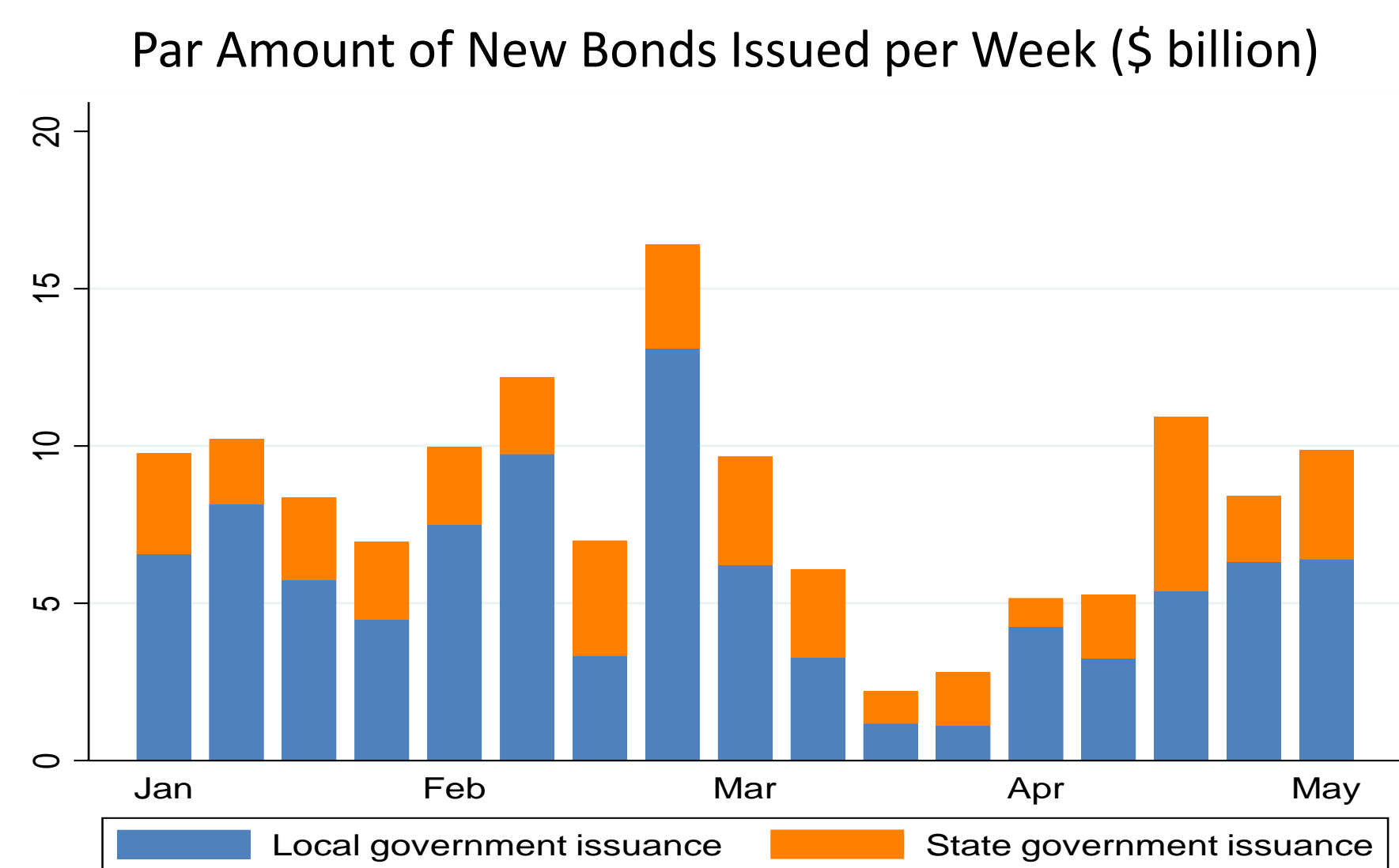


Municipal Finance During the COVID-19 Pandemic: Evidence from Government and Federal Reserve Interventions

