

Discussion of

# How the LSAPs Influence MBS Yields and Mortgage Rates?

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# Overview

- How does quantitative easing (QE) work?
- Three possible mechanisms:
  - Signaling: Commits the Fed to low rates for a long time → Expectations hypothesis lower LT yields
  - Portfolio Balance: Demand curves are downward sloping, less Q → higher prices (i.e., lower risk premia)
  - Recruitment Channel: Low rates = reaching for yield → increased demand for risky assets and lower risk premia
    - Can amplify both the signaling and portfolio balance channels.
- Isolating independent effects of QE is important for policy.
  - If there is no effect on risk premia, forward guidance is enough.
  - QE may also carry some costs in terms of financial stability/market functioning.

## Paper's Approach

- Most previous work uses event studies.
- The authors run regressions like

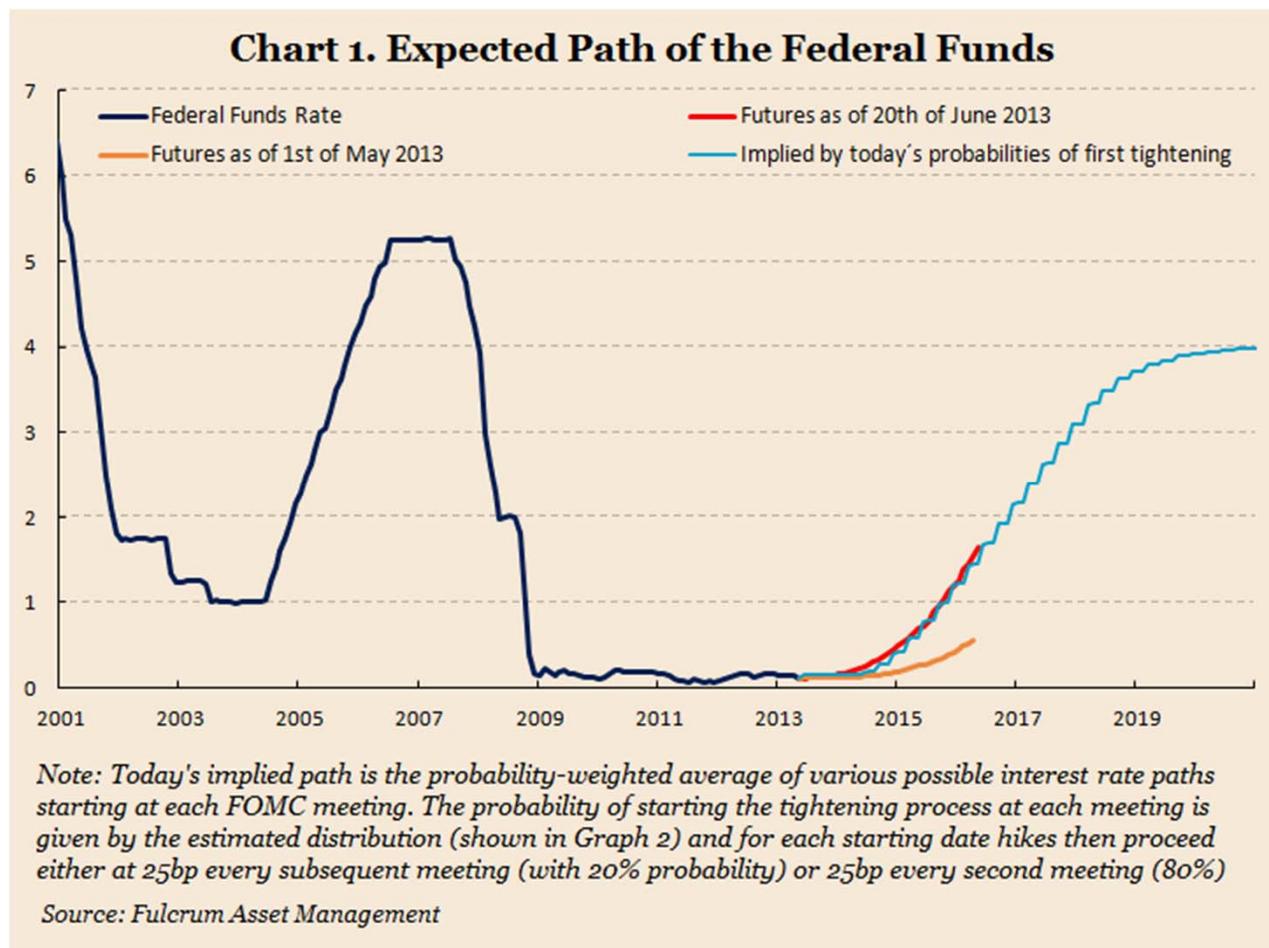
$$MBSYield_t = \alpha + \beta_1 \cdot Swap_t + \beta_2 \cdot YieldSpread_t + \beta_3 \cdot FedShare_t + \varepsilon_t$$

