

# 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

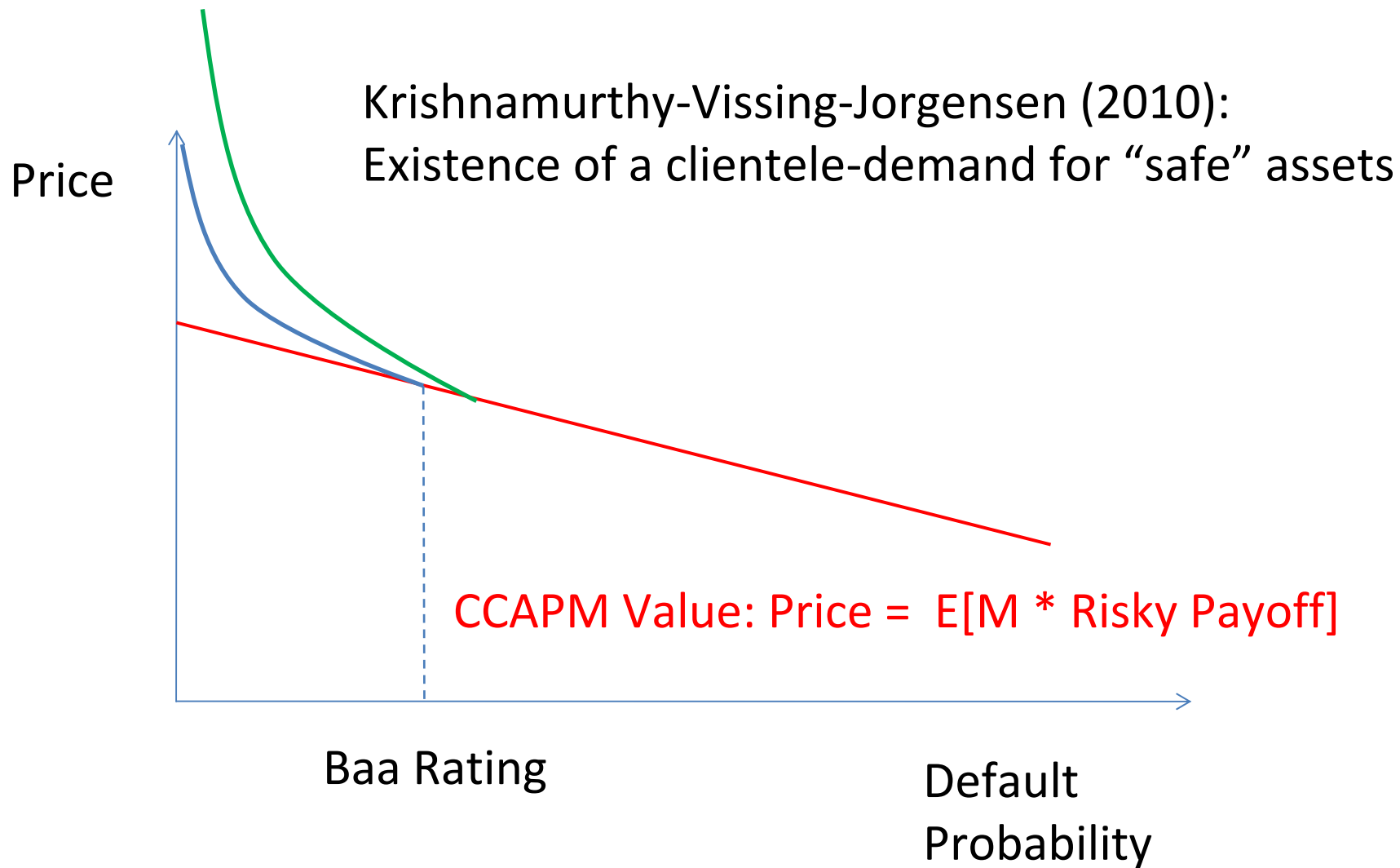
# Duration risk channel

- QE has government buying duration from private sector
  - Reduces market price of duration risk
    - 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.

# Safety Channel



# 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

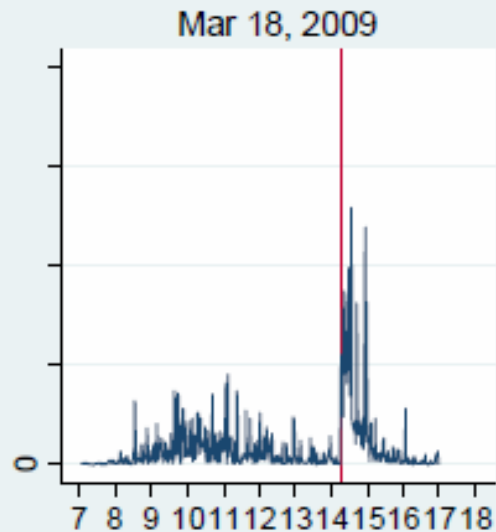
- Use 5 main event dates from Gagnon, Raskin, Remache and Sack (2010) – all are announcement dates.
  - 11/25/08: Announcement of \$100bn Agency debt and \$500bn in Agency MBS
  - 3/18/09: Up to \$300bn in Treasuries, \$200bn Agencies, \$1.25 tn Agency MBS
  - Others, indicating intent to purchase, but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

# Causality: 10-year Treasury 3/18/2009

Yield



Volume



Treasuries yields (constant maturity)				Agency yields			Agency MBS yields	
30 year	10 year	5 year	1 year	10 year	5 year	3 year	30 year	15 year
-73	-107	-74	-25	-199	-150	-120	-128	-98

<u>Corporate Yields</u>											
Aaa long	Aa long	A long	Baa long	Ba long	B long	Aaa int	Aa int	A int	Baa int	Ba int	B int
-77	-83	-93	-81	-60	-43	-88	-93	-92	-76	-82	-130
<u>Corporate Yields-Credit Default Swaps</u>											
-83	-78	-83	-31	21	15	-94	-88	-82	-26	-1	-72

**Treasuries, Agencies, Agency MBS also affected by liquidity/safety/prepayment-risk**

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**Corporate yield-CDS is a better benchmark: No duration effect is evident here**

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**Liquidity: Treasuries fall less than Agencies (Reduction in Liquidity Premium)**

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**Safety: Assets with low-default-risk fall the most in yield**

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**MBS: Fall in prepayment risk-premia (segmented mkt effects)**



# 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.

Treasuries yields (constant maturity)				Agency yields		Agency MBS yields	
30 year	10 year	5 year	1 year	10 year	5 year	30 year	15 year
-9	-18	-17	-1	-18	-18	-6	-4

**Much smaller changes in MBS yields, indicating QE1 effect was through prepayment risk channel.**

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Corporate yields-CDS			
Inv grade long	Inv grade inter- mediate	High yield long	High yield inter- mediate
-7	-12	11	21

- **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:
  - Inflation swaps: up 5bps
  - Corp-CDS-TIPS: up 36 bps