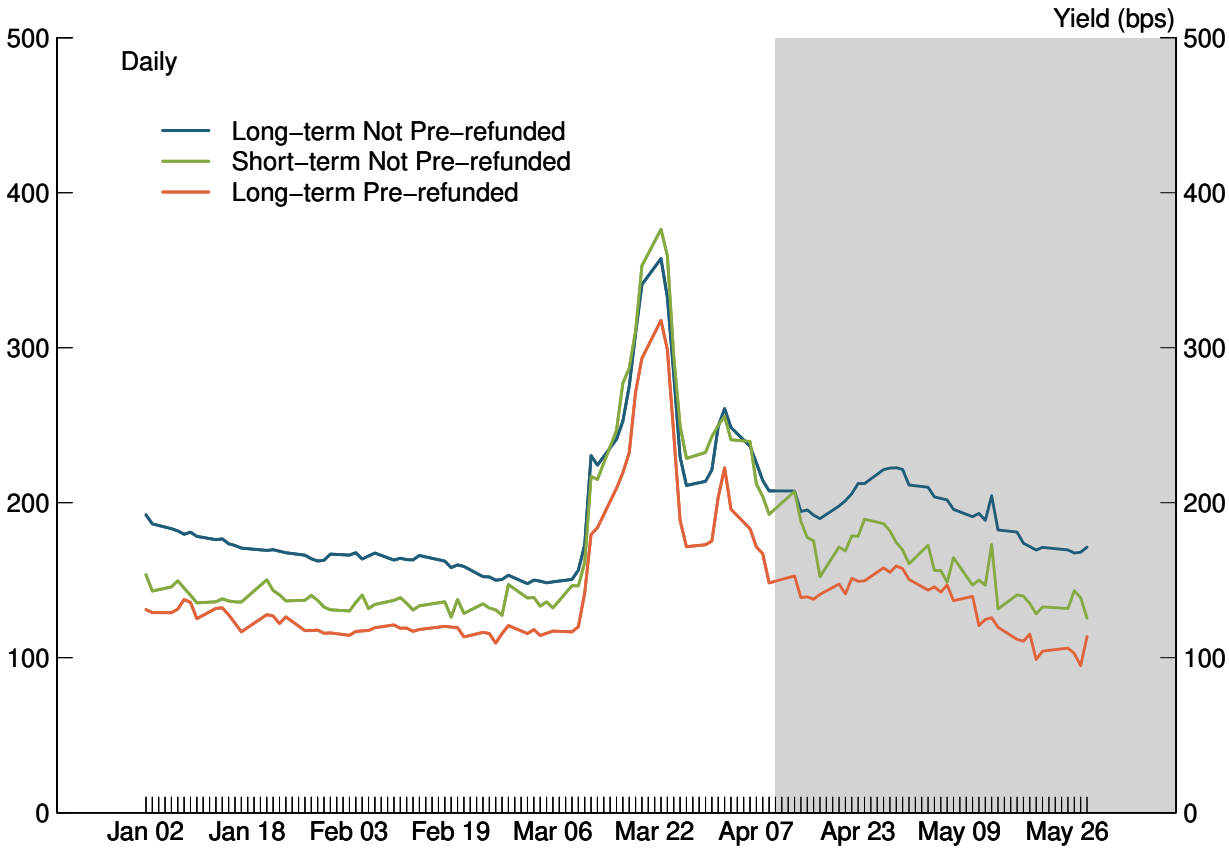
Simple Average Yields: March 2020

- Pre-refunded bond yields rose significantly: elevated liquidity risks.
- Non-pre-refunded bonds with inverted yield curve: possibly credit risks.



