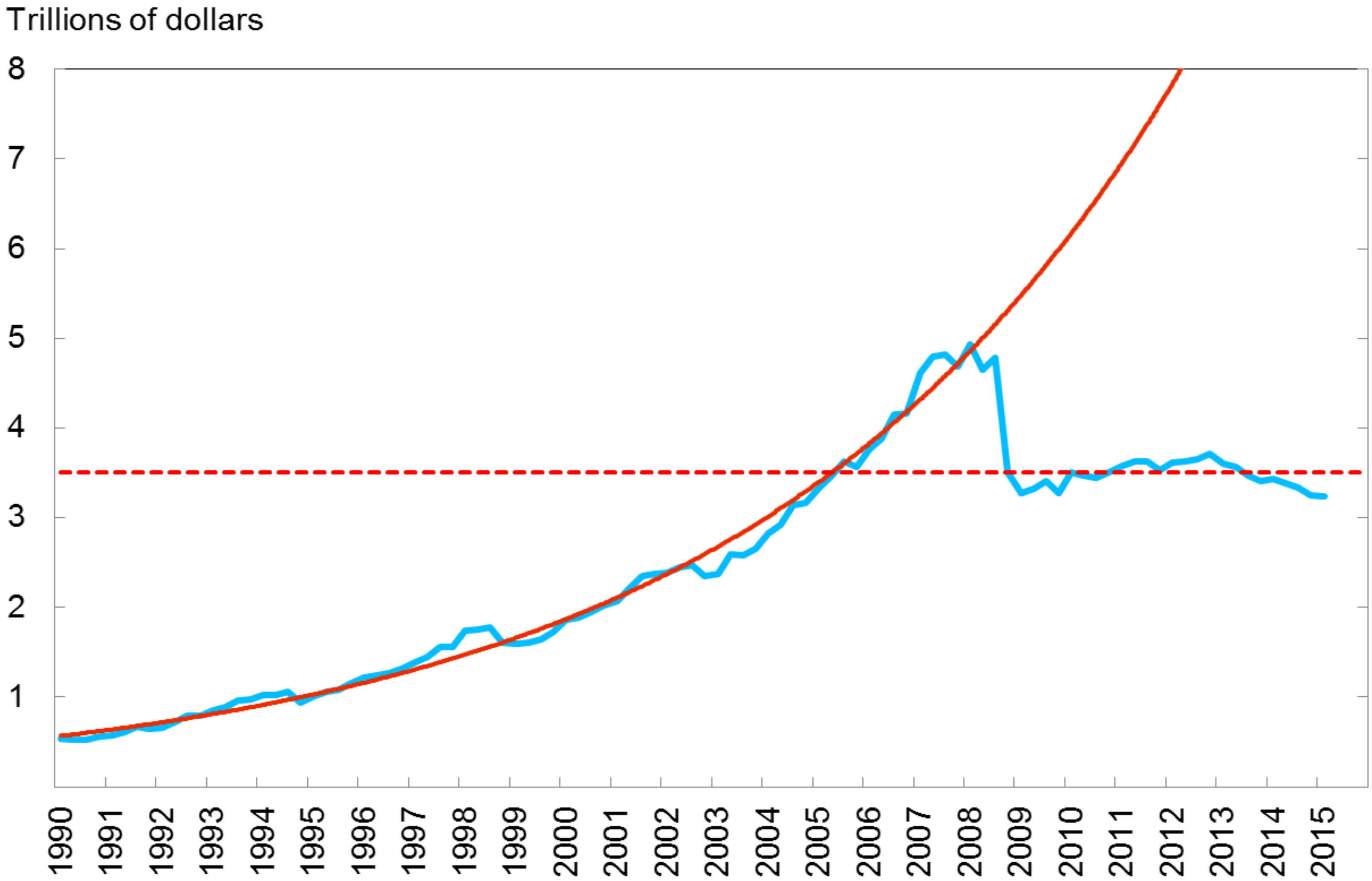
Dealer Assets Have Stagnated since the Crisis



Source: Board of Governors of the Federal Reserve, Financial Accounts of the United States.
Note: The chart plots total financial assets of securities brokers and dealers at the subsidiary level. The solid red curve shows the exponential growth trend, computed over 1990-2008; the dashed line is set at $3.5 trillion.

Questions to the Panelists

1. Has the contraction of dealer balance sheets caused a decline in market liquidity?

2. Has the system become less resilient to shocks?

3. How does the stance of monetary policy impact market liquidity conditions?

Panelists

- Michael Fleming, Vice President, FRBNY
- Charles Jones, Professor, Columbia University
- Torsten Slok, Managing Director, Deutsche Bank

Has Liquidity Changed in the U.S. Treasury Market?

