

# **Measuring the Effect of the Zero Lower Bound on Medium- and Longer-Term Interest Rates**

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Discussion by Jonathan Wright

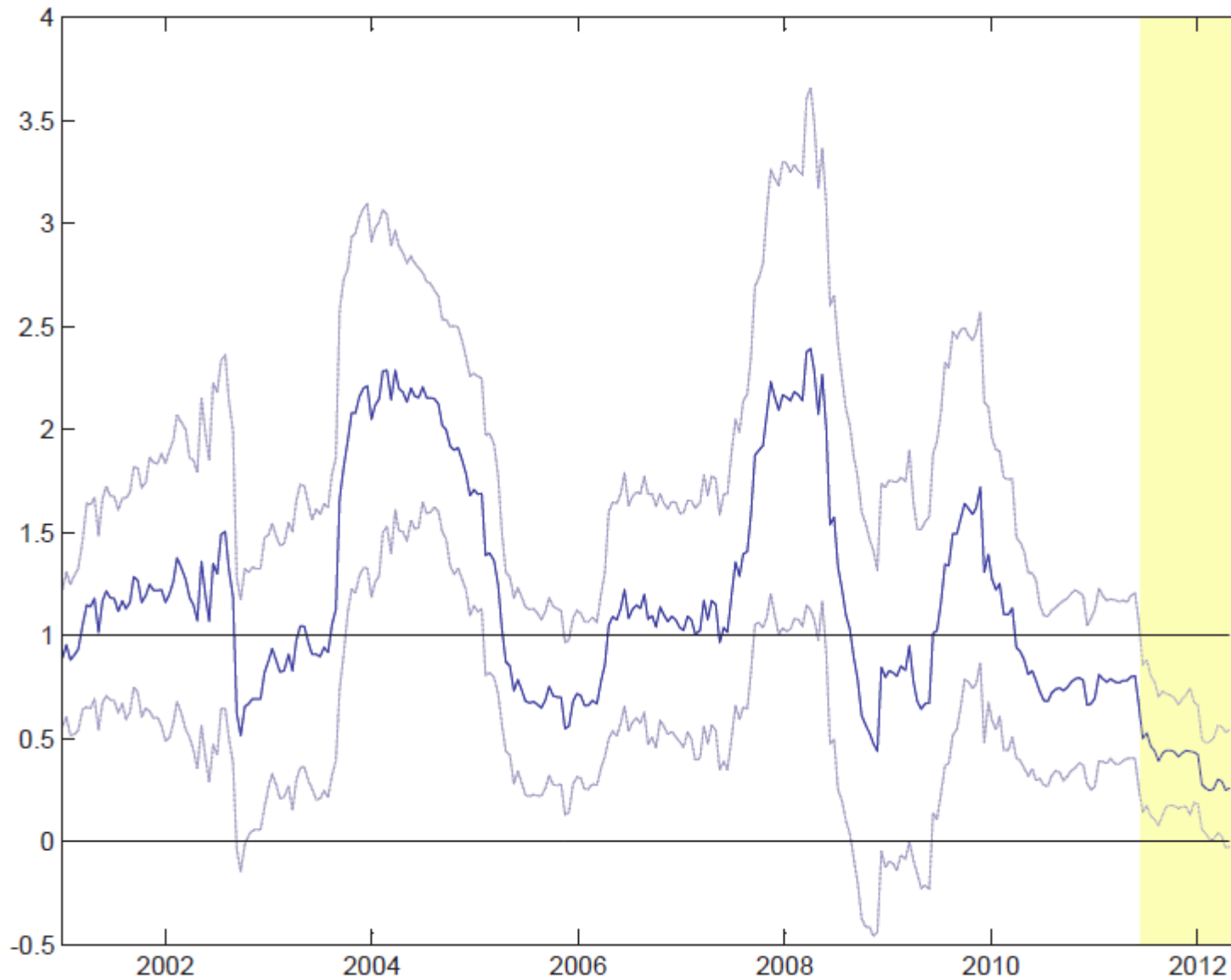
# The paper

- Measures how far out the term structure the zero bound goes
- Identifies this by diminished sensitivity to macro news announcements
- Very clever
- How else can we measure ZLB impact?

