The Microstructure of the TIPS Market

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Motivation

- Introduction of TIPS offered multiple possible benefits
  - Hedge against inflation => lower Treasury borrowing costs
  - Market-based measure of inflation expectations
- Benefits not fully realized because of lack of liquidity
  - Liquidity premium offsets inflation risk premium
  - Liquidity premium complicates inferences of inflation expectations
- Despite importance of liquidity and large market size, there is virtually no quantitative evidence on TIPS liquidity

Objectives

Use novel tick data from the interdealer market to characterize the liquidity of the TIPS market, including:

- Trading activity and liquidity by sector
- Liquidity over securities’ life cycles
- Intraday patterns
- Effects of announcement at daily and intraday frequency

Related Literature

- Work examining microstructure of nominal Treasury market, including various liquidity and announcement effect studies
  - Numerous papers by Fleming and others
- Studies of announcement effects in indexed market
  - Beechey and Wright (2008), in particular
- Papers on inflation risk premium and liquidity premium

Remainder of Talk

- Market structure
- Data
- Empirical results
- Conclusions

Market Structure

- Like nominal market, with over-the-counter secondary market, central role for dealers, and interdealer trading via brokers
- At auction, TIPS are bought more by investment funds and less by foreign accounts and dealers and brokers
- Dealers aggregate TIPS position is usually close to flat
- Trading occurs via outright trades, breakeven inflation trades, and issue-for-issue switch trades

Data

- Proprietary tick data for outright trading in interdealer market
- March 4, 2005 to March 27, 2008 sample period
- Outright TIPS trading averages $562 million per day
  - Accounts for about 42% of interdealer trading (over sample)
  - Much of remainder: breakeven inflation trades
- TIPS trading accounts for ~1% of interdealer Treasury trading
  - TIPS account for 7-10% of outstanding Treasury debt over sample

Trading Activity by Sector

Sector	Volume	Number of Trades	Trade Size
5 year	109.6	11.2	9.5
10 year	402.7	46.4	8.8
20 year	36.4	7.5	4.7
30 year	13.4	4.3	3.2
Total	562.1	69.4	7.1

Trading Activity by On-the-Run/Off-the-Run Status

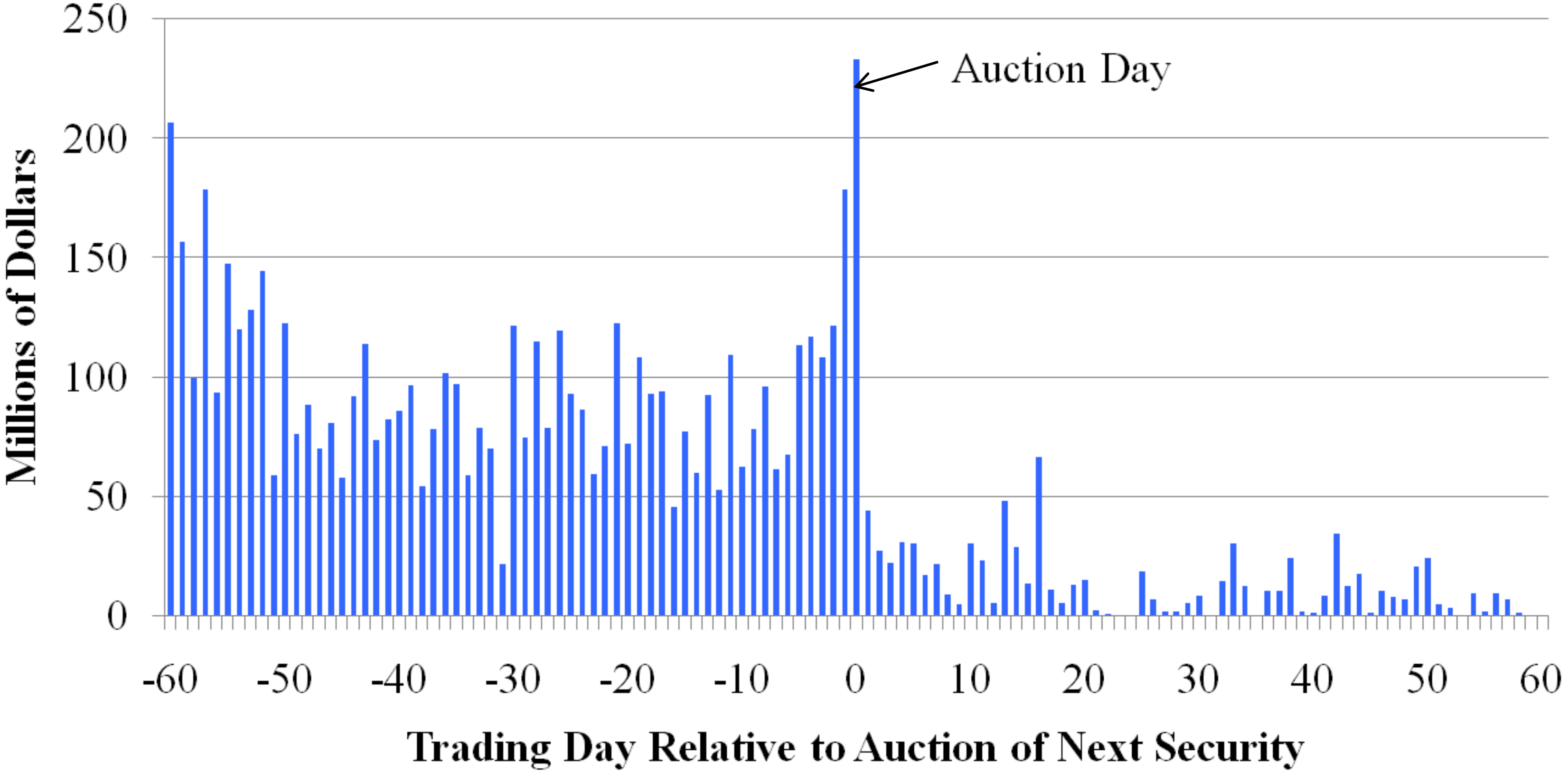
Panel A: On-the-Run Securities

Sector	Volume	Number of Trades	Trade Size
5-year	86.6	9.1	9.3
10-year	136.3	18.2	7.2
20-year	29.7	6.2	4.6

