Policy Proposal: New Facility for Monetary Policy Targeting Municipalities

To: Federal Reserve Board of Governors
Issue: Insufficient liquidity and high costs in municipal lending markets.

Executive Summary

Municipalities face a new set of fiscal challenges: tax revenues have fallen, operational costs have risen, and borrowing costs are elevated. The Federal Reserve Board's (FRB) creation of a Municipal Liquidity Facility (MLF) does not go nearly far enough. The FRB can ease the financial burden facing state and local governments by setting up a new Municipal Secondary Market Facility (MSMF). We model the expected change in borrowing cost for a set of municipalities and recommend spending $600bn in secondary markets. Furthermore, we identify direct and indirect channels by which state governments may benefit.

Background

State & Local Government

The advent of the novel coronavirus has impacted the fiscal wellbeing of states and municipalities. Both levels of government have suffered from deteriorating tax revenue, driven by reduced consumption and rising unemployment.[1] Moreover, state governments face additional challenges, including unfunded pension obligations[2] and costly programs like Unemployment Insurance.[3]

Rising costs have created large budget deficits for state and municipal governments. State budget deficits have been especially large for the largest states; New York and California, for example, expect to run deficits of 10-15% and above 20%, respectively.[4] At the local level, municipalities expect large budget deficits. New York, NY, for example, faces a budget shortfall of $9.7bn in FY 2020/21[5].

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[1] "A Preliminary Estimate of Job Losses & Tax Revenue Declines." New York City Independent Budget Office, April 2020.
[2] Please refer to Appendix V
[3] See Note 1 above
[4] See Note 1 above
[5] See Note 1 above

FRB Response & Result

The FRB has responded to economic deterioration by establishing several lending facilities, including allotting $500bn for the MLF secured by $35bn issued by the Treasury.[6] However, actions by the FRB have unevenly benefited different markets. While investment- and junk-grade corporate bond broad market indices have gained ~10% since March 23rd, municipal security broad market indices have only gained ~1%, as indicated by ICE BoA indices.[7] This is suggestive that FRB actions have not been sufficient to quell risk-aversion by investors. Should the FRB not intervene further, state and local governments will suffer; higher borrowing costs increase their immediate budget costs and discourage borrowing.

Recommendation & Analysis

Headline Recommendation

We recommend that the FRB take steps to inject liquidity and ease frictions within the secondary market for municipal securities. This consists of:

1. **Setting up a new secondary market facility to inject up to $600bn in the municipal securities secondary market.** Although the Fed has announced several bond-buying programs, it has spent only a fraction of what it has committed.[8] We estimate that increasing spending will reduce borrowing costs by 30-50bp, lowering the cost of borrowing for newly issued bonds and lowering debt servicing costs through refinancing.

2. **Easing restrictions on bond-buying, which includes increasing the number of eligible municipalities and lowering the demanded spread of bonds purchased.** Reducing the number of restrictions (e.g. population requirements) will benefit both individual municipalities as well as the broader market. Furthermore, reducing the spread expected by the FRB will have an immediate effect, both on the cost and willingness to borrow.

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[6] "FAQs: Municipal Liquidity Facility." FAQs: Municipal Liquidity Facility - Federal Reserve Bank of New York. Accessed June 14, 2020.
[7] Scaggs, Alexandra. "Cities and States Need Funding Help. It Won't Come Cheap." Cities and States to Need Federal Reserve Help. What That Means for Municipal Bonds. - Barron's. Barrons, May 20, 2020.
[8] Wirz, Matt. "Fed Promised to Buy Bonds but Is Finding Few Takers." The Wall Street Journal. Dow Jones & Company, June 3, 2020.

Methodology

To model the effects of our new facility, we:

1. Estimated the effect of **a new FRB funding facility** on interest rates, using data from QE2 as a reference.

2. Used these estimates to model the effect of a **similar funding facility on municipal securities** using the Capital Asset Pricing Model (CAPM).

3. Applied a **multiplier effect** based on the size of securities market and level of spending.

4. Selected **five representative municipalities** to analyze: New York, NY; Los Angeles, CA; Detroit, MI; Houston, TX; and Allentown, PA. These cities were chosen for **diversity in size, geography, and economic conditions**.

