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Electronic trading & the growth of automated trading strategies

ECB Bond Market Contact Group, 19th January 2016

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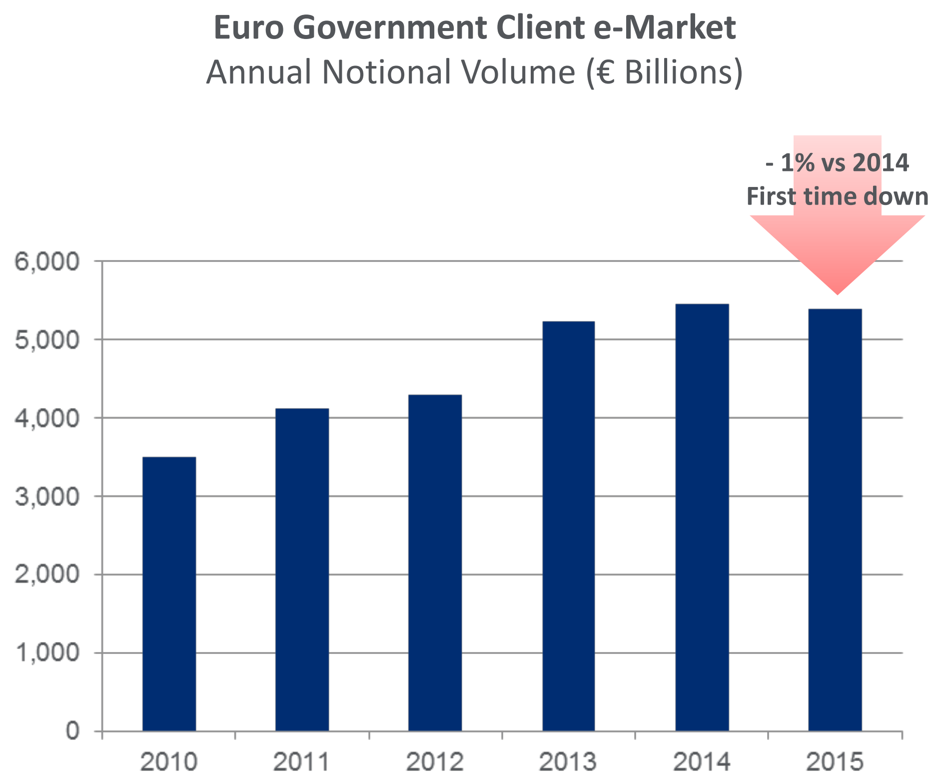
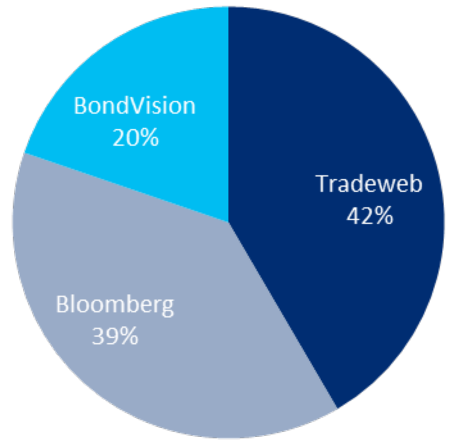
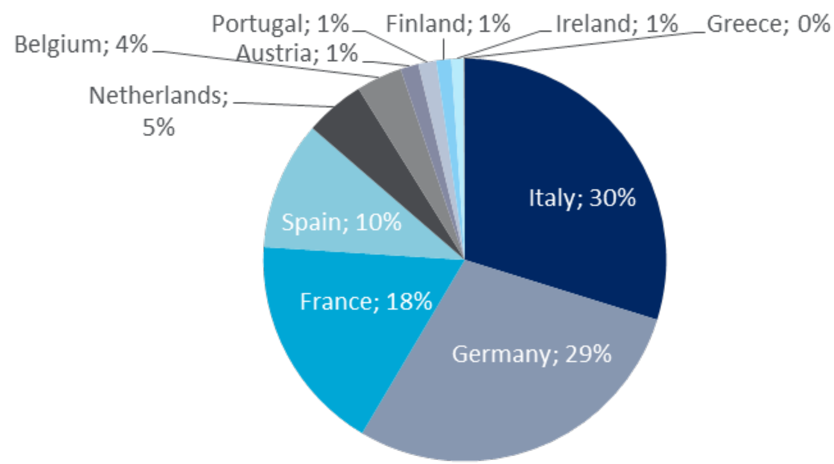
Euro Government Fixed Income Cash: Electronic Trading



