The Effects of Quantitative Easing on Interest Rates

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Objective

• Weight of evidence that QE can/does affect interest rates

• Question: What are the **channels** through which QE affect bond market interest rates?

• Understanding channels is important to:
  – Evaluate the effectiveness of a given QE policy
  – Conditions when policy may or may not work
Main Results

1. Treasuries-only QE has most significant effects on yields of near-zero-default risk assets
   – Treasuries, Agencies, Aaa bonds
   – Little effect on Baa, Mortgage yields which may be more policy relevant
   – Effects through clientele-demand for “safe” assets

2. MBS in QE1 (but not QE2) affects prepayment risk premia and thereby lowers MBS rates
   – Segmented market effects
Outline

1. Channels we evaluate
   - There is more in the paper than I have time to cover in 20 mins (I skip inflation, credit risk, uncertainty)

2. Evidence from QE1 event study
   - Relative to literature: We add intraday evidence, as well as a host of other bond market data, including derivatives

3. Evidence from QE2 event study
   - New in the literature
Duration risk channel

• QE has government buying duration from private sector
  → Reduces market price of duration risk

\textit{Requires assumption of market segmentation, as in Vayanos-Vila (2010)}

• Prediction:
  – QE decreases yields on all long-term nominal assets.
  – QE effects larger for longer duration assets.
Liquidity Channel

• QE increases supply of liquid assets
  → decreases liquidity price premium
  → increases yields on liquid assets

• Prediction:
  – QE raises Treasury rates, rather than lowers them.
  – Large effect for liquid assets. No effect for illiquid assets.
Krishnamurthy-Vissing-Jorgensen (2010): Existence of a clientele-demand for “safe” assets

CCAPM Value: Price = E[M * Risky Payoff]
Safety Channel

• QE decreases supply of long-term safe assets
  → lowers yields on long-term safe assets.

  *Clientele-demand for safe assets, as in Krishnamurthy-Vissing Jorgensen (2010)*

• Prediction:
  – QE effects larger for safest assets.
  – Small/no effects on Baa bonds.
Prepayment Risk Channel

• QE1 MBS: Increase in intermediation capital; more risk capacity for bearing prepayment risk
  → Reduces MBS yields in particular

*Requires segmentation in the MBS market, as in Gabaix, Krishnamurthy, Vigneron (2007)*

• Predictions:
  – QE1 lowers MBS yields relative to other bond market yields.
  – QE2, which does not involve MBS purchases, does not affect MBS yields.
Event Study for QE1

- Use 5 main event dates from Gagnon, Raskin, Remache and Sack (2010) – all are announcement dates.
  - 11/25/08: Announcement of $100bn Agency debt and $500bn in Agency MBS
  - 3/18/09: Up to $300bn in Treasuries, $200bn Agencies, $1.25 tn Agency MBS
  - Others, indicating intent to purchase, but less clear on amounts
Causality: 10-year Treasury 3/18/2009

Yield

Volume
<table>
<thead>
<tr>
<th>Treasuries yields (constant maturity)</th>
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<td>30 year</td>
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<td>Aaa long</td>
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<td>-77</td>
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<td>-83</td>
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Corporate yield-CDS is a better benchmark: No duration effect is evident here.
Liquidity: Treasuries fall less than Agencies (Reduction in Liquidity Premium)

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Corporate Yields-Credit Default Swaps

|                  | -83      | -78     | -83     | -31      | 21      | 15     | -94     | -88    | -82  | -26     | -1     | -72  |
### Treasuries yields (constant maturity)

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### Agency yields

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**Safety:** Assets with low-default-risk fall the most in yield
## MBS: Fall in prepayment risk-premia (segmented mkt effects)

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### Corporate Yields-Credit Default Swaps

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**Note:** The table above represents the fall in prepayment risk-premia for MBS, segmented by market effects. The figures indicate the percentage changes in yields for different maturity periods.
QE2 Event Study

• 8/10/2010 FOMC:
  “the Committee will keep constant the Federal Reserve's holdings of securities at their current level by reinvesting principal payments from agency debt and agency mortgage-backed securities in longer-term Treasury securities.”
  ❑ 20% repayment rate on $1.1tn = $220bn

• 9/21/2010 FOMC: Similar

• Intent to purchase a further $600bn
  ❑ Hard to pin down event date.
Much smaller changes in MBS yields, indicating **QE1** effect was through prepayment risk channel.
• **Liquidity Channel**: Small effect, but note that liquidity premia are tiny in late 2010 (unlike 2008-2009 period)

• **Safety Channel**: Agencies, Treasuries, Inv Grade fall the most; High Yield does not fall
Summary

• Largest effects of QE on safest assets
  – Clientele demands for safety; QE reduced the supply of safe assets
  – But, safe-asset yields may be less policy relevant

• Liquidity effect in QE1; not much in QE2

• Prepayment risk effect in QE1 purchase of MBS
Demand Conditions

• Event study suggests larger effects in QE1 period than QE2 period
  – “Flight to quality” (safety channel) during crisis

• Regression evidence based on our past work on Treasury supply and bond market rates
  – QE2 predicted effects: 7 to 21 basis points
Conclusion

• It is important to look at a variety of asset market data to assess the effects of QE
  – Derivatives data useful for macro-policy evaluation
  – Can reach inappropriate conclusions by only focusing on Treasuries

• Effects of QE depend on which asset is purchased
  – MBS versus Treasuries
Inflation Expectations

- QE1 increases inflation expectations
  - 10 yr inflation swaps up 95 bps
  - CDS-adjusted corporate yield minus TIPS, up 156 bps

- QE2:
  - Inflations swaps: up 5 bps
  - Corp-CDS-TIPS: up 36 bps