Panel B: Off-the-Run Securities

Sector	Volume	Number of Trades	Trade Size
5-year	27.2	2.1	10.9
10-year	21.9	2.4	9.0
20-year	6.4	1.3	5.3

Trading Volume Around Off-the-Run Date

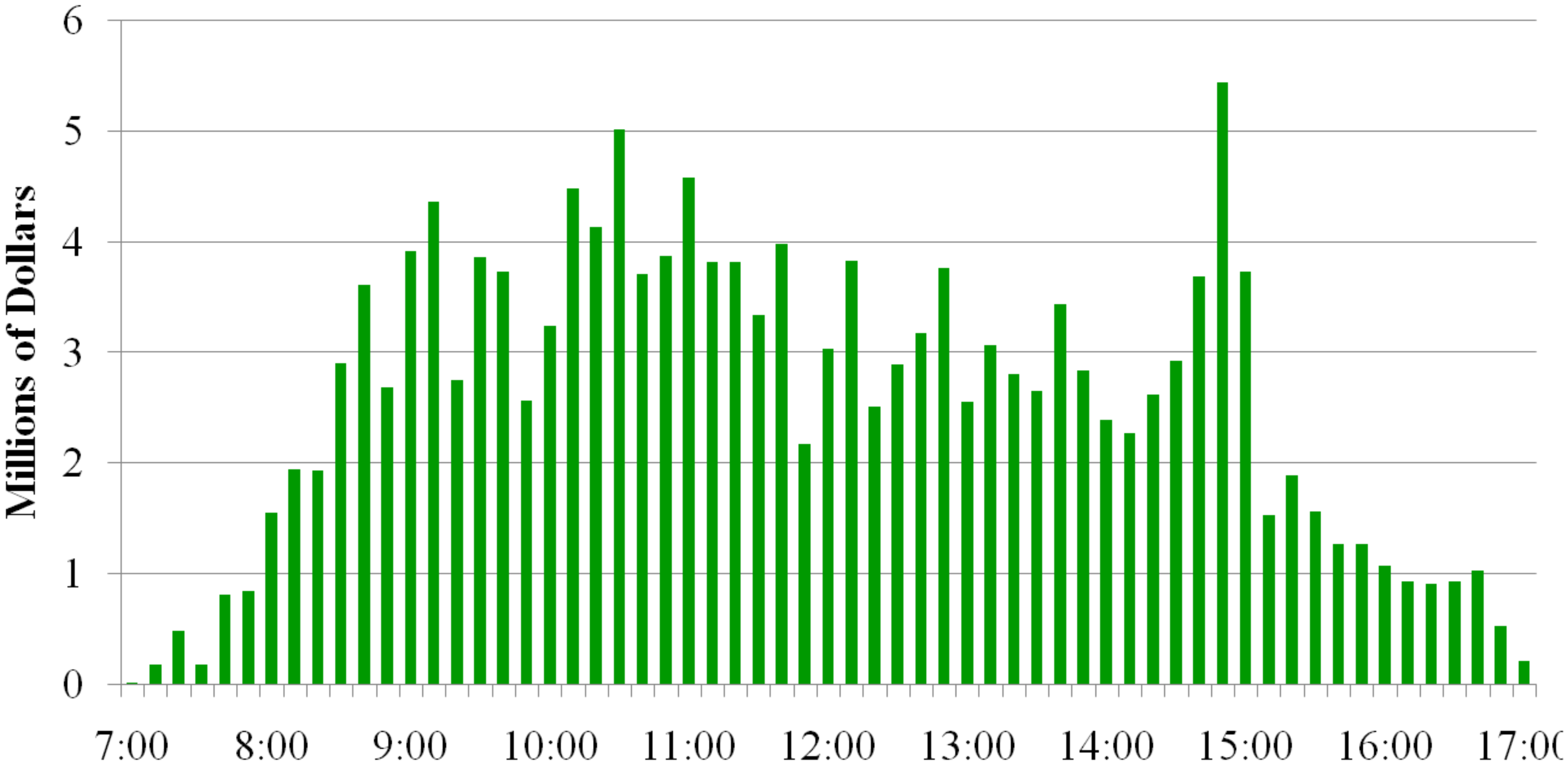


Quote Measures by On-the-Run/Off-the-Run Status

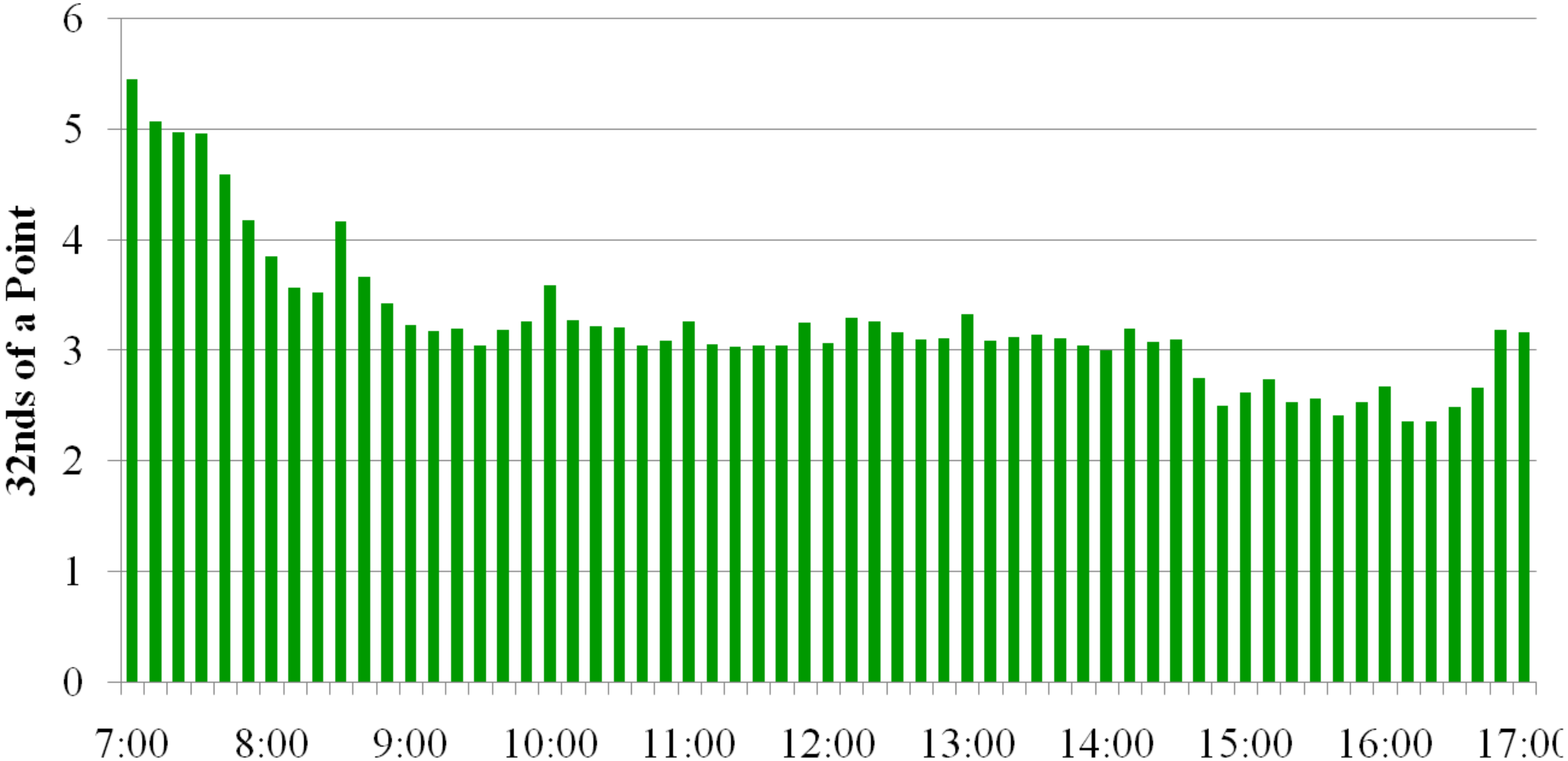
Panel A: On-the-Run Securities			
Sector	**Bid-Ask Spread**	**Quote Size**	**Market Prevalence**
5-year	2.4	1.3	42.2
10-year	2.9	1.3	59.7
20-year	6.8	1.1	27.4

Panel B: Off-the-Run Securities			
Sector	**Bid-Ask Spread**	**Quote Size**	**Market Prevalence**
5-year	2.5	1.2	19.4
10-year	2.6	1.3	14.8
20-year	7.0	1.1	7.7