Please refer to Appendices II-IV for further clarification of methodology.

Impacts of Policy

There are two direct channels through which this policy acts:

1. **New issuance:** State and local governments will be able to borrow newly-issued securities at lower rates to cope with the impacts of COVID-19. California, for example, expects a ~$20bn government deficit as a result of COVID-19. Were it to issue new bonds to cover this expenditure, a 50bp reduction would translate to $100mm reduction in annual interest payments. The full estimates for our five representative municipalities is given in Table 1 in Appendix I.

2. **Refinancing:** Municipalities will be able to take advantage of lower rates by refinancing. For New York City, refinancing 20% of its debt would save approximately $54mm in annual expenditures. As a point of reference, NYC's expected expenditures on Unemployment Insurance is $23mm, demonstrating a clear use of funds.[9] The estimates for our five representative municipalities is given in Table 2 in Appendix I.

In addition to these direct channels, the presence of $600bn of secondary market support will boost investor confidence and increase the amount of liquidity available to municipalities. Since the

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[9] de Blasio, Bill. "Executive Budget Fiscal Year 2021." The City of New York, April 2020.

start of the crisis, $45bn in municipal investment has dried up.[10] A new Fed-backed facility could restore this sorely-needed funding.

Eligibility & Implementation

In addition to the level of spending, several key aspects of the implementation of this new facility will determine its success. This includes the **eligibility criteria** and **spread** expected on securities.

1. **Eligibility:** While cities eligible for MLF lending are required to consist of more than 100,000 residents, we recommend expanding the number of eligible cities within this new program[11]. Doing so will increase liquidity of the broader market and benefit underserved, smaller communities.

2. **Spread:** The FRB currently expects a high spread on securities to compensate the purchasing risk: below investment grade debt will only be purchased at a spread of 590bp, which imposes severe borrowing constraints.[12] As evidenced by our estimates, even a 50bp reduction in spread goes a long way in servicing municipalities.

Conclusion & Next Steps

We conclude that the Federal Reserve can provide a windfall to states both by increasing the size of its municipal bond-buying program and by adjusting its implementation. However, this policy in and of itself will not resolve the budgetary problems facing states — in order to fully support state and local governments, Congress must leverage its fiscal power to cover the deficits run by state governments.

Word Count: 972

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[10]See Note 7 above
[11] See Note 6 above
[12] Newyorkfed.org. 2020. *Municipal Liquidity Facility Pricing Index.* [online]

Appendix I: Estimated Savings

Table 1: Anticipated Annual Savings on Newly Issued Bonds

Municipality	Anticipated Annual Savings (Thousands of $)	Annual Savings per resident ($)
New York City	28,129	3.39
Los Angeles	1,385	0.35
Detroit	651	0.97
Houston	47	0.02
Allentown	3	0.02

Table 2: Anticipated Annual Savings from Refinancing 20% of Existing Debt

Municipality	Anticipated Annual Savings (Thousands of $)	Annual Savings per resident ($)
New York City	56,540	6.81
Los Angeles	27,806	6.99
Detroit	38,194	57.0
Houston	3,187	1.37
Allentown	190	1.57

Appendix II: Code and Data Sources

The code for this project is available here: https://github.com/darrenwchang/covid-hackathon-20.
The datasets are not appended because of size.

Source	Use
Mergent Municipal Bond Securities Database	Bond Offerings
Federal Reserve Economic Database (FRED)	Treasury Yield Rates
U.S. Treasury (through Quandl)	Treasury Yield Curve Rates

Appendix III: Modeling the Effects of Quantitative Easing

Our model of a hypothetical Federal Reserve funding facility begins by examining the effects of similar programs, commonly known as Quantitative Easing, in the past. In particular, we focus on measuring the impacts of QE2, a $600bn Treasury-security purchase program announced in November 2010. We chose to focus on QE2 because it was targeted at Treasury securities, a relatively transparent and liquid market.[13]

Instead of attempting to endogenously model the effects of Federal Reserve spending on the yield curve, we instead use the market reaction to the announcement of QE2 as a proxy for measuring the contemporaneous effects on interest rates. This is an approach similar to that of Krishnamurthy and Vissing-Jorgensen.[14] Market expectations are a good approximation for contemporaneous effects in efficient, thickly traded markets, such as the market for Treasury securities.