Panel Discussion

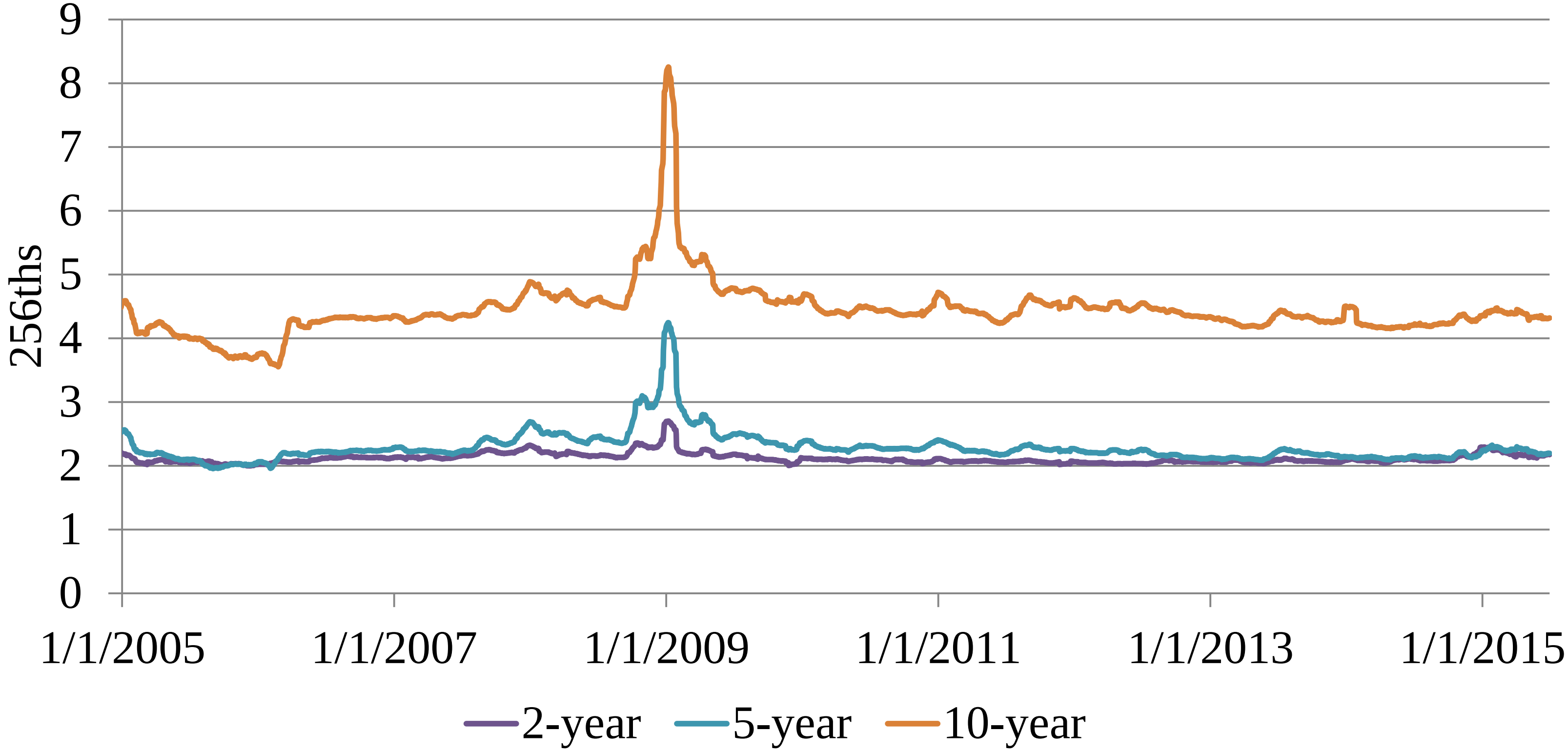
Michael Fleming
Federal Reserve Bank of New York