- Assign any variation in MBS Yields that can be ascribed to the swap yield or the yield spread as signaling.
- Interpret a negative coefficient on *FedShare* as evidence of the portfolio balance channel.
- Find evidence consistent with an economically meaningful portfolio balance channel.
  - Treasury purchases have reduced MBS yields by 76 bps.
  - MBS purchases have reduced yields by 73 bps.
  - Results are stronger in levels than differences.

## Portfolio Balance and Market Segmentation

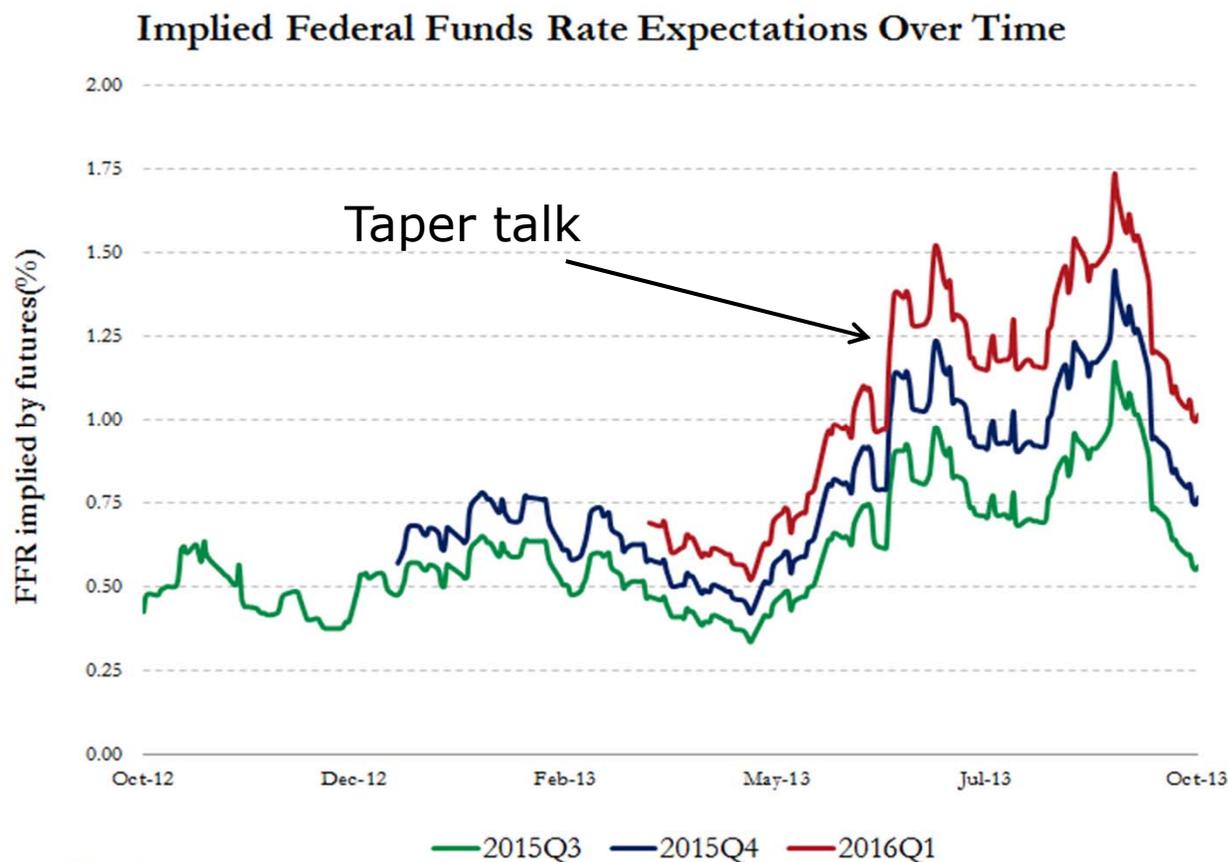
- The LSAPs are large-scale relative to the historical size of the Fed balance sheet.
  - \$3.2 trillion of Treasuries and Agencies in portfolio as of 2013Q2.
- But they are small relative to the total quantity of risk in credit markets.
  - According to the Flow of Funds, there were approximately \$37 trillion of debt securities outstanding in 2013Q2.
  - And another \$30 trillion of corporate equity.
- So segmented markets are likely an important part of any story where the portfolio balance channel has an impact.
  - But complete segmentation means that Treasury purchases won't affect MBS yields.
  - Need partial segmentation, which is not unreasonable.