# Setup

- $y_n = E^Q \left( \frac{1}{n} \int_0^n r(s) ds \right)$
- $y(n) = E^Q \left( \frac{1}{n} \int_0^n \max(r^*(s), 0) ds \right)$
- ZLB implies diminished sensitivity to macro news
- Options give the whole pdf

# Sensitivity of ED4 to macro news



# Options-implied pdfs

- With no measurement error, options give pdfs **every day with zero standard error!**

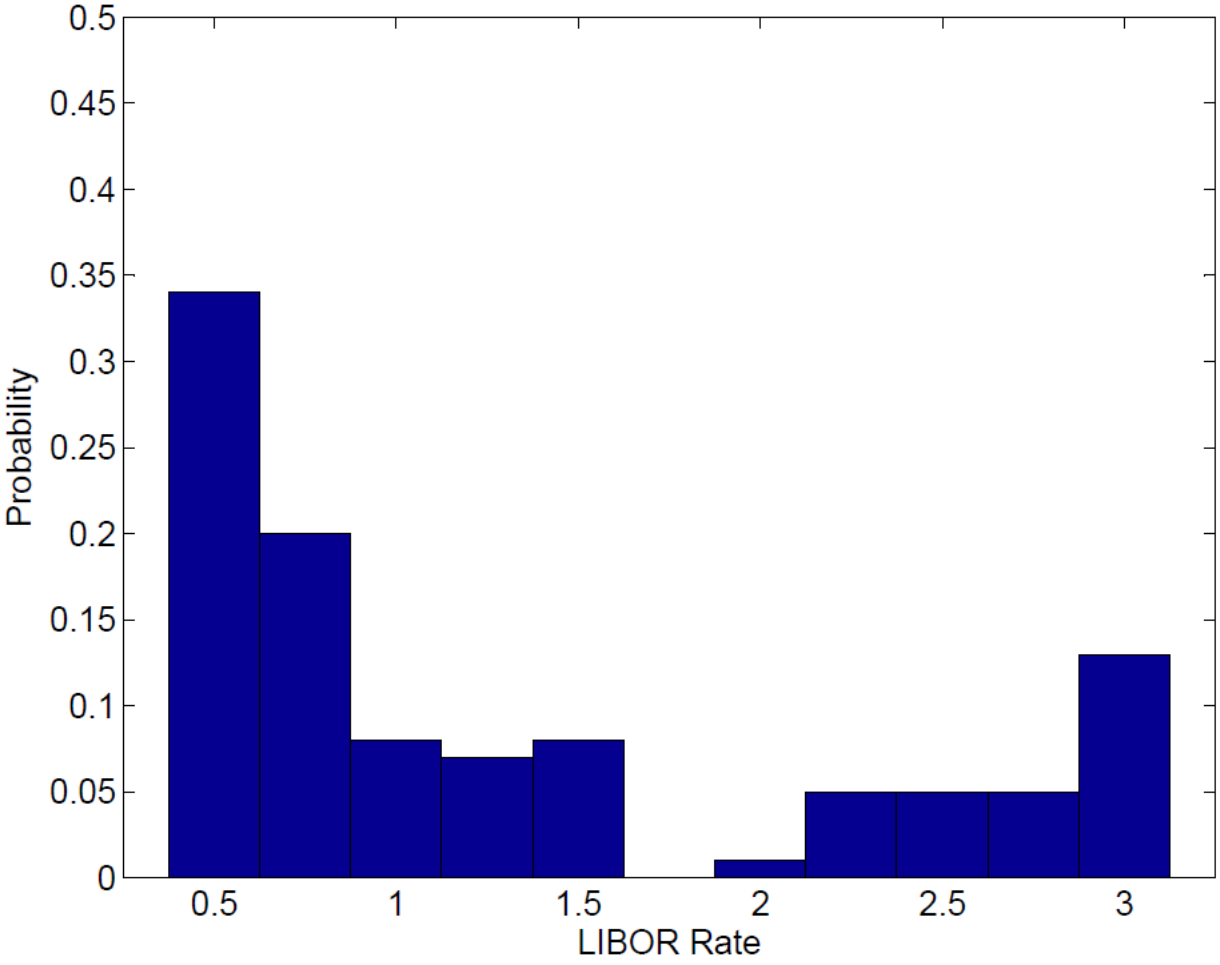
# Ps and Qs

- Everything is under the risk-neutral measure
  - Except that surveys are under P