October 20, 2015

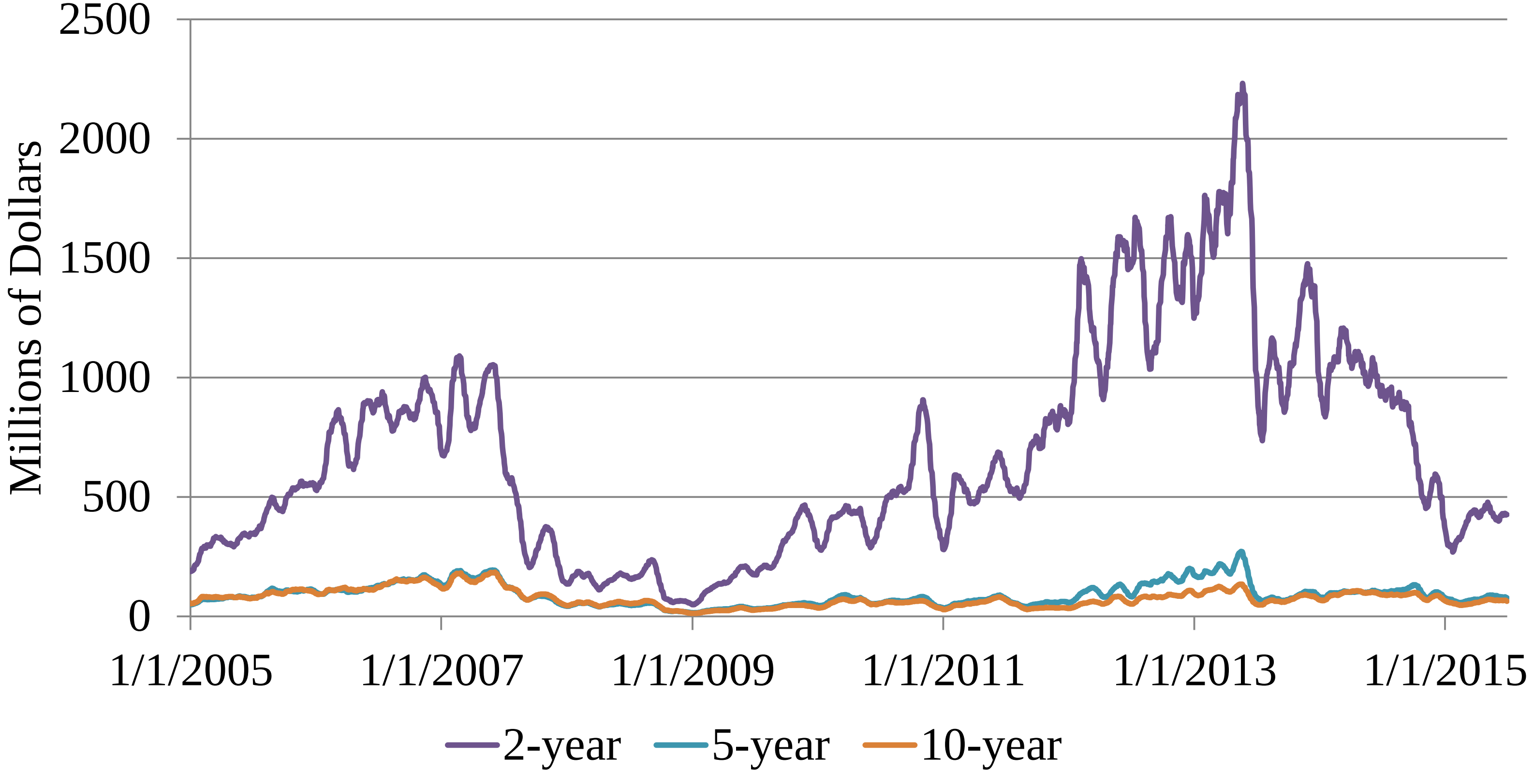
Reasons to Think Liquidity May Have Changed

- Dealers’ reduced balance sheets and risk taking
    - Aftermath of crisis, regulatory changes, changes in market structure
- Technological changes and entrance of new participants
- Growth in market and changes in liquidity demand
- Monetary policy environment