# Signaling



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## Empirical Approach

- A simple formulation of MBS yields:

$$MBSYield_t = Swap_t + MBSSpecific_t$$

- Break  $MBSSpecific_t$  into cost of prepayment option and residual (including liquidity).

$$MBSSpecific_t = OptionCost_t + \varepsilon_t$$

- No obvious channel for signaling to affect liquidity.
  - May affect option cost, but option is struck at-the-money so rate volatility should be particularly important.
- Portfolio balance can affect both pieces.
  - Can increase or decrease liquidity premium.
  - May reduce option premium.
- For MBS specific components, important that the Fed purchase MBS as opposed to Treasuries.

## Empirical Approach

- Break  $Swap_t$  into expectations hypothesis piece and term premium piece.

$$Swap_t = E[ShortRate_{t \rightarrow T}] + TermPremium_t$$

- Signaling affects expectations hypothesis piece.
  - Portfolio balance affects term premium piece.
  - Recruitment channel links the two pieces.
- If Treasury and MBS markets are integrated, purchasing either MBS or Treasuries should affect term premium.
  - Basic empirical approach is to count all variation in  $MBSYield_t$  that can be ascribed to  $Swap_t$  as signaling.
    - This is conservative:  $Swap_t$  contains term premium, which portfolio balance may reduce if markets are integrated.
    - Feldhutter and Lando (2008) show MBS market affects swap rates.

## Empirical Approach

- Why do Treasury purchases have a larger effect than MBS purchases?
  - In my formulation, need partial segmentation between Treasury/MBS/swap markets to have any effect at all.
- Should the coefficient on the swap yield be constrained to be 1?
  - Obtain coefficients very close to 1 if you use Bloomberg data.
  - But this may be model driven.
- Could the denominator of *FedShare* be driving things?
  - Purchases are very predictable.
  - *FedShare* is relatively low when MBS issuance is high → typical downward sloping demand story says that MBS yields should be high.
  - This is not inconsistent with portfolio balance.

## Portfolio Balance vs. Slow-Moving Capital

- We think that market segmentation is not permanent.
  - Capital may move slowly, but it moves eventually.
  - In fact, transmission to corporate debt markets may require portfolio rebalancing away from MBS/Treasuries.
- This suggests that portfolio balance effects may weaken over time.
  - Event studies may be overstating long-term effects of QE announcements.

- The authors could look at this with their empirical setup.

$$\begin{aligned} MBSYield_t = & \alpha + \beta_1 \cdot Swap_t + \beta_2 \cdot YieldSpread_t + \beta_3 \cdot FedShare_t \\ & + \beta_4 \cdot T_t + \beta_5 \cdot FedShare_t \times T_t + \varepsilon_t \end{aligned}$$

where  $T_t$  is the time since the last QE announcement.