Source: Tradeweb, Bloomberg, BondVision

2015





European Electronic Fixed Income: Current Market structure

European e-Markets	Dealer-to-Client		Dealer-to-Dealer	*Retail*
Matching	RFQs		Central Limit Order Book (CLOB) *price-driven*	*Central Limit Order Book (CLOB)*
No. of instruments	Thousands of bonds		Limited bonds	*Hundreds*
Types of trades	Outright, non-standard, multi-leg		Outright, standard, single leg	*Outright, standard, single leg*
Pricing	Indicative prices streamed		Firm prices streamed	*Firm*
Size	Larger Size (largest go to voice)		Reasonable size	*Tiny*
Anonymity	Name give-up pre & post-trade		Anonymous pre- and mostly post-trade	*Anonymous pre- and post-trade*
Market places	Multi-dealer platforms dominate (v few single dealer)			
Examples	Tradeweb, Bloomberg, BondVision		Brokertec, MTS Markets	*Stock exchanges, EuroMOT, Euronext*
	Client Side	**Dealer Side**		
Participant Types	Institutional clients mainly asset managers	Dealers only *(except 1 hedge fund on-SEF)*	Dealers only	
Trade match automation	High touch, all manual	Some auto-response	Low touch, mostly automated	
Degree of Automation	Automation focused on increased efficiency: - Order Management Systems - Trading tools e.g. bid lists - Post-trade processing of tickets **Most new e-initiatives aim to ease finding liquidity/inventory*	Automation focused on inquiry handling: - Certainty in mids - Spread & tier management - Auto-responding - Auto-hedging - Others e.g. risk, credit	Automation focused on Speed: - Data feeds - Trading APIs - Fibre optic networks - Co-location	
Speed	**Low Speed**	**Moderate Speed**	**High Speed**	
"Openness" of Access	Limited	Limited	Limited	

How does European cash govt e-market compare?

Broker mkts 2015	# Securities Traded	# Securities 25% Volume	# Securities 50% Volume
BTEC TRSY	347	5*	15*
BTEC EUGV	643	31	99
MTS EUGV	726	37	95

Source: MTS, Brokertec

Most open & most automated

Openness of Access

Tradeweb 2015	# Securities Traded	# Securities 25% Volume	# Securities 50% Volume
TRSY	713	15	53
EUGV	1274	32	110

Source: Tradeweb

Broker markets

Bond futures markets
Truly open access
e.g. Eurex, CBOT

D2C markets

UST broker markets
- Dealers
- High frequency firms

Least automated & least open

EG cash D2C markets: Clients
Mainly asset managers

EG cash D2C markets: Dealers
Dealers only

EG cash broker markets
Dealers only

High touch, all manual
Milliseconds don't matter….

High & low touch
Milliseconds sometimes matter….

High speed & low/no touch
Milliseconds always matter….

Degree of speed & automated trading

* 30% on 5yr; and 54% on 5yr & 10yr

Automated Trading Strategies - Good or bad?

What are automated trading strategies?