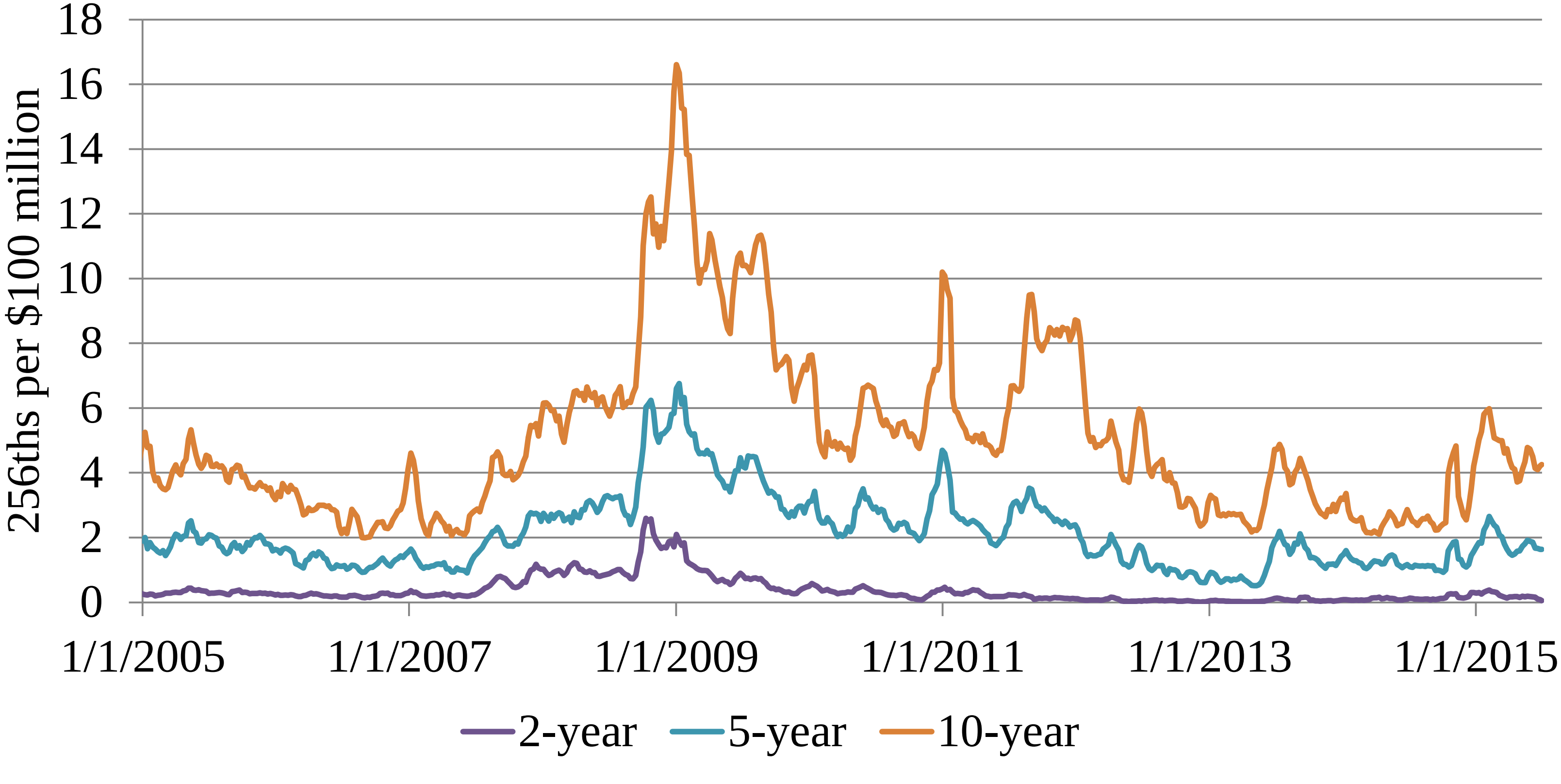
Bid-Ask Spreads Are Narrow and Stable



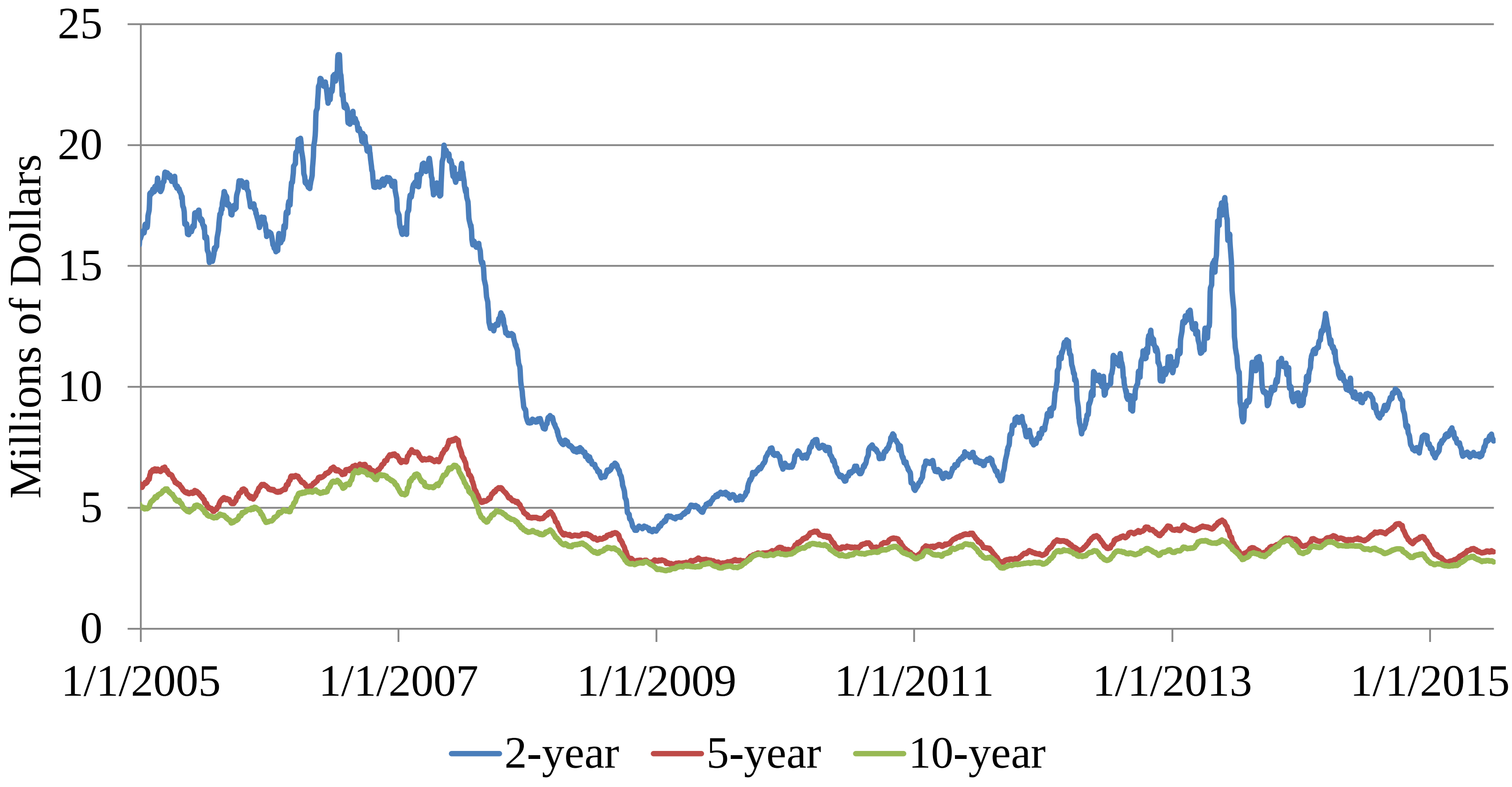
Depth Has Declined from Recent Highs



Price Impact of Trades Has Recently Risen



Trade Size Has Declined Over Time



Is Liquidity as Good as Evidence Implies?