The effects of the QE2 program announcement are extracted using Regression Discontinuity Design (RDD) with a linear time control. Treasury data for end-of-day treasury securities yields for 10 days before and after each program announcement are used.[15] From this, we can estimate how the QE2 program announcement shifted the yield curve. The estimates are given below.

Maturity	Effect Size (bp)	Effect Size (% of previous rate)
1YR	-0.6909	-3.14%
3YR	-15.6364	-31.9%
5YR	-13.2546	-11.94%
7YR	-22.2000	-12.00%
10YR	-16.9818	-6.36%
20YR	-3.8182	-1.03%
30YR	+4.3636	+1.07%

[13] In theory, we could have also used the Federal Reserve's recently announced Treasury security purchase program. However, due to timing, it is impossible to separate the effects of the most recent round of quantitative easing on interest rates from the effects of the still-ongoing COVID-19 crisis.

[14] Krishnamurthy, Arvind, and Annette Vissing-Jorgensen. "The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy," 2011. https://doi.org/10.3386/w17555.

[15] The choice of 10 days is not particularly important. We wanted to make the time frame small enough that there would be few systematic differences in the treasury markets before and after the announcement, apart from the QE2 program announcement itself. The results are unchanged if we change it to 5 days, for example.

Appendix IV: CAPM Model of Municipal Bonds

The Capital Asset Pricing Model (CAPM) is a method of relating systematic risk and expected return for assets.[16] This can be used for finding measures of return for municipal bonds, as in Chalmers (2016).[17] The formula is given by

$$R_a = R_f + \beta(R_m - R_f)$$

where R_a is the expected return of investment (the specific municipal bond in this case), R_f is the risk-free rate (which is matched by maturity and year to the Treasury yield), β is the correlation of the bond to the market, and R_m is the return on the bond market.

We assume the market return is stable within each year to aggregate on the annual level, in addition to the standard CAPM assumptions. The dataset in question is the most recent Mergent municipal bond data set, which contains data about the yield to maturity at the time of issuance, which measures the expected return to investment in the municipal bond. We compute the market return by grouping municipal bonds into buckets based on maturity and year (i.e. 1970 - 30 year maturity) and averaged across the bucket. Then, we calculate $\beta = \frac{Cov(R_a, R_m)}{Var(R_m)}$.

Using the effect sizes from Appendix III, we can extract expected changes in R_m from refinancing. We assume that municipalities will choose not to refinance 30 year securities, since QE programs would be expected to raise their interest rates (we also assume municipalities will not issue 30 year securities to cover COVID-related funding shortfalls, due to the timescales involved). From there, we can combine the changes in R_m, our estimates for β, and the Mergent municipal bonds dataset to estimate savings from both refinancing old debt and issuing new debts. A broad summary of the most important numbers are given below.

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[16] Kenton, Will. "Capital Asset Pricing Model (CAPM)." Investopedia. Investopedia, April 30, 2020. https://www.investopedia.com/terms/c/capm.asp.

[17] Chalmers, John M.r. "Systematic Risk and the Muni Puzzle." *National Tax Journal* 59, no. 4 (December 2006): 833–48. https://doi.org/10.17310/ntj.2006.4.05.

Municipality	β	Avg. change in interest rate (bp)
New York City	1.06	-29.18
Los Angeles	1.13	-26.79
Houston	1.30	-15.89
Detroit	1.05	-33.72
Allentown	0.624	-3.203

Appendix V: Miscellaneous

Contributions to Pension Funds as % of Revenue[18]			
City	Actual	Necessary	Shortfall
Chicago	32.6%	60.1%	27.5%
Philadelphia	16.8%	10.6%	-6.2%
Boston	15.3%	17.9%	2.5%
Milwaukee	14.8%	45.9%	31.1%
San Jose	14.5%	23.8%	9.3%
Los Angeles	13.9%	27.4%	13.5%
San Diego	12.4%	15.9%	3.5%
Jacksonville	11.8%	21.8%	10.0%
Baltimore	11.3%	14.2%	2.9%
New York	10.6%	13.2%	2.6%

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[18] Robert Pozen, J., 2020. *Muni Bond Investors Could Lose Out As Pension Crisis Cripples Many U.S. Cities.*