Simple Average Yields: Post-Interventions

- Pre-refunded yields declined: lower liquidity risks.
- Non-pre-refunded yields moved lower, to different degrees: potentially different credit risks

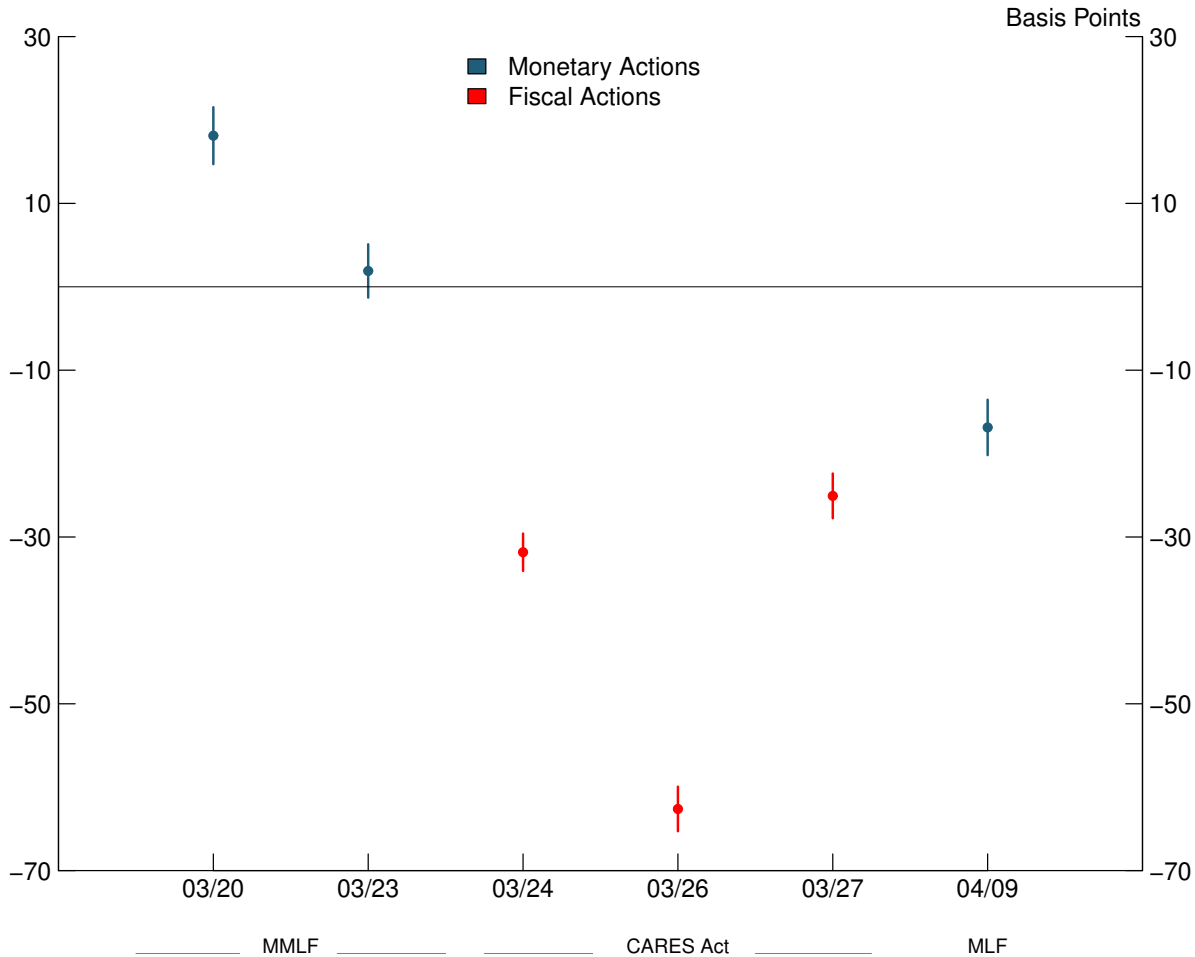


Event Study:
Immediate Impact of Each Policy Intervention

- Average yields are illustrative of our findings
- Next, we compare bonds
  - among similar issuers, maturities, and dates
  - across pre-refunded status
  - focus on narrow trading windows around the news/announcement

Immediate Impacts of Policy Interventions

- News on CARES Act and MLF: significant declines in yields.
- Limited impacts from MMLF actions.