- Misinterpreting evidence and/or looking at wrong measures
- Evidence is for interdealer market, not dealer-customer market
- Evidence is for on-the-run securities, not off-the-runs
  - Little recent evidence of liquidity bifurcation
- Concerns really about liquidity risk (not average liquidity)
  - Some evidence of this increasing for Treasuries (and equities)
- Concerns about future liquidity – when policy normalizes

Measuring liquidity in treasuries

Charles M. Jones
Robert W. Lear Professor of Finance and Economics
Columbia Business School
October 2015

1. Volatility and info drive liquidity

- In every asset market, illiquidity is highly correlated with the volatility of fundamentals.
  - Theoretically (e.g., Kyle 1985 and literally dozens more)
  - Empirically

- Rates volatility is appropriately higher at this inflection point, ergo so is illiquidity.

- Liquidity also depends (negatively) on the degree of information-based trading in a market.

- Possible that participants are collecting more valuable information about macroeconomic conditions.

2. New liquidity measures needed

In a world with order-splitting, large traders need to worry about:

- Bid-ask spreads
- Price impacts (permanent and temporary)
- Order anticipation strategies of others

In such a market, use **implementation shortfall** or **slippage** to measure trading costs (and thus liquidity) for large traders.

Equity markets have been through this transformation. Bid-ask spreads and slippage can tell a different story.

A slippage example

At 9:00am:

- Quote midpoint is 100.
- $50mm order to buy T-bonds released to the trading desk.

Order executes in five pieces:

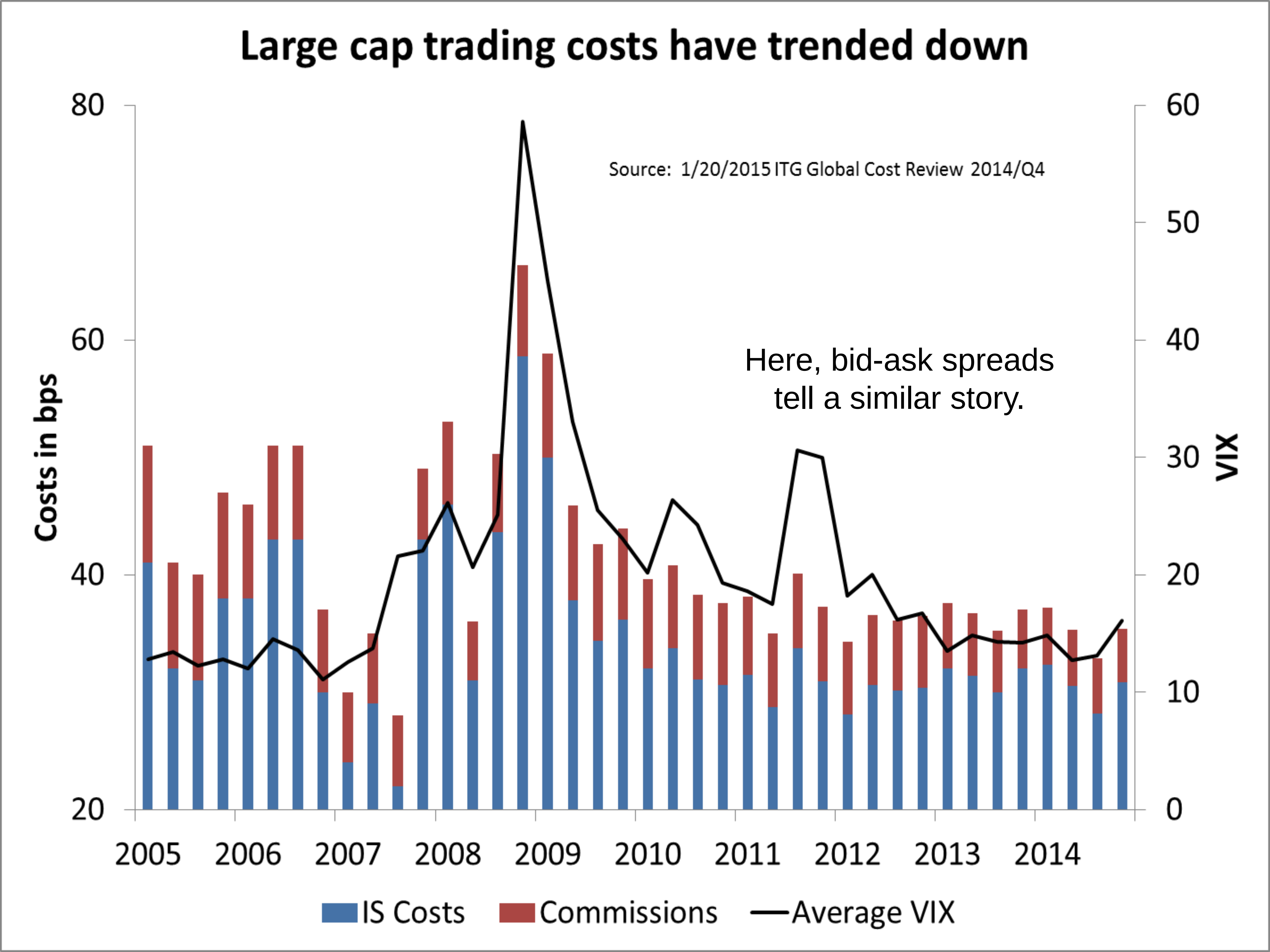
9:01am: $10 mm at 100-1/32

9:05am: $10 mm at 100-3/32

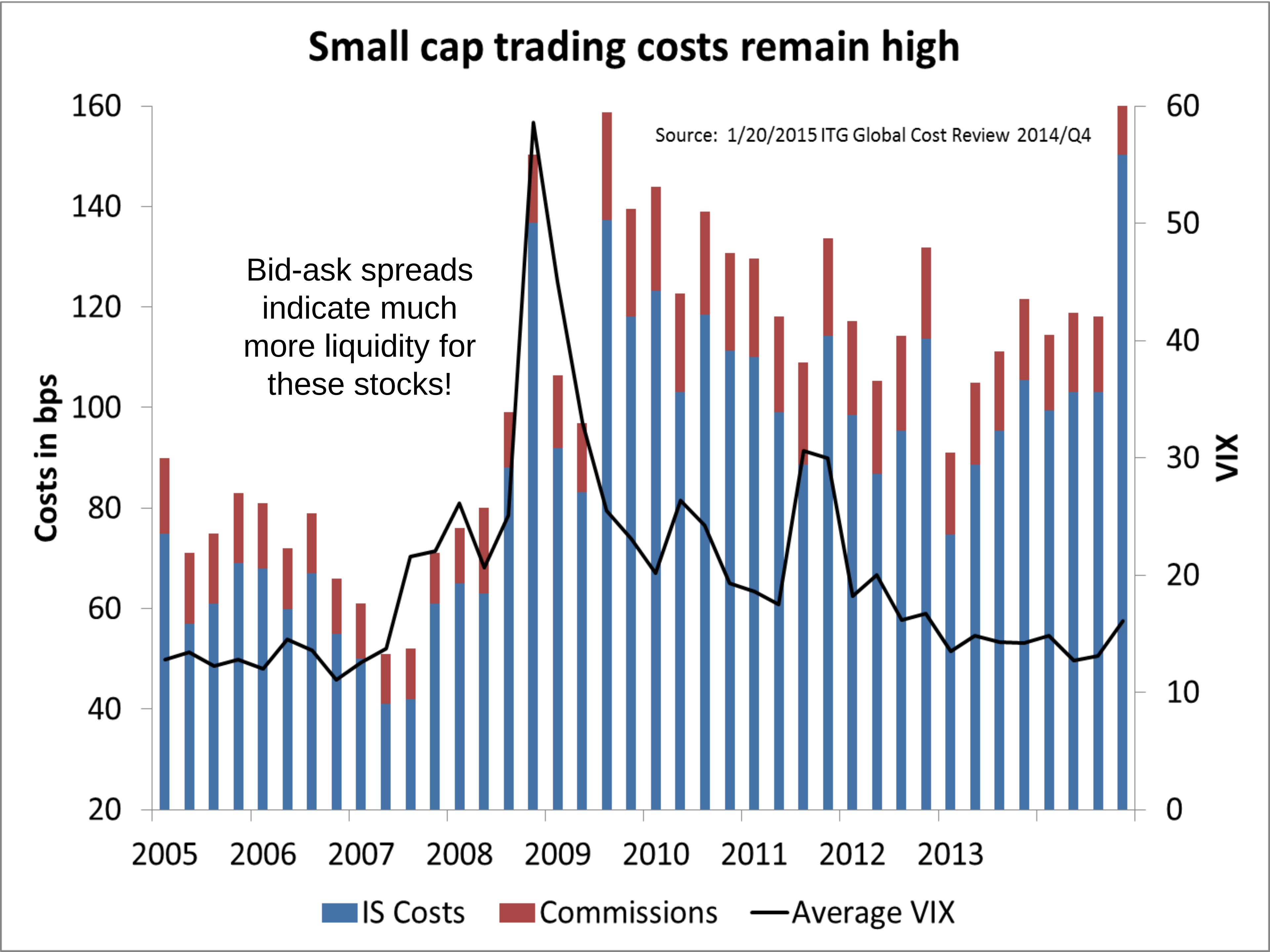
9:16am: $10 mm at 100-2/32

9:18am: $20 mm at 100-4.5/32

- Average execution price: 100-3/32
- Slippage is 3/32 or 9.375 basis points



Large cap trading costs have trended down
Source: 1/20/2015 ITG Global Cost Review 2014/Q4
Here, bid-ask spreads tell a similar story.
Costs in bps
VIX
80
60
40
20
60
50
40
30
20
10
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
IS Costs
Commissions
Average VIX


Small cap trading costs remain high
Source: 1/20/2015 ITG Global Cost Review 2014/Q4
Bid-ask spreads indicate much more liquidity for these stocks!
Costs in bps
VIX
160
140
120
100
80
60
40
20
60
50
40
30
20
10
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
IS Costs
Commissions
Average VIX

Deutsche Bank

Fixed income normalization and bond market liquidity

October 2015

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Passion to Perform

Rates and vol normalization are coming

Front-end and long-end rates will move up to higher levels over the coming years.