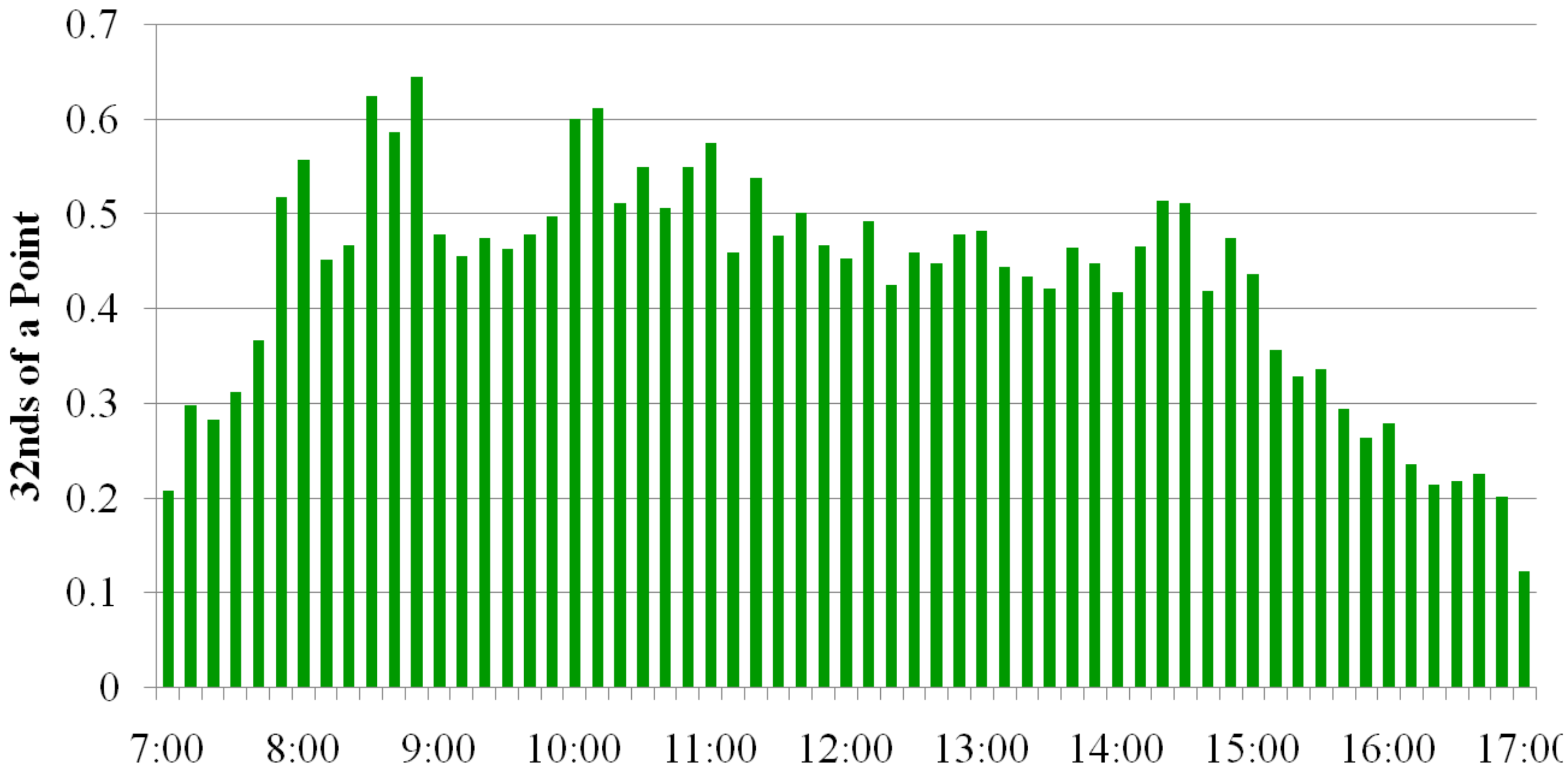
Intraday Trading Volume of 10-Year Note



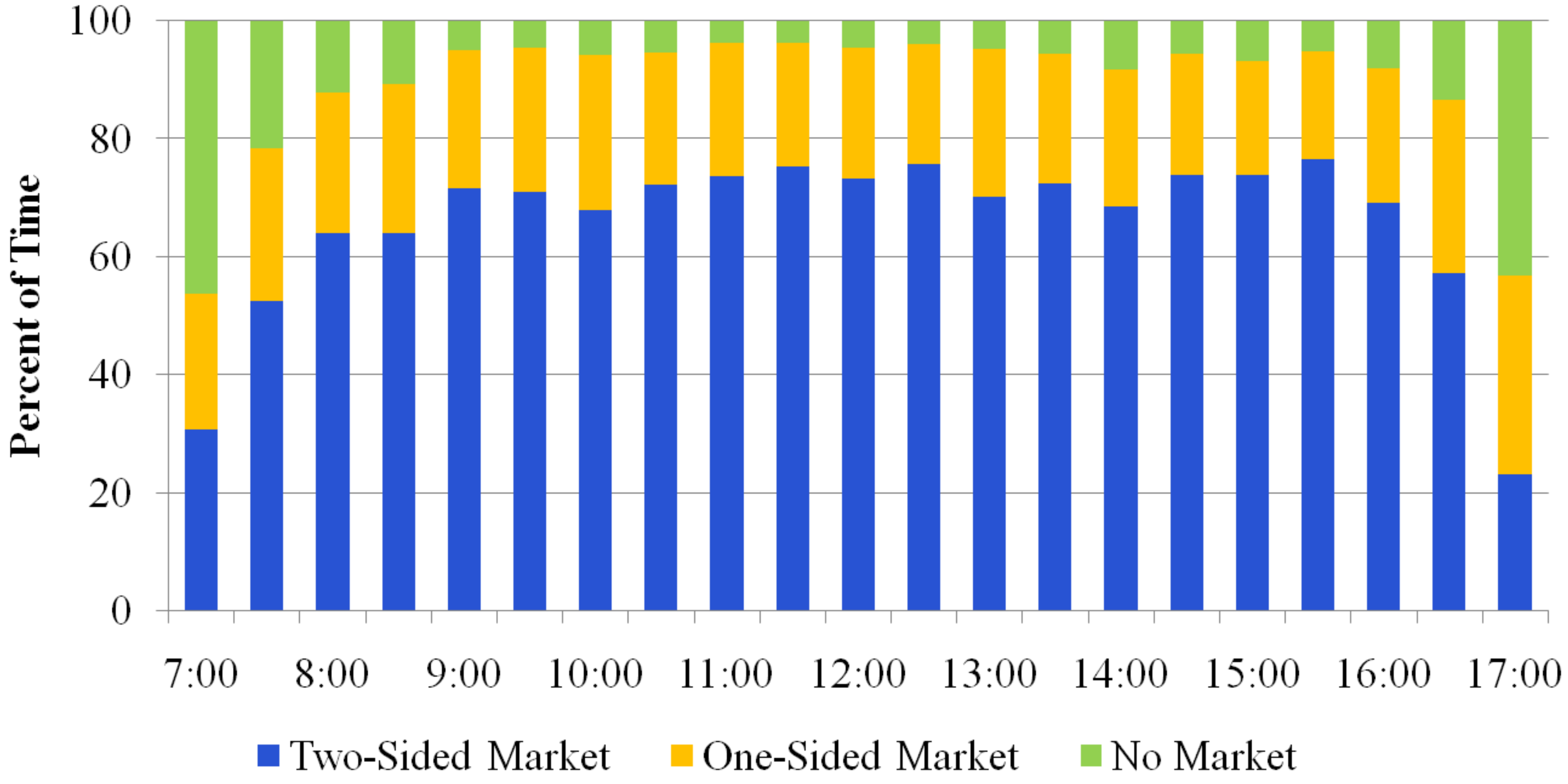
Intraday Bid-Ask Spread of 10-Year Note



Intraday Price Volatility of 10-Year Note



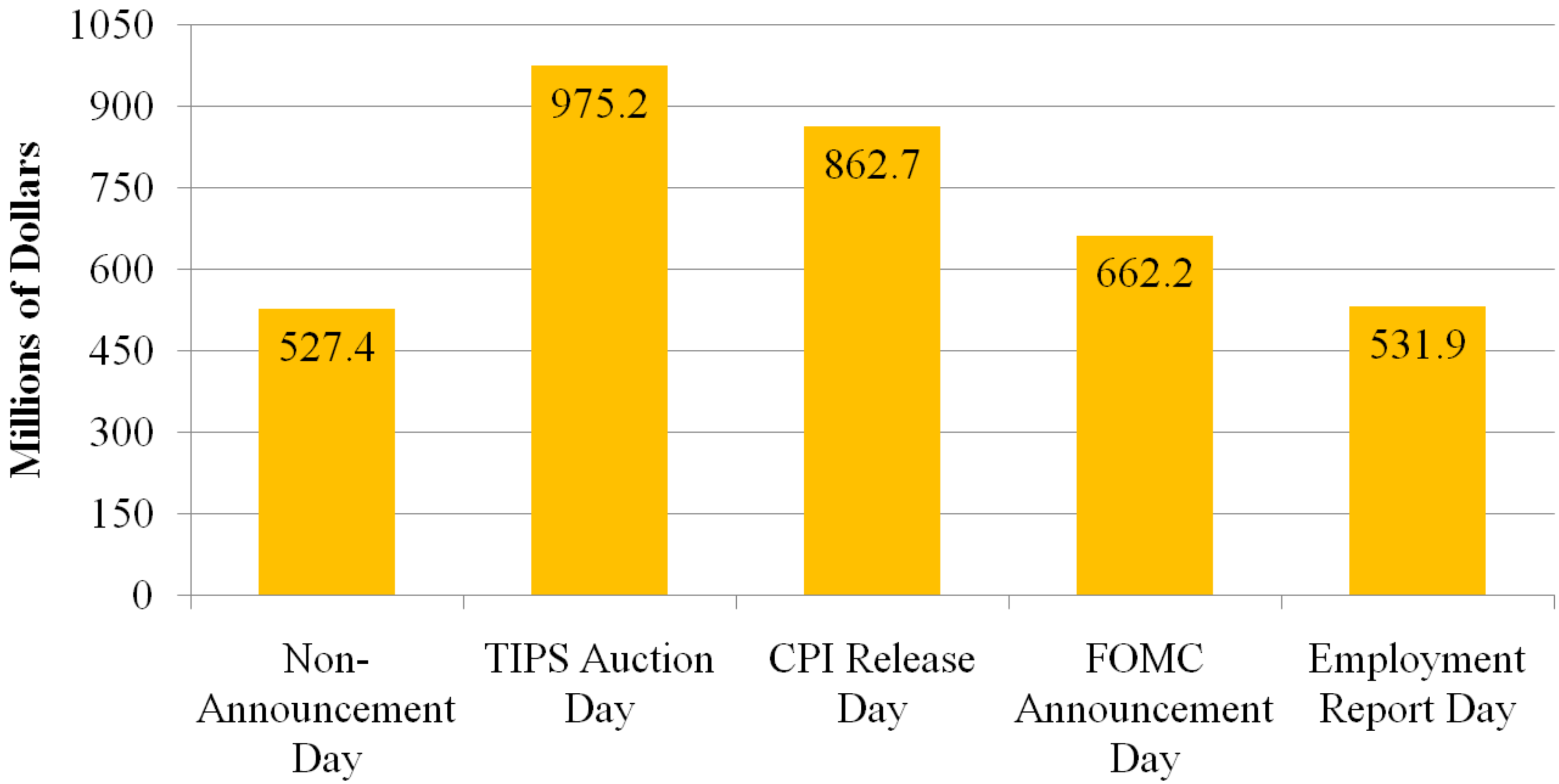
Intraday Market Prevalence of 10-Year Note



Announcement Effects at Daily Level

- Analyze effects of announcements on trading activity at a daily level
- CPI, employment report, FOMC, and TIPS auction results
- Regress trading activity on announcement dummy variables
- Results robust to day-of-week effects

