# Dealers and the Dealer of Last Resort: Evidence from MBS Markets in the COVID-19 Crisis

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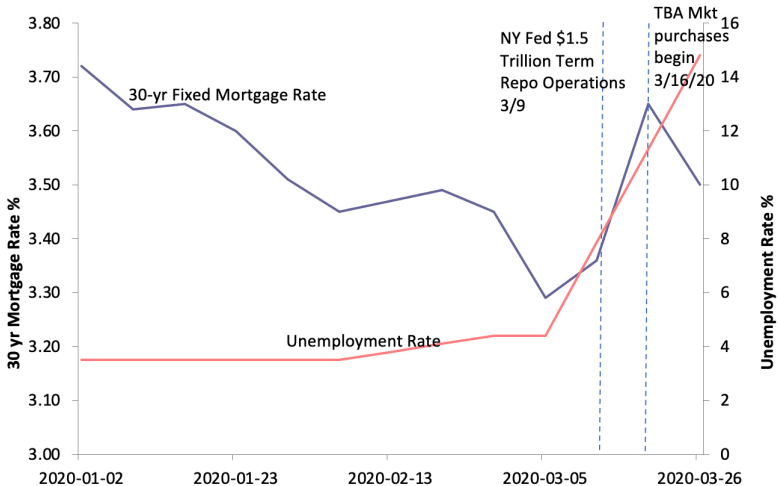
# Mortgage Rates and Unemployment Spiked after COVID-19 US Cases Confirmed



# Motivation

Fed acted quickly in unchartered waters with unconventional tools

- Post Financial Crisis: Dealers are BHCs $\rightarrow$ constrained due to regulation & leverage ratio restrictions
- Dealers are regulated in part by the Federal Reserve

Optimal policy $\rightarrow$ need to understand mechanisms by which tools mitigated disruptions

- This paper gets us closer to understanding optimal policy

# This Paper: Main Contributions

1. MBS arbitrage relationship $\rightarrow$ analyze dealer trading behavior
   - Establish 3 inventory costs
   - Map costs to observable metrics: “payup” and “option adjusted spread" (OAS)
   - Use these to study distortions in dealer trading during COVID due to $\uparrow$ costs
     - Risk premium (OAS) spiked
     - Price differentials reversed, consistent with $\uparrow$ costs
   - Many robustness tests here
2. What were the effects of the Fed’s tools on dealers’ inventory costs?
   - Argue balance sheet constraint is largest cost
   - Fed $t + 3$ purchases had largest effect

# Conceptual Framework

Unique structure of MBS markets – Dealers provide liquidity:

- **Purchase** agency-MBS in **Specified Pool (SP)** mkt (cash/immediate settlement)
- **Sell** it in **To-Be-Announced (TBA)** mkt (forward/forward settlement)
- Same dealer intermediating in **SP** and **TBA** market (TRACE data)
  - alleviates concern dif. intermediaries w/ dif. risk premiums and inventory costs
- Insight: same dealers & same securities, set up arbitrage relationship

$$SP(t) = EV - \gamma(q,\tau) - f(q,\tau) - RP(q,\tau) \quad (1)$$

$$TBA(t) = EV - RP(q,\tau) \quad (2)$$

- TBA and SP eq. should allow dealers to arbitrage away risk premium, leaving only
  1. balance sheet constraint ($\gamma(q,\tau)$)
  2. funding cost ($f(q,\tau)$)

# Empirical Analysis: Dealer Trading Behavior

Map these costs to two metrics observed in market

"Payup" $\equiv SP(t) - TBA(t) = \gamma(q, \tau) + f(q, \tau)$

- Historically positive – the SP price $\uparrow$ than TBA price because of quality
  - Control for quality $\rightarrow$ close to zero and slightly positive
- **Negative w/ onset COVID-19** $\rightarrow$ increased inventory costs. Could come from:
  - balance sheet cost
  - funding cost
  - risk premiums

Risk premium ($RP(q, \tau)$) $\equiv$ OAS

- **Spiked up w/ onset COVID-19**

# Empirical Analysis: Effect of Fed Policies

Identify policy tool effect by partitioning timeline

Tool studied occurs at beginning of partition - argue first tool announced had largest effect

- COVID 3/9-3/12 $\rightarrow$ market wide flight to cash, $1.5 T repo funding begins 3/12
- FED1 3/16-3/18 $\rightarrow$ Fed TBA purchases clearing 1 month ahead
- FED2 3/19-3/27 $\rightarrow$ Fed t+3 & TBA purchases
- FED3 3/30-4/24 $\rightarrow$ TBA purchases, (SLR relaxed 4/1/20 - 3/31/21)

- Costs
  - $\gamma(q, \tau)$ - balance sheet cost
  - $f(q, \tau)$ - funding cost
  - $RP(q, \tau)$ - risk premium
- Fed tool used
  - TBA (3/16-), t+3 (3/19-3/30)
  - $1.5 trillion repo funding (3/12)
  - affected by all policies

What about Supplementary Leverage Ratio (SLR) being relaxed (4/1/20 - 3/31/21)?