This normalization process will also include a normalization of volatility in all financial markets

The smoother the normalization is, the better it is for the economy.

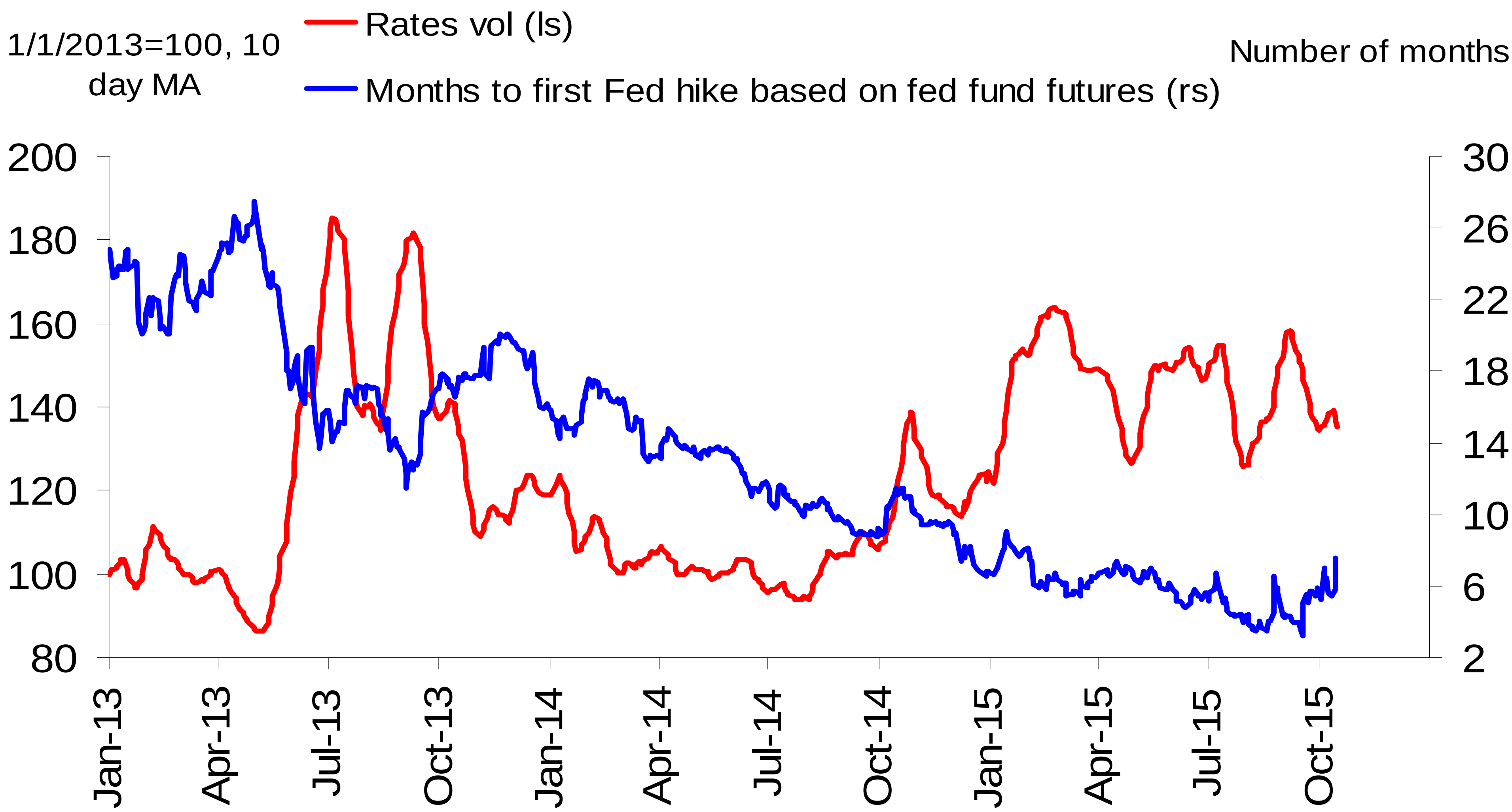
But:

-Low bond market liquidity is magnifying volatility

-Unpredictability of monetary policy increases volatility

-If global forces holding US rates down disappear then we will also see more volatility