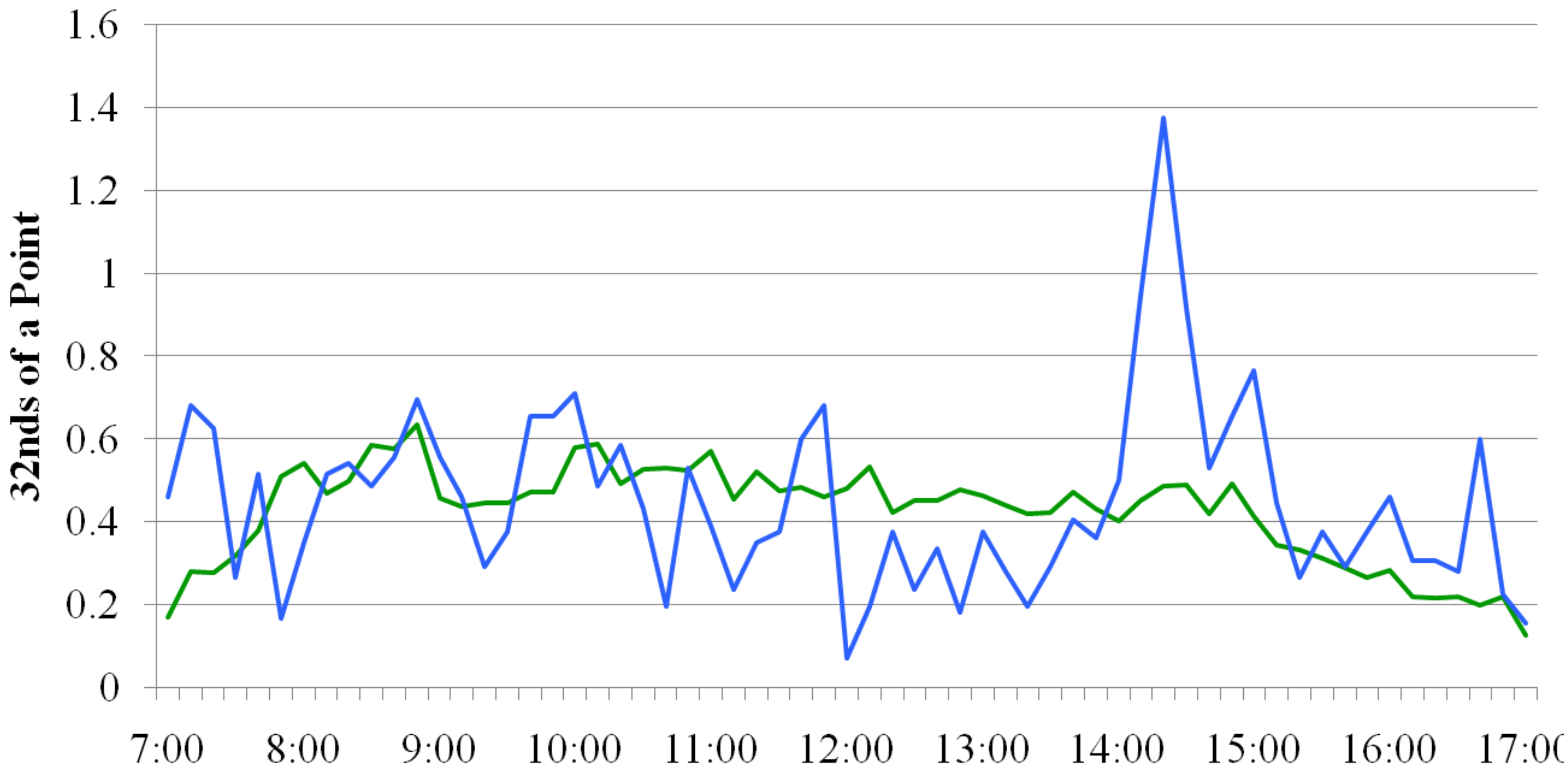
Trading Volume on Annt. and Non-Annt. Days