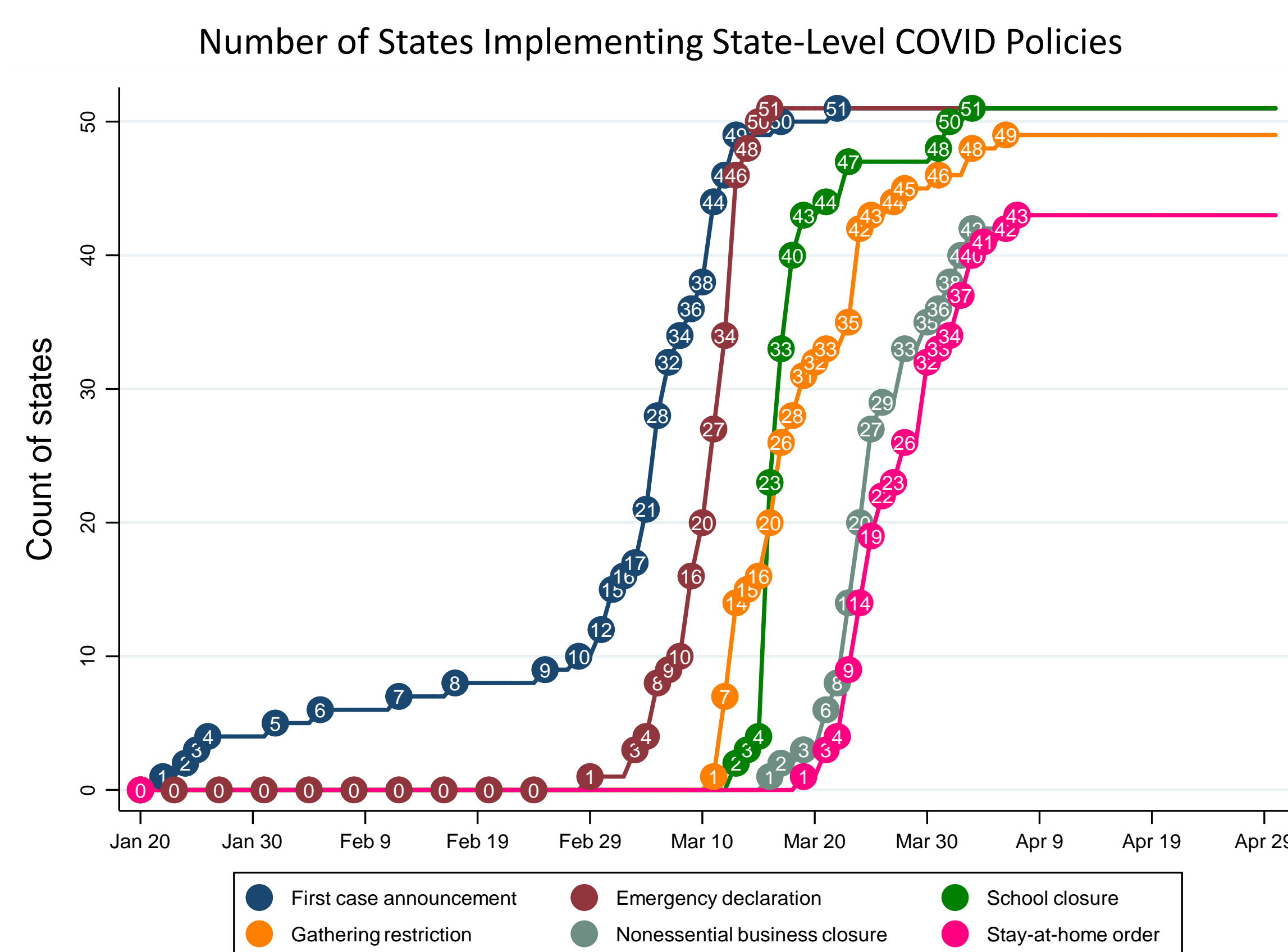
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2022 AFA Annual Meeting