## Transmission to Mortgage Rates

- We are ultimately interested in rates available to borrowers, not prices in secondary markets.
- In mortgage markets, originators (banks) are an important layer of intermediation between borrowers and markets.
- Some evidence that market power in this layer affects transmission to borrowers (Scharfstein and Sunderam, 2013).

- Authors look at this, running

$$MortgageRate_t = \alpha + \beta_1 \cdot MBSYield_t + \beta_2 \cdot Capacity_t + \varepsilon_t$$

where *Capacity* is the ratio of refinancings to employees.

- Don't find much evidence that capacity matters.

## What is the Null? A Simple Model

- Think of MBS yield  $r$  as an input cost for mortgage originators.
- Capacity utilization as measured will be highly correlated with quantities.
  - So the specification is a bit like running prices on quantities and costs.
- What would this yield in a simple Cournot competition model with  $N$  firms competing?
- Suppose demand is given by  $P(Q) = \varepsilon_D - bQ$ .
- Firms solve  $\max_q P(Q)q - rq$
- Assume  $\varepsilon_D$  and  $r$  are stochastic and independent with standard deviations  $\sigma_D$  and  $\sigma_r$  respectively.

## What is the Null? A Simple Model

- In the symmetric equilibrium we have

$$Q^* = \frac{\varepsilon_D - r}{b} \frac{N}{N+1}, \quad P^* = \frac{\varepsilon_D + rN}{N+1}$$

- Competition/capacity  $N$  affects transmission of MBS yields into prices and sensitivity of quantities to MBS yields:

$$\frac{\partial P^*}{\partial r} = \frac{N}{N+1}, \quad \frac{\partial Q^*}{\partial r} = -\frac{1}{b} \frac{N}{N+1}$$

- Regressing  $P^*$  on  $r$  and  $Q^*$  yields

$$\begin{aligned} \hat{\beta} &= \begin{bmatrix} \sigma_r^2 & Cov(Q^*, r) \\ Cov(Q^*, r) & Var(Q^*) \end{bmatrix}^{-1} \begin{bmatrix} Cov(P^*, r) \\ Cov(Q^*, r) \end{bmatrix} \\ &= \begin{bmatrix} 1 \\ b \frac{N+1}{N} \end{bmatrix} \end{aligned}$$

## A Different Take on Pass-through

$$\Delta Rate_{i,t} = \alpha + \beta_1 \cdot \Delta MBS Yield_t + \beta_2 \cdot Top\ 4_{i,t-1} + \beta_3 \cdot \Delta MBS Yield_t \times Top\ 4_{i,t-1} + \varepsilon_{i,t}$$

$\Delta MBS Yield_t$	0.679 [7.90]	0.655 [7.28]	
$\Delta MBS Yield_t \times Top4_{t-1}$	<b>-0.626</b> <b>[-2.77]</b>	<b>-0.564</b> <b>[-2.39]</b>	
$(\Delta MBS Yield)^+$			0.601 [3.90]
$(\Delta MBS Yield)^-$			0.75 [3.84]
$(\Delta MBS Yield)^+ \times Top4_{t-1}$			-0.312 [-0.74]
$(\Delta MBS Yield)^- \times Top4_{t-1}$			<b>-0.916</b> <b>[-1.78]</b>
$Top\ 4_{t-1}$	-0.057 [-0.94]	-0.001 [-0.04]	-0.142 [-1.05]
R <sup>2</sup>	0.318	0.317	0.314
N	38068	38068	38068
County FE	N	Y	Y
Year FE	N	Y	Y

## Minor Comments

- Newey-West standard errors for regressions in levels.
  - Reduces the t-statistics quite a bit in my data, though everything is still significant.
- GSE holdings of MBS.
  - Whether you want to count these as held by the private market or not depends on how much the GSEs are hedging the interest rate/prepayment risk.
  - I was under the impression they are doing a lot of hedging and so the private market is bearing that risk.
- Interest rate volatility
  - Seems natural this should affect MBS yields. Add controls?
- Data definitions

# Conclusion

- Very interesting paper on an important subject.
- Encourage the authors to flesh out the discussion of the components of the MBS yield that QE is operating on.
- Thanks!