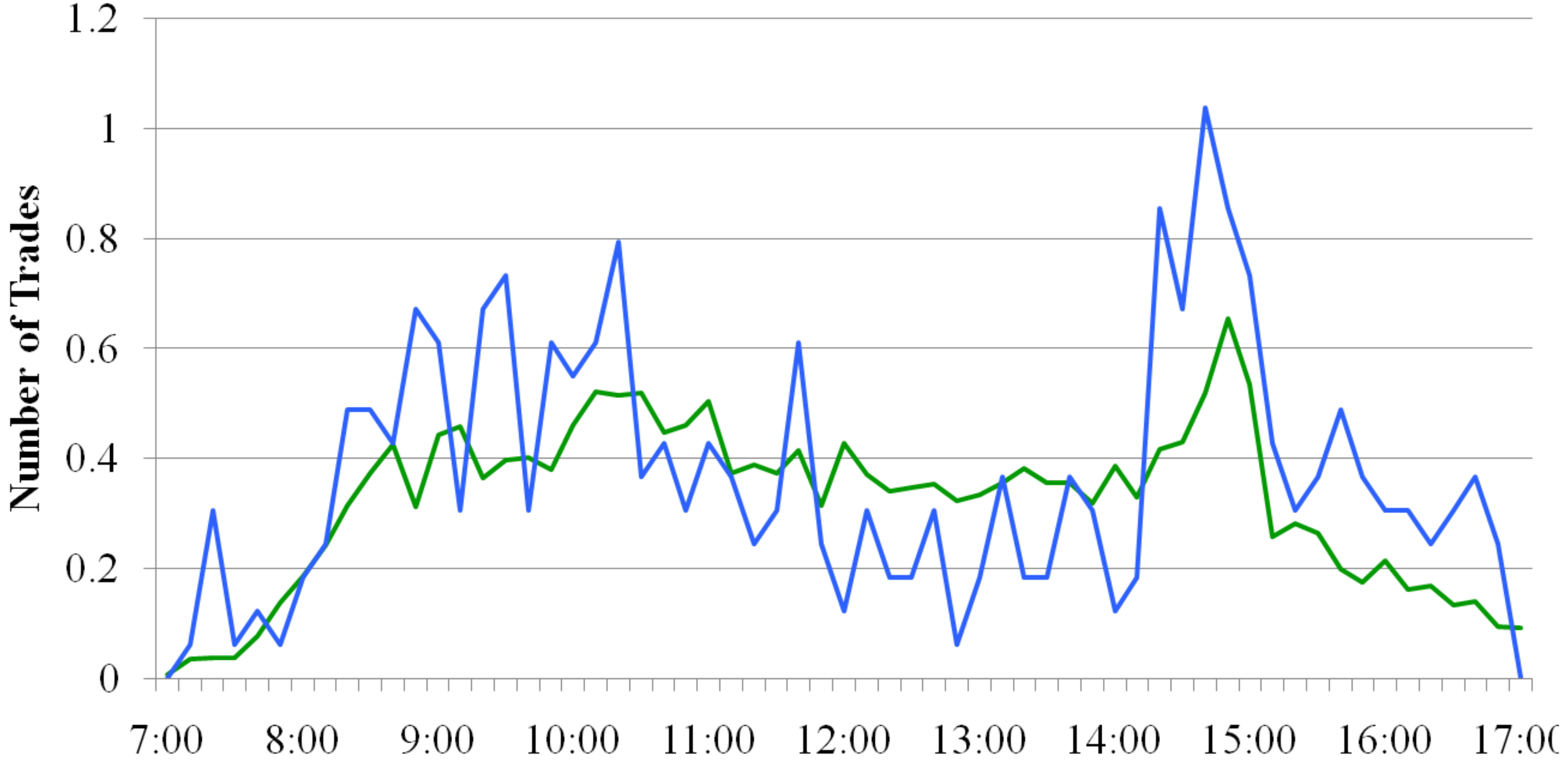
High-Frequency Analysis of Announcement Effects

- Able to discern announcement effects more precisely
- Focus on price volatility, trading frequency, bid-ask spreads
- Compare announcement days to non-announcement days
  - Effectively control for intraday patterns
- Consider same announcements as before

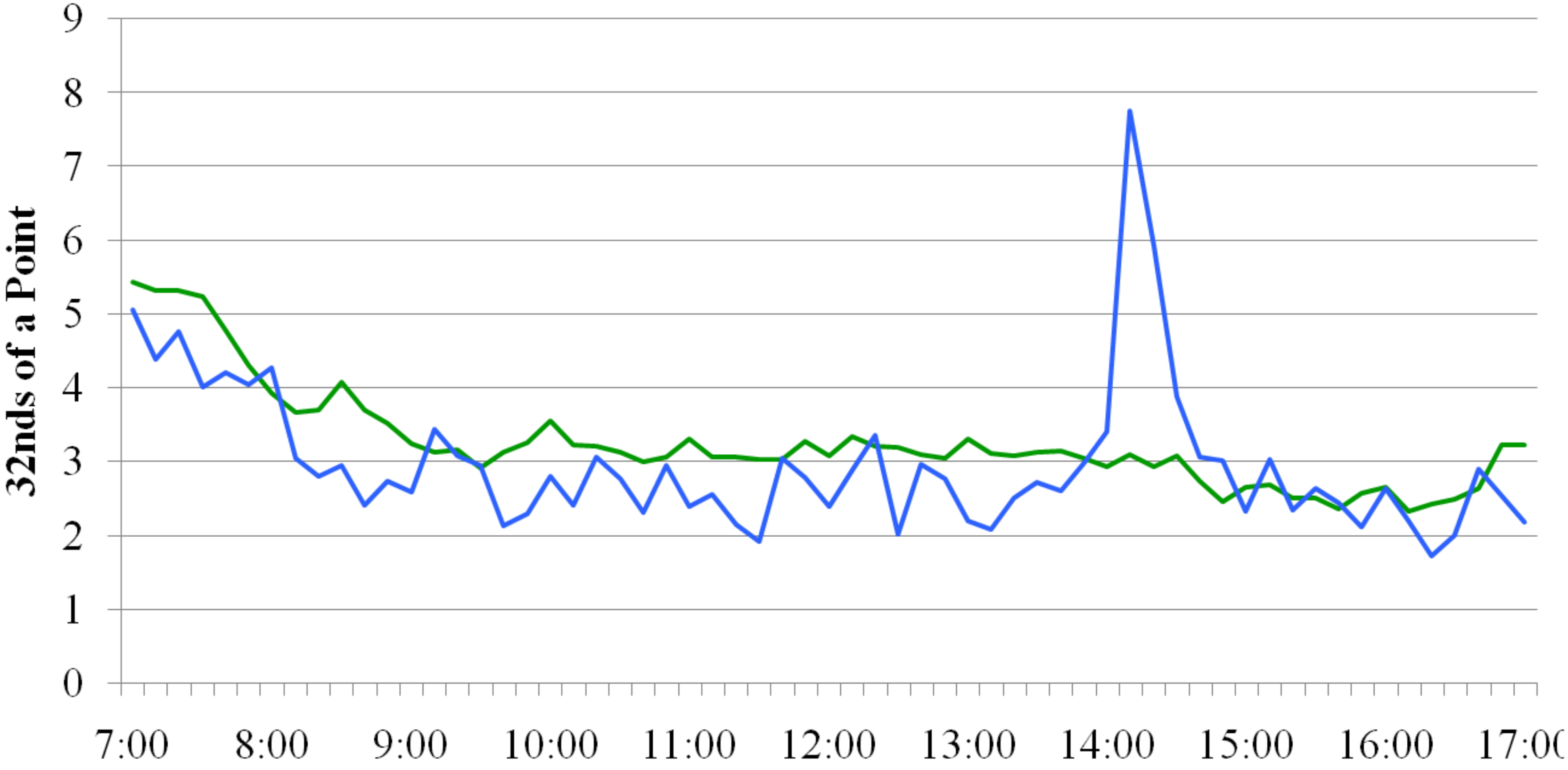
Price Volatility on FOMC and Non-Annt. Days