Motivation

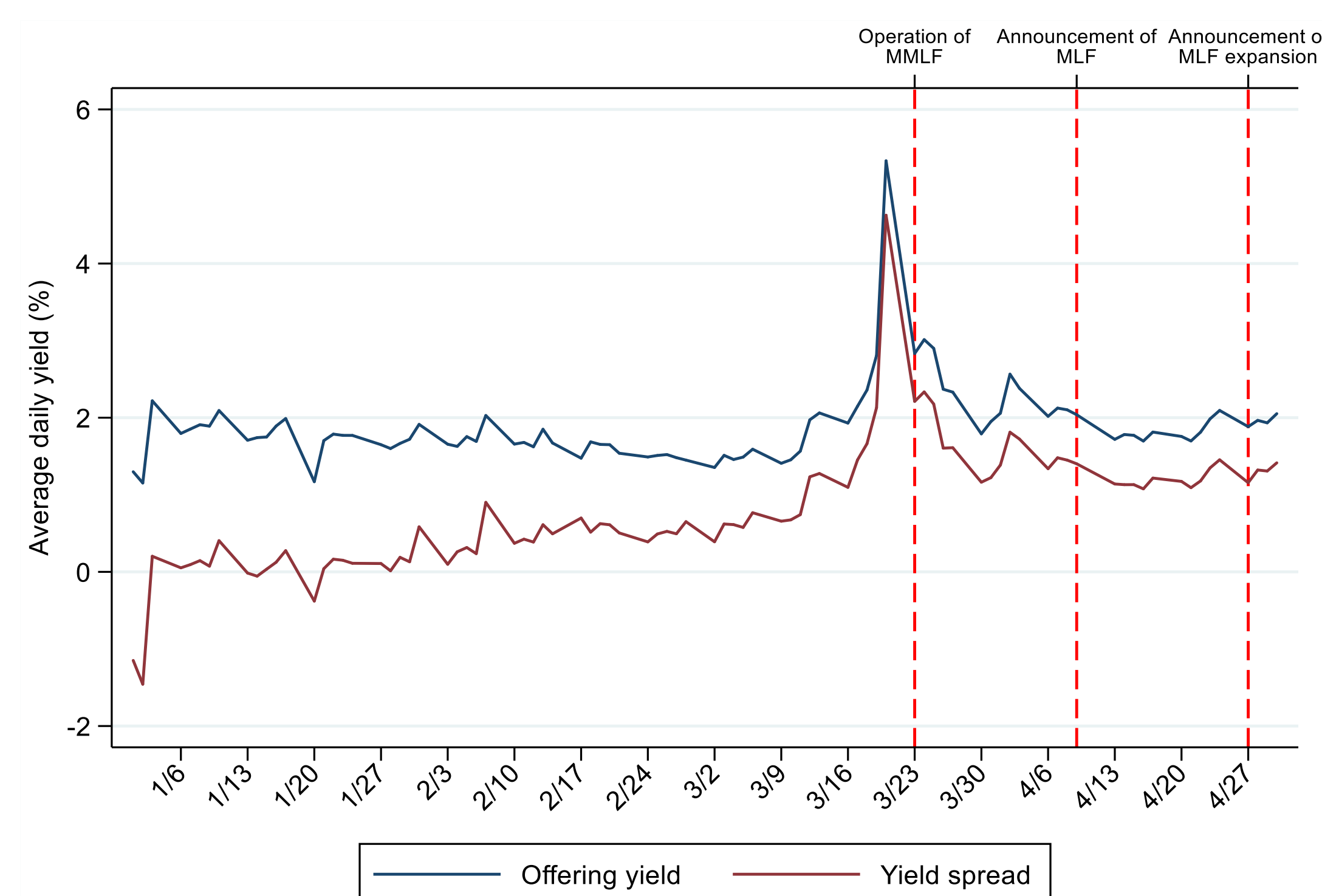
Generally considered a haven by investors, the municipal debt market in the U.S. experienced a **sharp sell-off** amid the COVID-19 outbreak, leading to less bond issuance than the worst level during the financial crisis.



Counties and states successively implemented multiple local policies to reduce the spread of the virus such as stay-at-home orders.



To calm the municipal finance market, the Federal Reserve implemented unprecedented interventions: 1) Money Market Mutual Fund Liquidity Facility (MMLF) effective March 23, 2020, and 2) Municipal Liquidity Facility (MLF) effective May 23 and announced on April 9, 2020.