Regression

Immediate Impacts: Credit vs. Liquidity Risks

- Differentiate pre-refunded vs. non-pre-refunded bonds.
- Policy news stabilized yields through lower liquidity risks, but didn't immediately ease credit concerns.

Effect of Key CARES Act Procedural Events on Muni Yields

	(1) Agreement	(2) Senate Vote	(3) Enactment	(4) MLF
Intervention	-26.37***	-67.67***	-27.73***	-16.70***
	(3.91)	(4.72)	(4.40)	(6.24)
Intervention × *Not Prerefunded*	-5.72	5.26	2.82	-0.17
	(4.16)	(4.90)	(4.49)	(6.21)
Observations	18,277	10,800	9,502	5,875
Adjusted R^2	0.67	0.82	0.81	0.94

Policy Impacts over Time: Credit Risks

The event study estimates immediate impacts

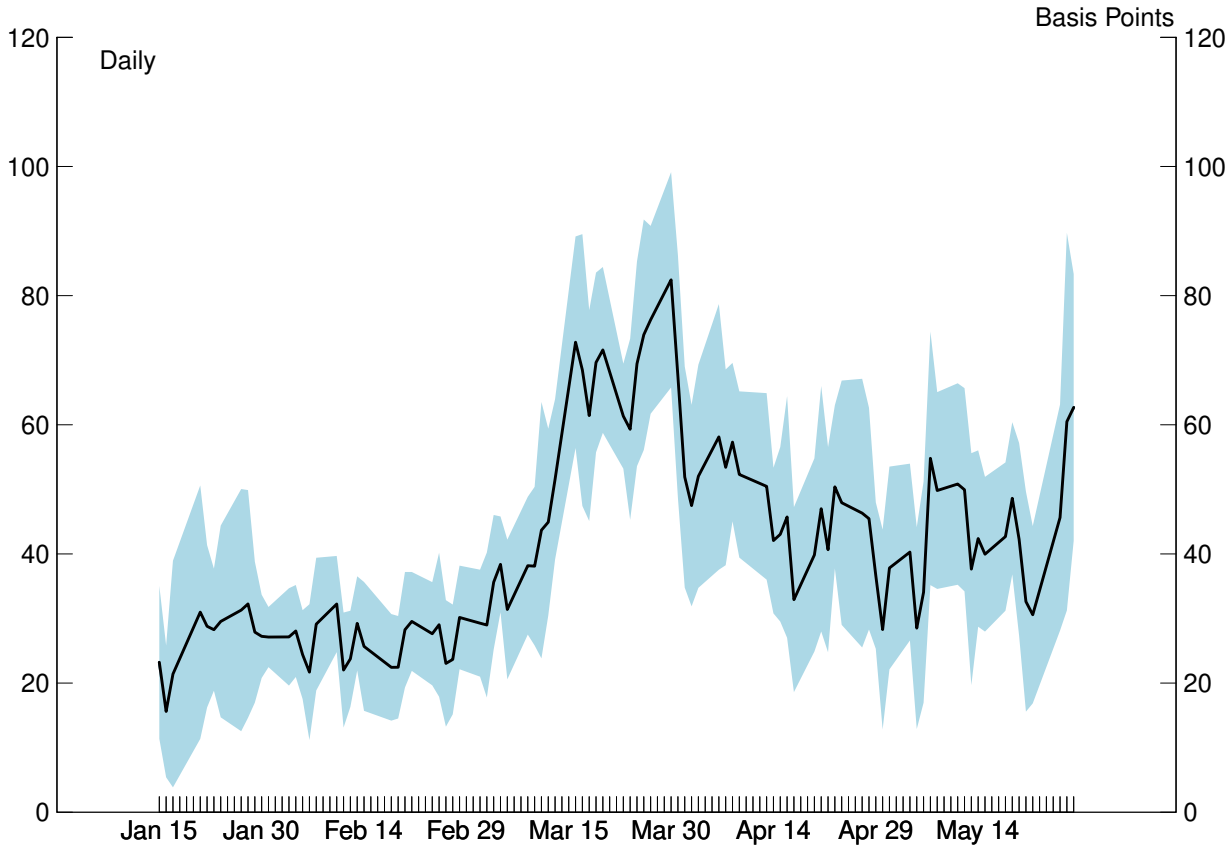
- But the impacts may take time to materialize