- **Automated strategies follow a specific logic or algorithm:**
  - Hedging: - *Client/real flows*
  - Speculating/arbitrage: - *Relative value: mispricing/arbitrage opportunities*
    - *Technology: speed-based advantages e.g. latency arbitrage*
- **Automated trading strategies are prevalent on: central limit order books which have open access and few concentrated points of liquidity**

Rewards of an open access CLOB

- **Greater efficiency** through increased automation
  - Fewer operational errors through straight through processing (STP)
  - Greater competition through open nature
  - Lower bid-offer spreads therefore lower cost of trading
- Increased no. of new players, e.g. high frequency traders, who can fill liquidity vacuum
- Lower cost of balance sheet through being able to offload risk easily
- Better & more accurate pricing encouraged because corrections happen very quickly

More **liquidity**?

e.g. Bund futures market

Risks of an open access CLOB

- **Increased market vulnerability** due to additional risks introduced into the system (v fast trading, hard to monitor) e.g.
  - "Signal risk" where a trader inadvertently advertises a significant risk move
    - Leads to "**Flash crash**" risk where selling/buying triggers even more selling/buying
  - "Follow best" strategies
- Machines not error-free which could further flood the system with other order strategies
- Encourages market manipulation strategies (spoofing, layering, wash trades)
- Increased risk of front running
- Risk of market liquidity reducing exacerbated by real flow being executed off venue

More **volatility**?

e.g. UST Flash crash: 15th Oct'14

Automated trading strategies coming to European cash markets?

US cash market

- Automation in UST broker market - with an open access CLOB - has evolved faster and more competitively compared to European cash model
- Open access with few concentrated points of liquidity is synonymous with high frequency trading firms. These firms actively deploy automated trading strategies

TabbForum Dec15:
"**Treasuries are quickly transitioning away from a dealer-driven, "cherry-picker" market to an "all-comers" market**. That is a market where all participants have to be willing to essentially take on anyone, anytime, anywhere – much like a champion boxer willing to take on "all-comers".
Clearly, this creates a fairer, more competitive market that drives down trading costs for all investors.
Yet, some **critics claim** that our **treasury markets**, like our equity markets, **are in need of immediate reform**. They point to characteristics such as constant quote changes and smaller transaction sizes to support their case"

Is this relevant in European cash market?

- **Yes…**
  - Bond **futures** market: is already operating as a high speed, open access CLOB
  - Cash **client** markets: Possible that inventory shortage pushes market to CLOB?
  - Cash **broker** markets: One IDB introducing high frequency traders to the platform
    - *Current IDB business model is being challenged: reduced dealer inventories has decreased profitability*
    - *And they are facing demand from high frequency firms*
    - *So evolving to be open access exchanges…*

Viewpoint: high frequency firm

"Only unfair & discriminatory markets have the characteristics of large size & slow moving quotes"
says Quantlab's Cameron Smith (TabbForum Dec15)

Summary: should regulation seek to curb their activity?

Automated trading strategies are not solely responsible for flash crashes & high volatility e.g. regs, QE, market structure

*BUT the fact is that **automated trading with open access** is not going away….*

So can we mitigate risks of high frequency trading to ensure market remains robust & firms participate with confidence?

Increasing confidence in fast moving electronic markets

1. **Best practices controls**
   - White paper issued by TMPG* on 9th April 2015 concluded:
     "Automated trading has the potential to increase short-term volatility in financial markets by transmitting idiosyncratic shocks from one market to another"
     - ➢ *Recommendations centre around reducing systemic risk e.g. more controls, testing, clearing*
   - MiFID2 will introduce similar controls however look more prescriptive and over-burdensome
2. **Technology controls: Platforms taking more responsibility for monitoring**
   - MTS is now monitoring for specific spoofing strategies
   - ICAP looking at "circuit breakers" to halt UST trading after large price moves (like in equities)
   - Limiting order-to-trade ratios (e.g. Euronext equities has 100:1 per security per day limit)
3. **Market architecture changes**
   - Named Post-trade introduced? This would have self-policing effects *(anonymity has arguably given players a curtain to hide behind*)
   - Encourage more single dealer platforms with integration ability to seek best execution (like FX where innovation has been impressive)