Research Questions

1. How did the municipal bond market react to **COVID infections**?
2. How did **local government** policies affect the market?
3. Did **Fed's policies** calm the market?
4. Any different impact for resilient sectors and fiscally healthy states?

We investigate the impact at both the extensive margin (frequency of new issuances & number of issues) and the intensive margin (offering yields).

Empirical Approach

For question #1 (direct impact from COVID), we use a panel data regression below at bond(i)-county(c)-day(t) level where the dependent variable is the offering yield or yield spread.

$$Yield_{ict} = \alpha + \beta COVID\ Severity_{ct} + \gamma X_i + \delta_c + \theta_t + \delta_c \times t + \varepsilon_{ct}$$

For questions #2 & 3 (impact from government policies), we use an event-study methodology and control for bond attributes at bond(i)-county(c)-week(t) level. Govt Policy is a dummy variable indicating whether it is τ weeks apart relative to the policy event week.

$$Yield_{ict} = \alpha + \sum_{\tau=-4}^{-1} \beta_{\tau} Govt\ Policy(\tau)_{ct} + \sum_{\tau=0}^4 \beta_{\tau} Govt\ Policy(\tau)_{ct} + \gamma X_i + \delta_c + \delta_c \times t + \varepsilon_{ct}$$

To examine the impact on the extensive margin, we also conduct the analyses above at county-day (county-week) level where the dependent variable is the corresponding occurrence of issuance or the number of issues.

Data & Key Variables

- COVID-19 infection and mortality
 - Statewide first case announcement dates
 - Count of cases and deaths
- State and local government policies
 - Emergency declaration
 - School closure
 - Gathering restriction
 - Nonessential business closure
 - Stay-at-home (SAH) order
- Municipal bonds
 - Issuer characteristics
 - Offering yield (aka yield at issue)
 - Bond characteristics including bond size, sector, ratings, etc.
- Municipal sectors
 - Resilient sectors: essential service sectors, such as water/sewer, utilities and housing
 - Non-resilient sectors: transportation and dedicated tax bonds
- Fiscally unhealthy states
 - States with a shortfall of more than 5% of their total 2019 revenue in a moderate recession

Main Findings

During the first four months of 2020 since COVID-19 emerged, investors' appetite for a county's new municipal bonds is **negatively** associated with the pandemic's severity, especially regarding number of deaths.

The more severe the pandemic situation, the higher the offering yield demanded by investors and the less the issuance activity.

	Offering yield (%)		Number of issues	
	(1)	(2)	(3)	(4)
Log (1+ # cases)	0.073*** (0.017)		-0.024*** (0.003)	
Log (1+ # deaths)		0.113*** (0.031)		-0.053*** (0.01)
Observations	27,441	27,441	31,380	31,380
Adj. R-squared	0.78	0.78	0.21	0.21

* Includes bond-specific controls, country FEs, day FEs, and county × day trend.

Main Findings (contd.)