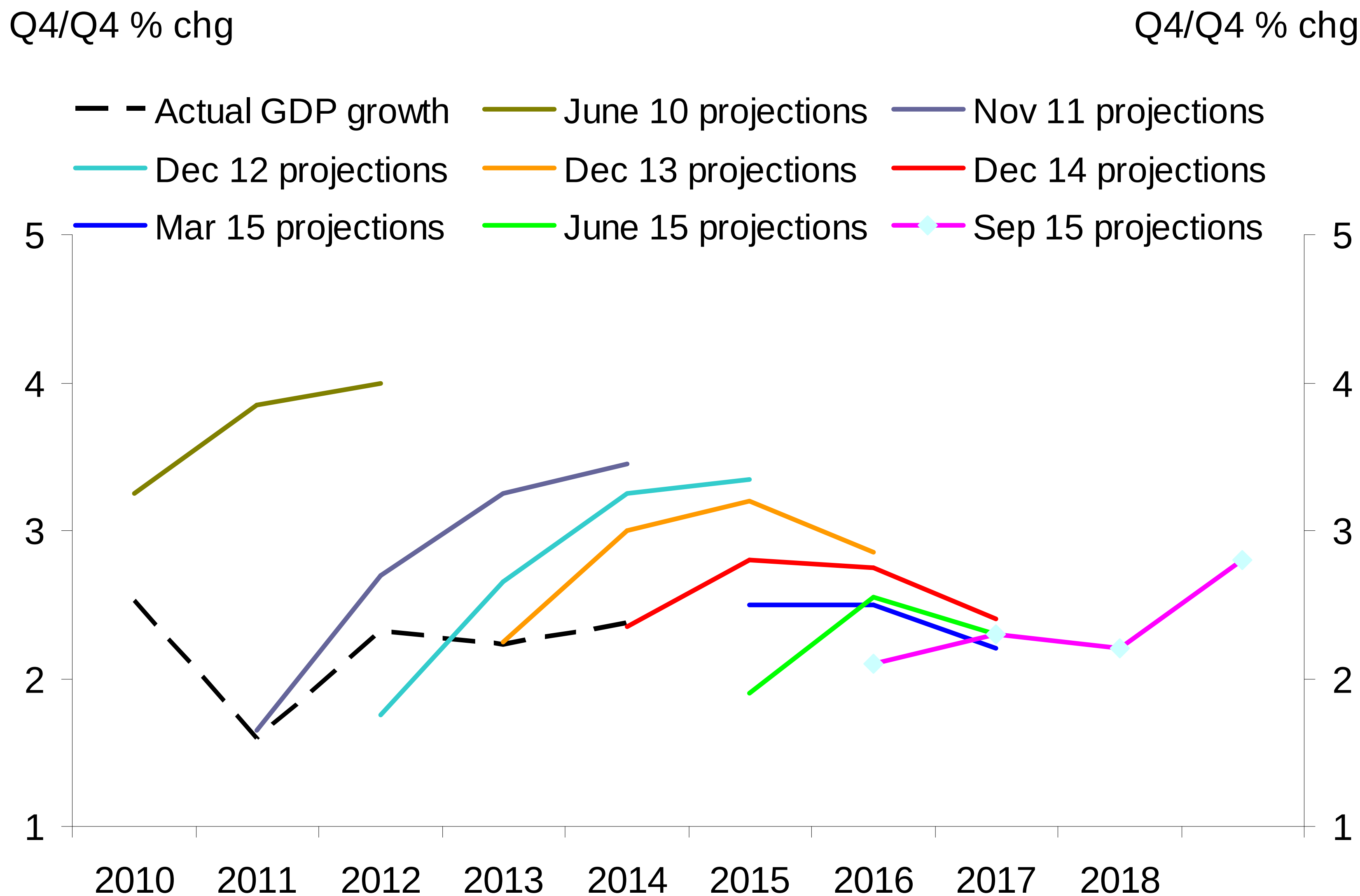
Fed liftoff is key driver of rates vol



Note: Rates vol: MOVE Index.

Source: Bloomberg Finance LP, DB Global Markets Research

For the past five years the FOMC has been too optimistic about growth



Note: FOMC forecasts are q4/q4 and actual GDP is annual data.

Source: FRB, BEA, DB Global Markets Research

So far rates remain low, but what if the forces driving rates turn around?

Forces driving US rates at the moment

- Foreign private demand (pushing rates down)
- ECB and BoJ QE (pushing rates down)
- Fed hiking slowly (pushing long rates down)

- Fed hiking (pushing rates up)
- Quantitative Tightening (pushing front-end rates up)

Bottom line:

-Low bond market liquidity is magnifying volatility

-Unpredictability of monetary policy increases volatility

-If global forces holding US rates down disappear then we will also see more volatility

Torsten Slok, Ph.D.

- **Chief International Economist, Managing Director**
- **Deutsche Bank Securities, Inc.**

- Torsten Slok joined Deutsche Bank Securities in the fall of 2005.
- Mr. Slok's Economics team has been top-ranked by Institutional Investor in fixed income and equities for the past five years. Slok currently serves as a member of the Economic Club of New York
- Prior to joining the firm, Mr. Slok worked at the OECD in Paris in the Money and Finance Division and the Structural Policy Analysis Division. Before joining the OECD he worked for four years at the IMF in the Division responsible for writing the World Economic Outlook and the Division responsible for China, Hong Kong, and Mongolia.
- Mr. Slok studied at University of Copenhagen and Princeton University. He has published numerous journal articles and reviews on economics and policy analysis, including in Journal of International Economics, Journal of International Money and Finance, and The Econometric Journal.

Appendix 1

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