# Forward Guidance

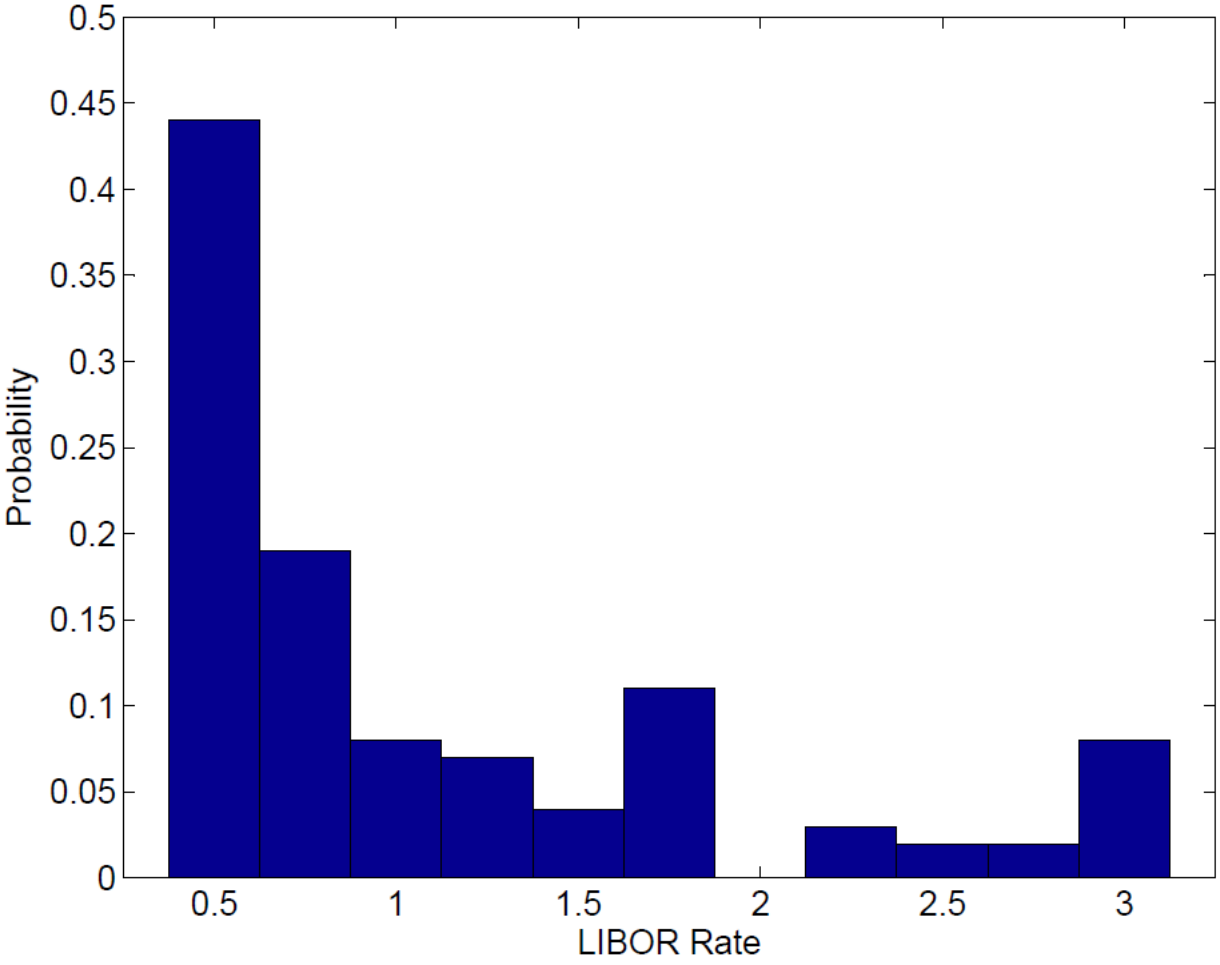
- Want to measure effect of forward guidance
- Can be tackled with the SW methodology
  - Doesn't pin down effect of specific announcement

# PDF for Dec 2014: Jan 24 2012





# PDF for Dec 2014: Jan 26 2012



# Black “shadow rate” model

- Natural way of measuring effect of ZLB
- $r(t) = \max(r^*(t), 0)$
- Options could give estimates of the shadow rate
  - Kim and Singleton (2011)

# Types of forward guidance

- 1. FOMC forecast of weak economy.
- 2a. Commitment to keep rates low longer than will be desirable *ex post*.
- 2b. Commitment to new reaction function.
- Effect of economic news on shadow rate or upper %tile of options-implied pdf might help