Next, compare pre-refunded and non-pre-refunded daily over the sample

- Result tells us how the relative spreads change over time
- Prior to and following the interventions
- Again allows for bond, issuer, and trade controls

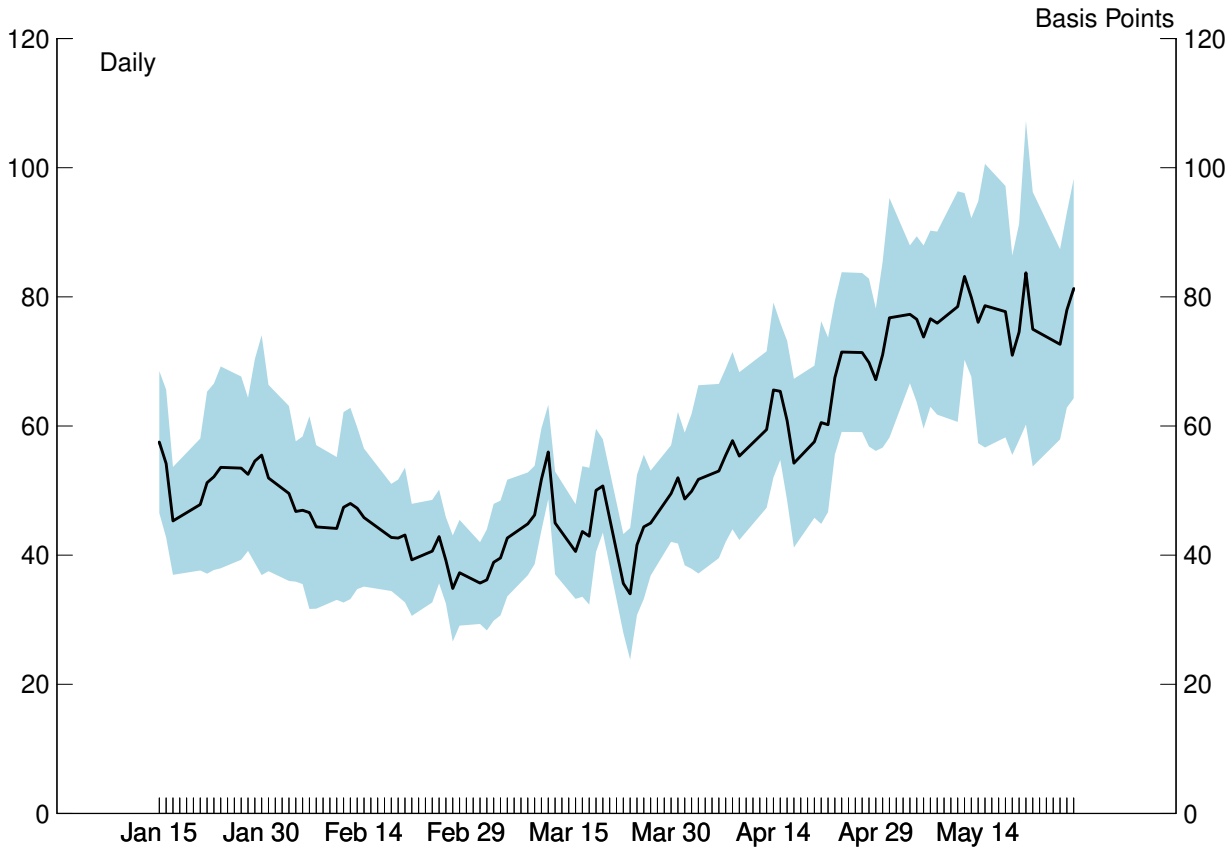
Relative Short-term Bond Yields Spiked In March

