Joint Staff Report: The U.S. Treasury Market on October 15

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What happened on October 15, 2014?

- Significant initial yield declines following a modestly worse-than-expected September U.S. retail sales report at 8:30 am ET
- An hour later, despite the apparent absence of news, abrupt roundtrip in prices over the course of 12-minute “event window”
  - From 9:33 to 9:39 am ET, the 10-year Treasury cash yield decreased by 16 basis points
  - Between 9:39 and 9:45 am ET, the yield reversed course, nearly retracing its decline
- Intraday range of 37 basis points fourth largest since 1998, but net change on day of only six basis points
- Trading volumes in the Treasury market on the day posted record highs, and reached 6 to 10 times their average levels during the event window
The Events of October 15

**10-Year Treasury Yield on October 15 (Cash)**

- Retail Sales
- Event Window

**Historical Intraday Yield Ranges for 10-Year Treasury (Cash)**

- Average (8 bps)
- Calendar Guidance/U.S. Downgrade, 2011 (40 bps)
- Coordinated Rate Cut, 2008 (43 bps)
- LSAP 1, 2009 (55 bps)

**October 15 (37 bps)**

Note: 1-minute observations; Yield is inversely related to price; Unless otherwise noted, intraday figures show October 15 US trading hours.

Source: Staff calculations, based on data from Bloomberg.

Note: Daily observations; 10/1998-10/2014
Source: Staff calculations, based on data from Bloomberg.
The Events of October 15

Intraday Price and Volume in 10-Year Treasury (Futures)

- % of avg
- Volume
- Price (RHS)

Cost of Conducting Trade (Cash)

- Sell $100 mm
- Buy $100 mm
- Price (RHS)

Note: 1-minute intervals; Volume as percent of average of previous 30 trading days
Source: Staff calculations, based on data from Bloomberg.

Note: 1-minute intervals; Spread between best bid/ask and volume-weighted average price to complete trade; $ per $100 par
Source: Staff calculations, based on data from BrokerTec.
The U.S. Treasury Market on October 15, 2014


Report summarizes preliminary findings on October 15 event

- Based on transaction-level public and non-public data from futures (CME) and cash interdealer markets (BrokerTec and Espeed)
  - No dealer-to-customer data included
- Describes day with focus on event window
- Describes important aspects of the current Treasury market structure as well as a series of next steps for consideration

Summary of Findings

- Analysis reveals no *single* cause for the abrupt moves
- However, a *number* of factors may have contributed:
  - Concerns about global growth, Ebola and policy weighed on investor sentiment and positions, likely triggered outsized response to data
  - Both Principal Trading Firms (PTFs) and bank-dealers reduced risk exposure to volatility
  - Significant decline in order book depth before 9:30 am ET may have impacted price discovery, transaction cost, and price impact of trades
  - During event window, marked shift in order flow and liquidity provision
    - PTFs sharply increase their activity, initiating buy (and then sell) trades
    - Bank-dealers increase activity, but to lesser degree, and intermittently withdraw offers to sell
  - Unclear whether increase in latency in futures trade processing or elevated self-trading contribute to price action
- Many of these factors reflect notable changes in market structure
Report Structure

- **Section 1**: Background on Treasury Market, Regulation, and Data
- **Section 2**: The Events of October 15
- **Section 3**: Key Findings on October 15 and the Event Window
- **Section 4**: Observations about Treasury Market Structure
- **Section 5**: Next Steps
## Section 2: Classification and Trading Characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Typical Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank-Dealer</td>
<td>Bank owned dealer engaged in client trading and market making, mix of high and low frequency, directional trading, some of which may stem from client flows, SEC-registered broker-dealer.</td>
</tr>
<tr>
<td>Non-bank Dealer</td>
<td>Independent dealer, mainly trading for clients (agency investing) or market making, mix of high and low frequency, occasional directional trading stemming from client flows, SEC-registered broker-dealer.</td>
</tr>
<tr>
<td>Hedge Fund</td>
<td>Agency investing (rule 144A), no leverage restrictions, some automated market making but mostly low frequency trading, may be registered as broker-dealer, but does not have clients as in a typical broker-dealer business model.</td>
</tr>
<tr>
<td>Asset Manager</td>
<td>Agency investing for retail or institutional investors, limited leverage, long investment horizon, intermittent large directional flows spanning multiple trading sessions, low frequency trading.</td>
</tr>
<tr>
<td>Principal Trading Firm (PTF)</td>
<td>Principal investor, deploys proprietary automated trading strategies, low latency typically key element of trading strategies, may be registered as broker-dealer but does not have clients as in a typical broker-dealer business model.</td>
</tr>
</tbody>
</table>
### Volume on October 15 by Firm Type (Cash)

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>5 Year</th>
<th>10 Year</th>
<th>30 Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Manager</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Bank/Dealer</td>
<td>30.1%</td>
<td>35.7%</td>
<td>40.6%</td>
</tr>
<tr>
<td>Hedge Fund</td>
<td>9.0%</td>
<td>5.6%</td>
<td>6.0%</td>
</tr>
<tr>
<td>PTF</td>
<td>57.1%</td>
<td>54.8%</td>
<td>51.4%</td>
</tr>
<tr>
<td>Non-bank Dealer</td>
<td>3.9%</td>
<td>3.9%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

| Total Volume ($ millions) | 150,386 | 123,198 | 21,915 |

**Note:** Unless otherwise noted, tables are based on entire trading session, 19:30 prev. day – 17:30 ET  
**Source:** Staff calculations, based on data from BrokerTec