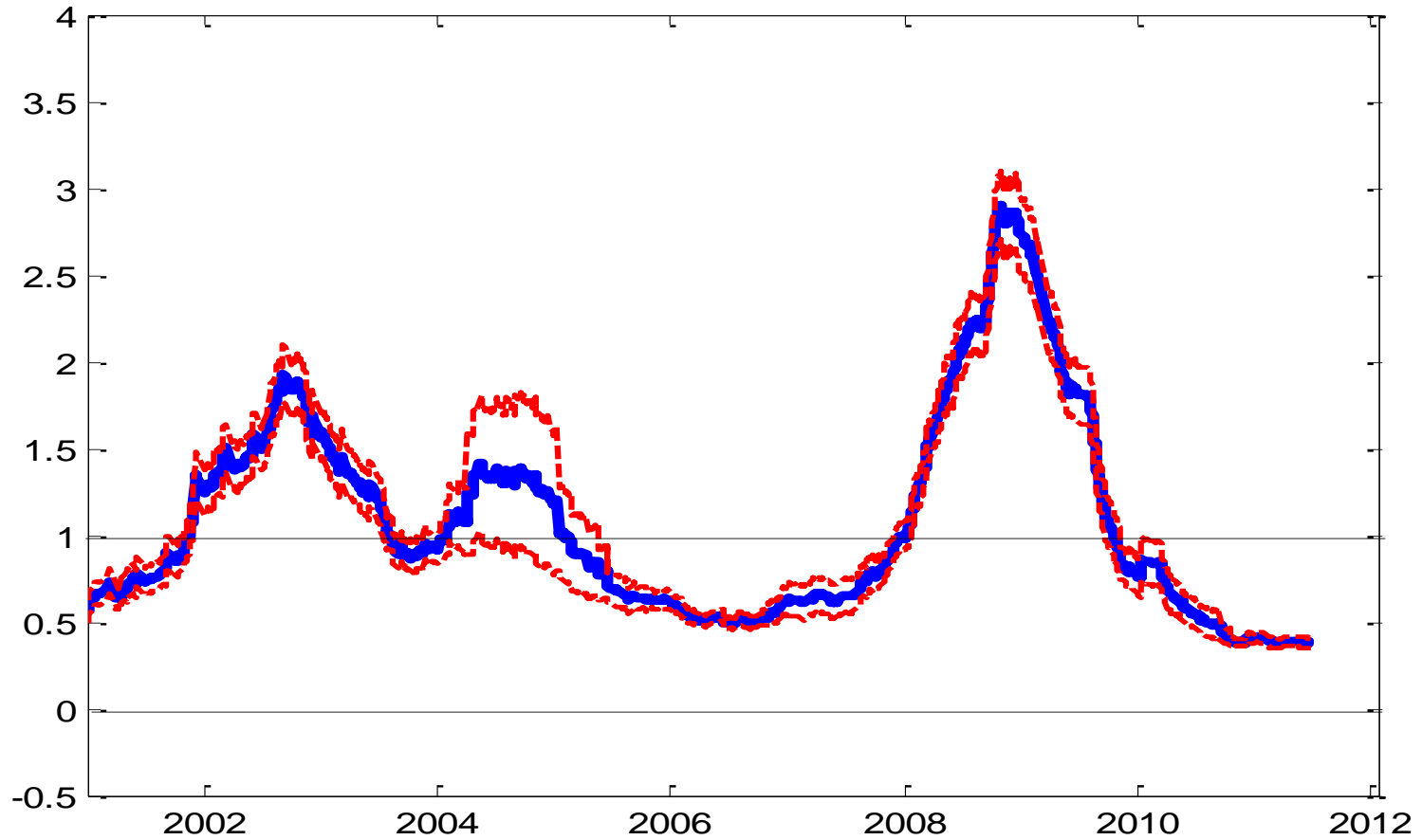
# Another way of measuring ZLB impact

- SW: Is the volatility of the term structure of interest rates in response to macro news different now from normal times?

# Another way of measuring ZLB impact

- Alt: Is the volatility of the term structure of interest rates ~~in response to macro news~~ different now from normal times?

# Realized volatility of ED4



# Yet another way of measuring ZLB impact

- As in SW but using intraday data

# Conclusions

- Paper is very important in event study literature
- Options give us measurement-error free risk neutral pdfs at all horizons