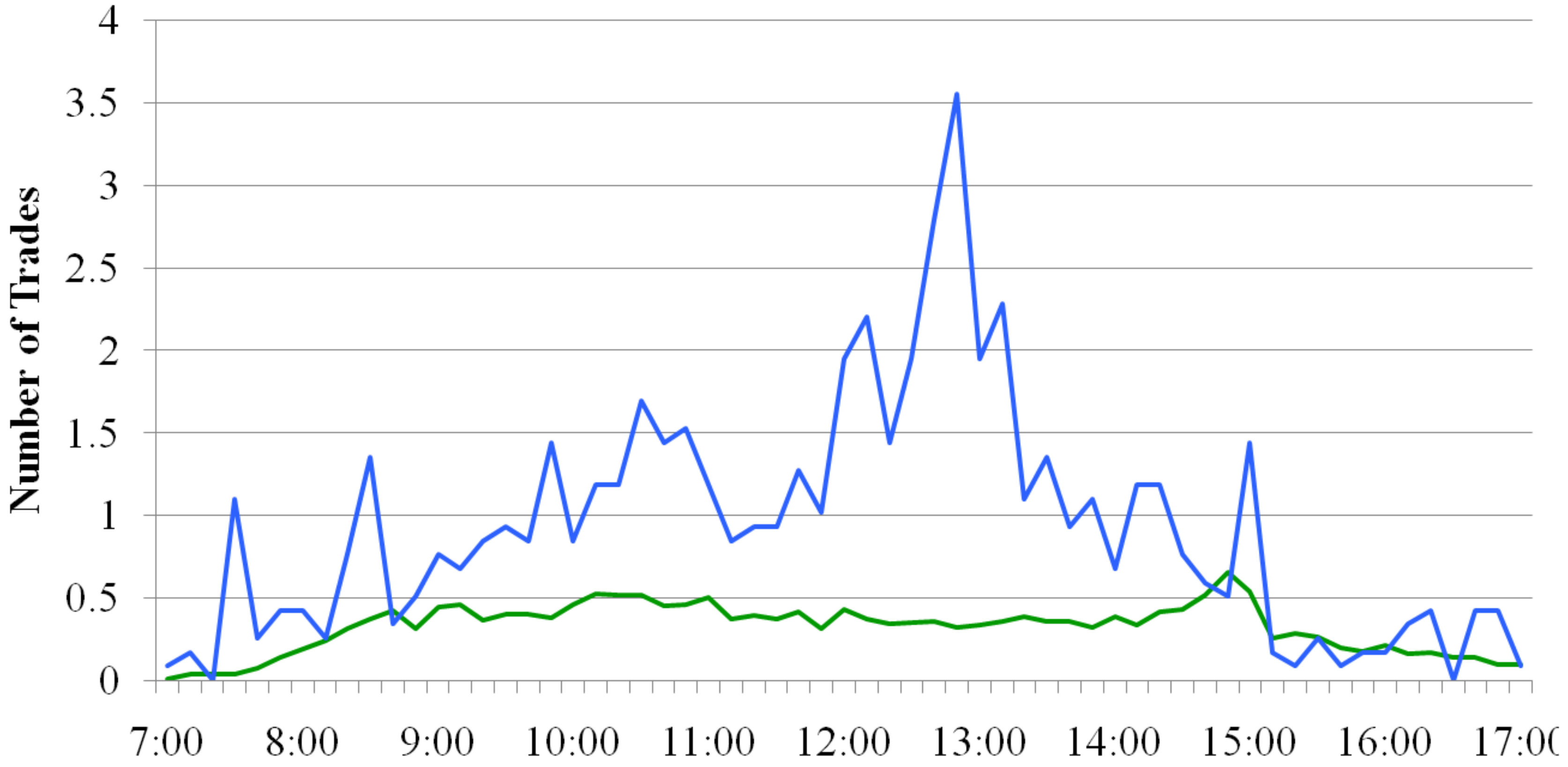
Trading Frequency on FOMC and Non-Annt. Days



Bid-Ask Spread on FOMC and Non-Annt. Days



Trading Frequency on Auction and Non-Annt. Days



Conclusions

- Identify features seen in nominal market; also new features
- Bid-ask spreads are poor cross-sectional liquidity measure -- they do not differ despite other liquidity/activity differences
- Ownership and uses of TIPS probably behind intraday pattern of activity, which differs from nominal market
- Cash flow attributes of TIPS and market size/ownership likely explain importance of CPI and auction announcements