### Volume on October 15 by Firm Type (Futures)

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>5 Year</th>
<th>10 Year</th>
<th>Long Bond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Manager</td>
<td>4.0%</td>
<td>3.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Bank/Dealer</td>
<td>11.5%</td>
<td>17.6%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Hedge Fund</td>
<td>7.8%</td>
<td>8.3%</td>
<td>8.7%</td>
</tr>
<tr>
<td>PTF</td>
<td>69.3%</td>
<td>59.4%</td>
<td>64.9%</td>
</tr>
<tr>
<td>Non-Bank Dealer</td>
<td>1.4%</td>
<td>2.4%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Other</td>
<td>6.0%</td>
<td>8.9%</td>
<td>11.2%</td>
</tr>
</tbody>
</table>

| Total Volume ($ millions) | 498,546 | 779,519 | 229,408 |

**Note:** Unless otherwise noted, tables are based on entire trading session, 18:00 prev. day – 16:00 ET; Front month contract  
**Source:** Staff calculations, based on data from CME Group
Section 3: Key Findings on October 15 and the Event Window

10-Year Intraday Volume by Firm Type (Cash)

- $ millions
- 8,000, 7,000, 6,000, 5,000, 4,000, 3,000, 2,000, 1,000, 0
- 8:00, 10:00, 12:00, 14:00, 16:00
- Note: 5-minute intervals; Gross volume
- Source: Staff calculations, based on data from BrokerTec.

10-Year Intraday Volume by Firm Type (Futures)

- $ millions
- 25,000, 20,000, 15,000, 10,000, 5,000, 0
- 8:00, 10:00, 12:00, 14:00, 16:00
- Note: 5-minute intervals; Gross volume; Front month contract
- Source: Staff calculations, based on data from CME Group.
Section 3: Key Findings on October 15 and the Event Window

10-Year Cumulative Net Aggressive Volume (Cash)

- PTF
- Other
- Aggregate

10-Year Cumulative Net Passive Volume (Cash)

- Other
- Hedge Fund
- Aggregate
- PTF

Note: Stacked 1-second observations
Source: Staff calculations, based on data from BrokerTec.
Section 3: Key Findings on October 15 and the Event Window

10-Year Timeline of Large Aggressive Trades (Futures)

- Bid Depth
- Ask Depth
- Buy Volume
- Sell Volume (LHS)
- Price (RHS)

Note: Trades > 2000 contracts; $200 million notional; Top 10 levels; Front month contract
Source: Staff calculations, based on data from CME Group.
Section 3: Key Findings on October 15 and the Event Window

**Depth at Top 3 Levels by Type (Cash)**

- $ millions
- Note: 1-minute moving average; Sum of top 3 levels
- Source: Staff calculations, based on data from BrokerTec.

**10-Year Bid/Ask Spreads by Type (Cash)**

- $ per 100 par
- Note: 1-second observations; $ per $100 par
- Source: Staff calculations, based on data from BrokerTec.
Section 3: Key Findings on October 15 and the Event Window

10-Year Total Market Depth (Futures)

Self-Trades as % of Total Volume

Note: 1-second observations; Front month contract
Source: Staff calculations, based on data from CME Group.

Note: 1-minute intervals
Source: Staff calculations, based on data from BrokerTec, CME Group.
Section 4: Observations about Treasury Market Structure

**Gross Treasury Positions of Primary Dealers**

- $ billions
- %

- Position
- Position as % of Debt Outstanding, ex-Fed (RHS)

Note: 4-week moving average; Sum of dealers’ short and long positions
Source: Staff calculations, based on data from FRED NY.

**Government Bond Fund Flows**

- $ billions

Note: Total net monthly flows; Some funds own agency debt securities and MBS in addition to Treasury securities
Source: Staff calculations, based on data from Morningstar.

**Treasury Benchmark Bid-Ask Spreads (Cash)**

- 256ths
- 2 Year
- 5 Year
- 10 Year

Note: 21-day moving average; $ per $100 par; On-the-run notes
Source: Staff calculations, based on data from BrokerTec.

**Benchmark Price Impact (Cash)**

- 32nds per $100 million

Note: Slope coefficients from weekly regressions of 5% price changes on 5% net order flow for the on-the-run notes
Source: Staff calculations, based on data from BrokerTec.
Section 4: Next Steps

- Further study of the evolution of the U.S. Treasury market and the implications for market structure and liquidity

- Continued monitoring of trading and risk management practices across the U.S. Treasury market and a review of the current regulatory requirements applicable to the government securities market and its participants

- An assessment of the data available to the public and to the official sector on U.S. Treasury cash securities markets

- Continued efforts to strengthen monitoring and surveillance and promote inter-agency coordination related to the trading across the U.S. Treasury market