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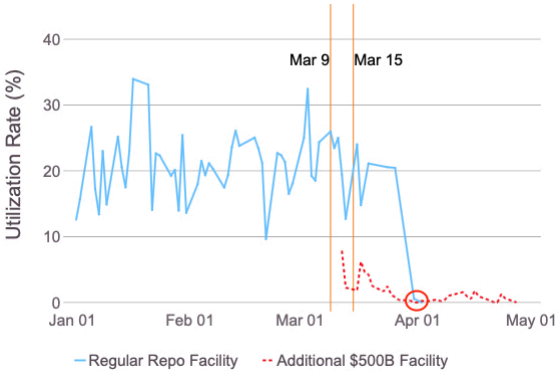
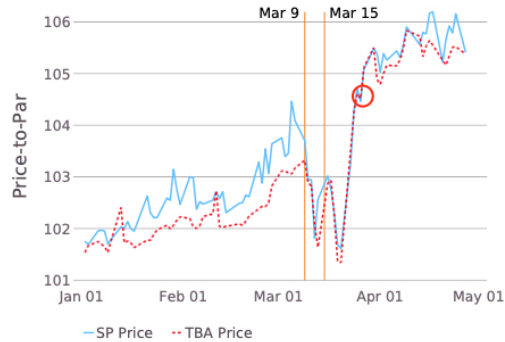
What about Supplementary Leverage Ratio (SLR) being relaxed (4/1/20 - 3/31/21)?

# Main Comment: Supplementary Leverage Ratio (SLR) Exemption of Treasuries and Reserve Bank Deposits

- FED2 (t+3) period alone: payup, OAS, and customer selling not fully stabilized
- 4/1 SLR exemptions →, price, OAS, customers' daily selling return to pre-COVID levels



# Main Comment: Supplementary Leverage Ratio (SLR) Exemption of Treasuries and Reserve Bank Deposits

$$SLR = \frac{\text{Equity Capital}}{\text{Total Assets}} \tag{3}$$

Exemption $\downarrow$ denominator $\rightarrow$ banks expand balance sheets

- JP Morgan: "Banks will likely use the relief to buy more Treasuries and agency mortgage-backed securities and sell them into the Fed's quantitative easing program."[1]
- Authors argue that low repo utilization $\Rightarrow$ funding costs not binding
  - 4/1 drop in utilization suggests repo used to temporarily lower dealer leverage ratio (Adrian, Shin 2011)
    - No longer necessary after SLR relaxed

$\rightarrow$ Test reversals in payup and OAS when SLR exemption policy removed 3/31/21

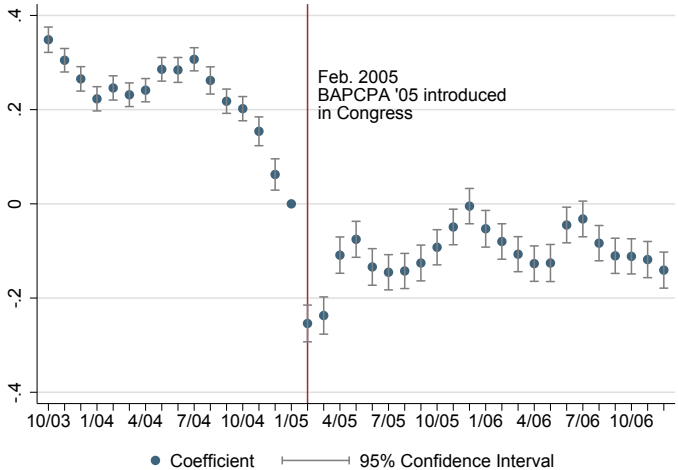
[1] https://am.jpmorgan.com/sg/en/asset-management/liq/insights/liquidity-insights/updates/a-federal-reserve-announcement-provides-temporary-relief-to-banks-on-leverage-and-capital-adequacy/

# Additional Comments

- Was it t+3 or volume of total TBA purchases in FED2 that had largest effect?
  - Differentiate volume effect from $t + 3$ vs TBA:
  - Agency-MBS yields relative to corporate bond yields at TBA vs t+3 announcement
    - Spread - BAPCPA announcement
      - Largest drop relative in MBS yield would indicate which policy the market thought would be more effective at alleviating dealers' costs
- Funding costs - low repo utilization may not fully capture funding costs
  - Rehypothecation - if TBA and t+3 policies ↑ dealers' ability to rehypothecate MBS, would enable them to get funding more easily from each other
    - Without studying this effect, the analysis may underestimate the role of funding costs in driving dislocations in payup
    - Test proxy for rehypoethecation – FR2004 securities out minus securities in for agency-MBS relative to corporate securities and/or Treasuries (Infante 2019, Lewis 2021)

# Appendix

# OAS Private-Label MBS v. Agency-MBS Pre/Post BAPCPA 2005




(Figure taken from Lewis 2021)

▸ Additional Comments

# Appendix - Variables

$V_{i,t}^{SP}$ inventory change (Specified Pool)
$V_{i,t}^{TBA}$ inventory change (TBA)
$Q_{i,t}$ Customer's gross selling amount to dealers (SP trades that fall under a given TBA cohort $i$ and day $t$) they cluster at the cohort level, does that make sense?
$F_{i,t}^{TBA}$ Fed's TBA purchase amounts
$F_{i,t}^{t+3}$ Fed's $t+3$ purchase amounts