- Daily regression: pre-refunded vs. short-term non-pre-refunded bonds.
  - ▸ Regression details
- Credit risks rose in March, retreated prior to MLF announcement, and continued to decline in April $\rightarrow$ interventions reduced near-term default risks.



Relative Long-term Yields Began to Rise After Crisis

- Credit risks were largely stable in March, but rose in April and May.
  - Expectation of a longer recession.
  - Limited policy support



▸ Further evidence

Findings

Immediate impacts within a narrow trading window:

- News of policy interventions stabilized muni yields significantly by lowering liquidity risks.
- But they didn't immediately ease credit concerns.

Impacts over a longer period of time:

- At the onset of the pandemic, credit risks were an important component in short-term bond yields, but remained largely unchanged for long-term bonds.
- Following policy interventions, credit concerns eased for short-term bonds, but became more pronounced for long-term bonds.

Appendix

Event Study

$$
\begin{aligned}
yield_{b,t} &= \beta_0 + \beta_1 I_t^{policy} + \gamma X_{b,t} + \eta_b + \varepsilon_{b,t} \\
yield_{b,t} &= \beta_0 + \beta_1 I_t^{policy} + \beta_2 I_t^{policy} I_b^{npre} + \gamma X_{b,t} + \eta_b + \varepsilon_{b,t}
\end{aligned}
$$

- Include trade specific controls: trade amount, principal amount, and trade type.
- Control for CUSIP level fixed effect.
- Exploit within CUSIP variation.

return

Rolling-window Regression

$$yield_{i,t}(n) = \alpha_{c,t}(n) + \beta_t I_i^{npre}(n) + \gamma X_{i,t}(n) + \varepsilon_{i,t}(n) \tag{1}$$

- Include bond specific controls: remaining maturity, trade amount, principal amount, trade type, and bond rating.
- Control for county fixed effects.
- Compare bonds within a county.

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Credit Risks across Ratings

$$
\begin{aligned}
p_{i,t} = \; & \alpha_{s,t} + \beta_1^r I_i^{rate} + \beta_2^{rm} I_i^{rate} \times I_t^{policy} \\
& + \beta_1^n I_i^{npre} + \beta_2^{rn} I_i^{rate} \times I_i^{npre} + \beta_3 I_i^{rate} \times I_i^{npre} \times I_t^{policy} \\
& + \gamma^c X_{c,t} + \gamma^i X_{i,t} + \varepsilon_{i,t}
\end{aligned}
$$

	BBB and Lower		A and Lower	
	(1)	(2)	(3)	(4)
	Yield	Spread	Yield	Spread
Not Prerefunded	49.610***	48.380***	47.564***	46.334***
	(5.002)	(4.970)	(4.632)	(4.554)
Rating	20.591***	19.925***	4.862	4.005
	(6.313)	(6.765)	(5.494)	(4.929)
Not Prerefunded × *Rating*	52.373***	47.287***	31.756***	29.856***
	(12.479)	(13.217)	(9.101)	(8.710)
Not Prerefunded × *MLF*	14.590***	16.957***	14.442***	16.447***
	(1.927)	(1.930)	(2.104)	(2.108)
Rating × *MLF*	-0.209	-0.813	6.203	4.970
	(14.197)	(13.749)	(7.701)	(7.274)
Not Prerefunded × *Rating* × *MLF*	41.770***	47.263***	11.694	16.208**
	(14.402)	(13.793)	(8.347)	(7.547)
Observations	926,898	926,898	926,898	926,898
Adjusted R^2	0.62	0.73	0.60	0.72

return