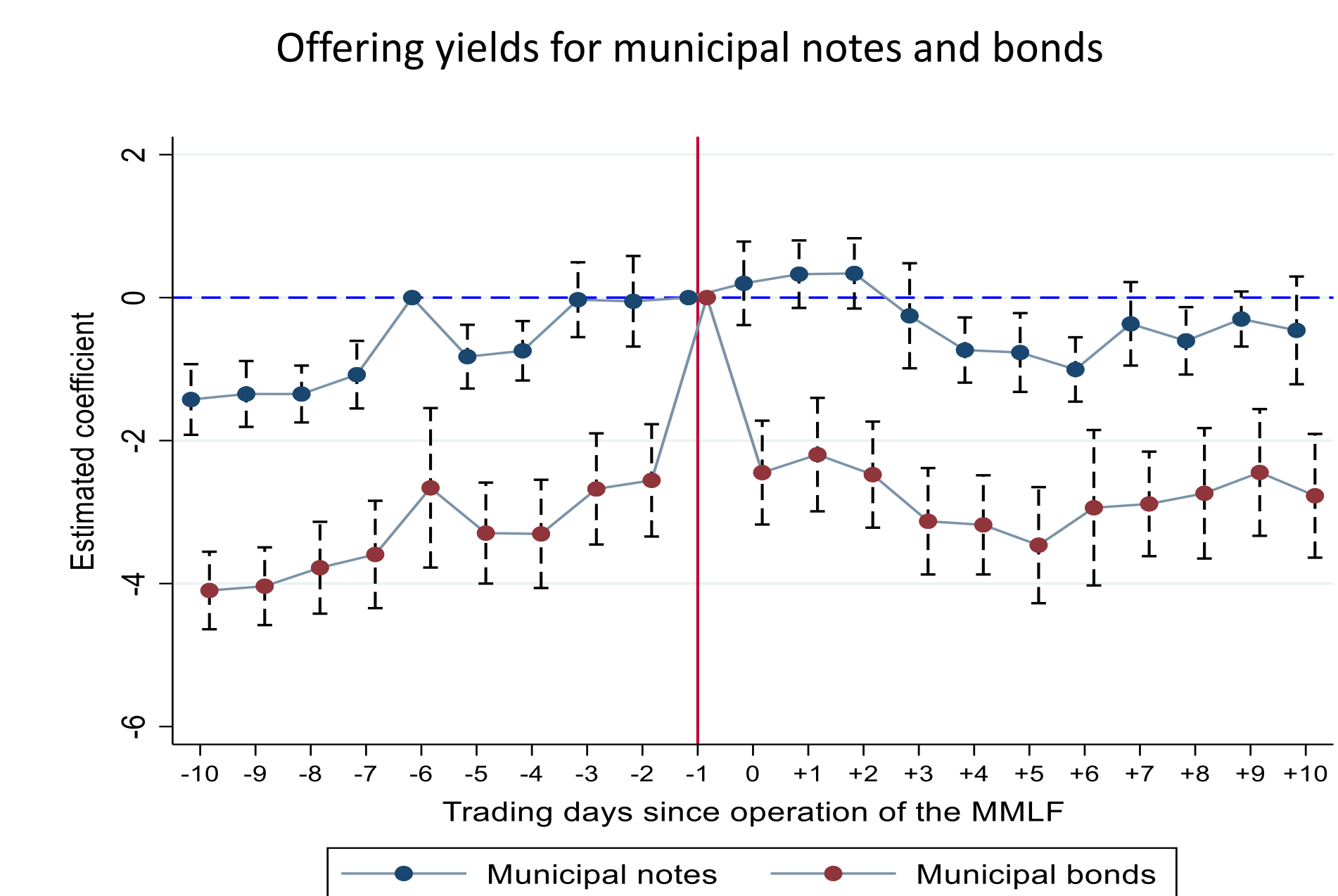
At county level, offering yields increased by 74 bps during the emergency declaration week, compared to an average offering yield for newly issued muni bonds of 1.74%.

This effect is more severe for non-resilient sectors and fiscally unhealthy states. The impact is accompanied by less issuance activity post emergency declaration.

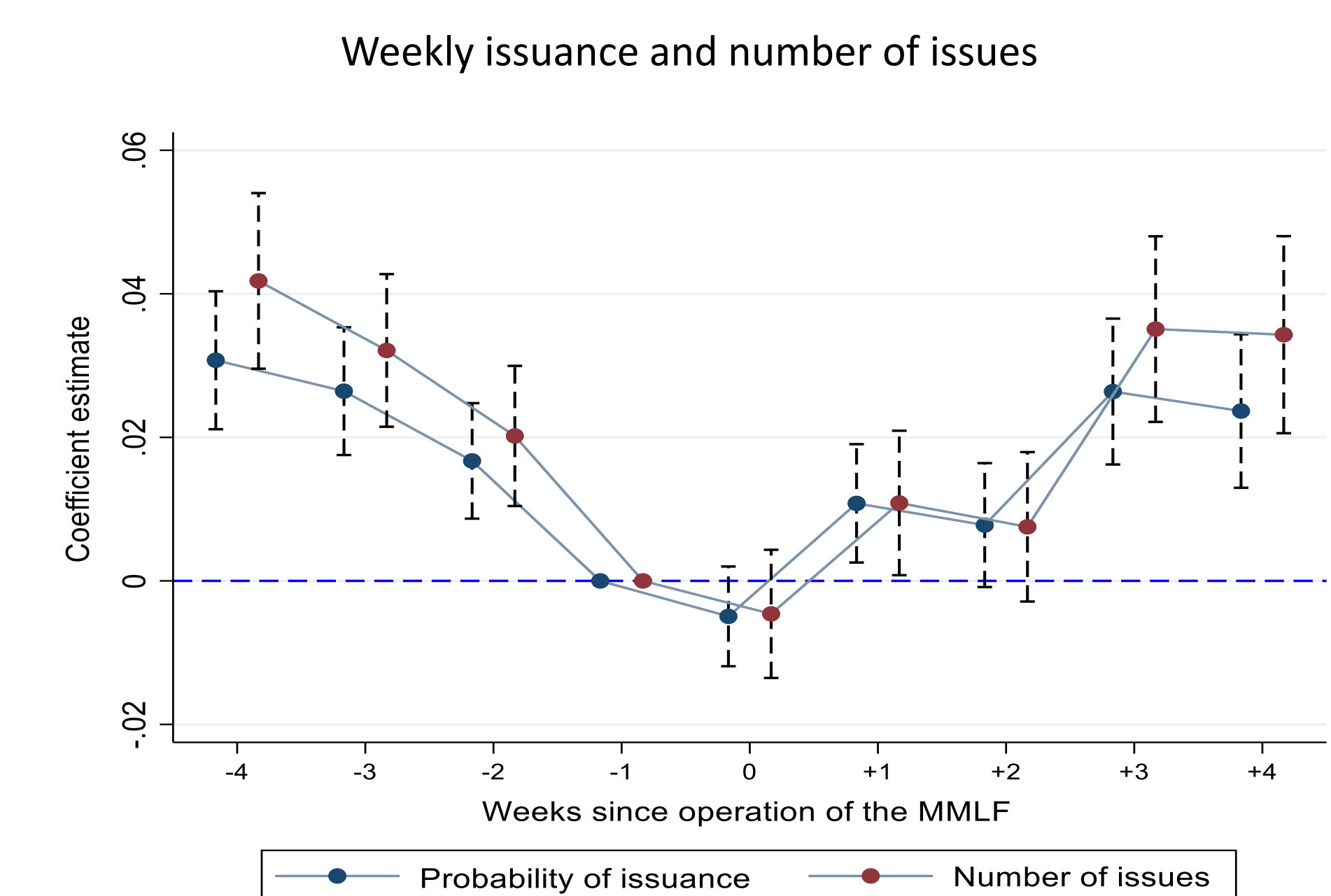
	Offering yield (%)		
	(1)	(2)	(3)
Emergency	0.737*** (0.063)	0.773*** (0.065)	0.715*** (0.068)
Emergency × Resilient sector		-0.383*** (0.142)	
Emergency × Fiscally unhealthy			0.197** (0.089)
Observations	14,398	14,398	14,398
Adj. R-squared	0.79	0.79	0.79

* Includes bond-specific controls, country FEs, and county × week trend.

Relative to March 20 (Day = -1), offering yields dropped about 200 bps on March 23 when the MMLF became operational. While MMLF targets short-term municipal notes (<3y), the effect is stronger and immediate for longer maturity bonds (>3y).



New issuance only picked up in the second week post MMLF. The probability of issuance is 1.1 percentage points higher, comparing to the unconditional probability at county level of 3.3%. We find similar patterns around the announcement of the MLF.



Conclusion

- The average offering yield (on the intensive margin) increases, and the number of new issues (on the extensive margin) decreases when county-level COVID-19 case and death counts rise.
- Emergency declarations, among various local government policies, exerted the most **negative** impact.
- Investors shunned transportation and dedicated tax bonds, which were hit the hardest. Similarly, bonds issued in fiscally unhealthy states experienced weaker investor demand.
- The Fed's interventions through the MMLF and MLF were **successful** in calming the market.



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