* https://www.newyorkfed.org/medialibrary/microsites/tmpg/files/TMPG%20HFT%20White%20Paper%20FINAL%20-%202015-04-08.pdf

Fixed income Automated Trading Strategies: Discussion points

Discussion points

1. Is there a way to open market access without disincentivising the primary dealer model whilst simultaneously enhancing liquidity?
2. Trading concentration in only a few securities seems to be a pre-requisite to attracting "new" liquidity providers in the market. Is there a way to encourage greater concentration in fewer securities?
3. Will there ever be a central limit order book with *fast* trading in European cash *client* markets?
4. Has the lack of high frequency trading firms participating in current "exclusive" European cash markets meant that we are *less* vulnerable to flash crashes?
5. Which automated trading strategies are particularly unhelpful to enhancing liquidity? Can we be selective? Can we encourage smartness over speed?
6. Outside of automated *trading* itself, automation in European cash markets has been reasonably high BUT *platform fragmentation* risk is increasing. Can/Should we encourage a "re-concentration" of platforms?

Appendices

Agenda item

Frank Engels and Zoeb Sachee will review the recent trends in electronic trading, including strategies impacting bond market liquidity and pricing capabilities from market makers. The analysis of the growth of automated trading strategies will try to answer the following questions:

(i) do they enhance liquidity or exacerbate volatility; and

(ii) should regulation seek to curb their activity.

Martin Scheck will complement the analysis with the recent ETF mapping study published by ICMA

Flash crash: UST example, 15th October 2014

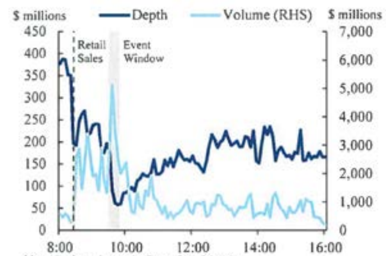
UST Broker Market Structure

- >50% electronic **volume concentrated on 6 on-the-run USTs**
- **High frequency firms participate** directly on broker markets
- Both dealers & high frequency firms utilise algorithms & fast data feeds to stream 2-way firm prices
- High frequency trading firms account for half of the trading volume
  - Sep 15 Risk.net article* showed three Chicago-based firms, **Jump Trading, Citadel Securities & Teza Technologies, accounting for 51 percent of the volume executed by the top 10 firms on BrokerTec**

UST Flash Crash 15 Oct 2014

- The US Treasury published an Official Report** into events of 15th Oct 2014
- No particular conclusion; combination of:
  - ➢ <u>New regulations</u>: dealers' reduced ability/willingness to make markets & warehouse risk in times of stress ➔
  - ➢ <u>Rise of high-speed electronic trading</u> in the U.S. Treasury market. 15% of self-trading on day (normally below 5%)
  - ➢ <u>Heavy one-way positioning</u> by big investors (betting rates increase). Short eurodolllar positions at a record by end-Sep ➔

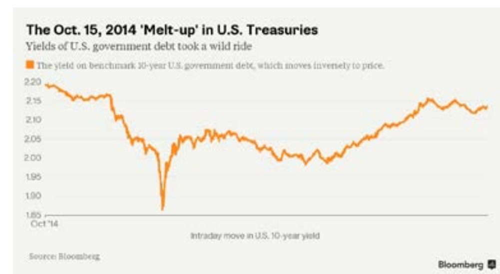
Figure 2.3: 10-Year Volume and Market Depth (Cash)



Note: 5-minute intervals; Sum of top 3 levels
Source: Staff calculations, based on data from BrokerTec.

Figure 2.8: Leveraged Funds Net Positioning in 3-Month Eurodollar Futures

Note: Weekly observations
Source: Staff calculations, based on data from CFTC (Current Traders in Financial Futures)



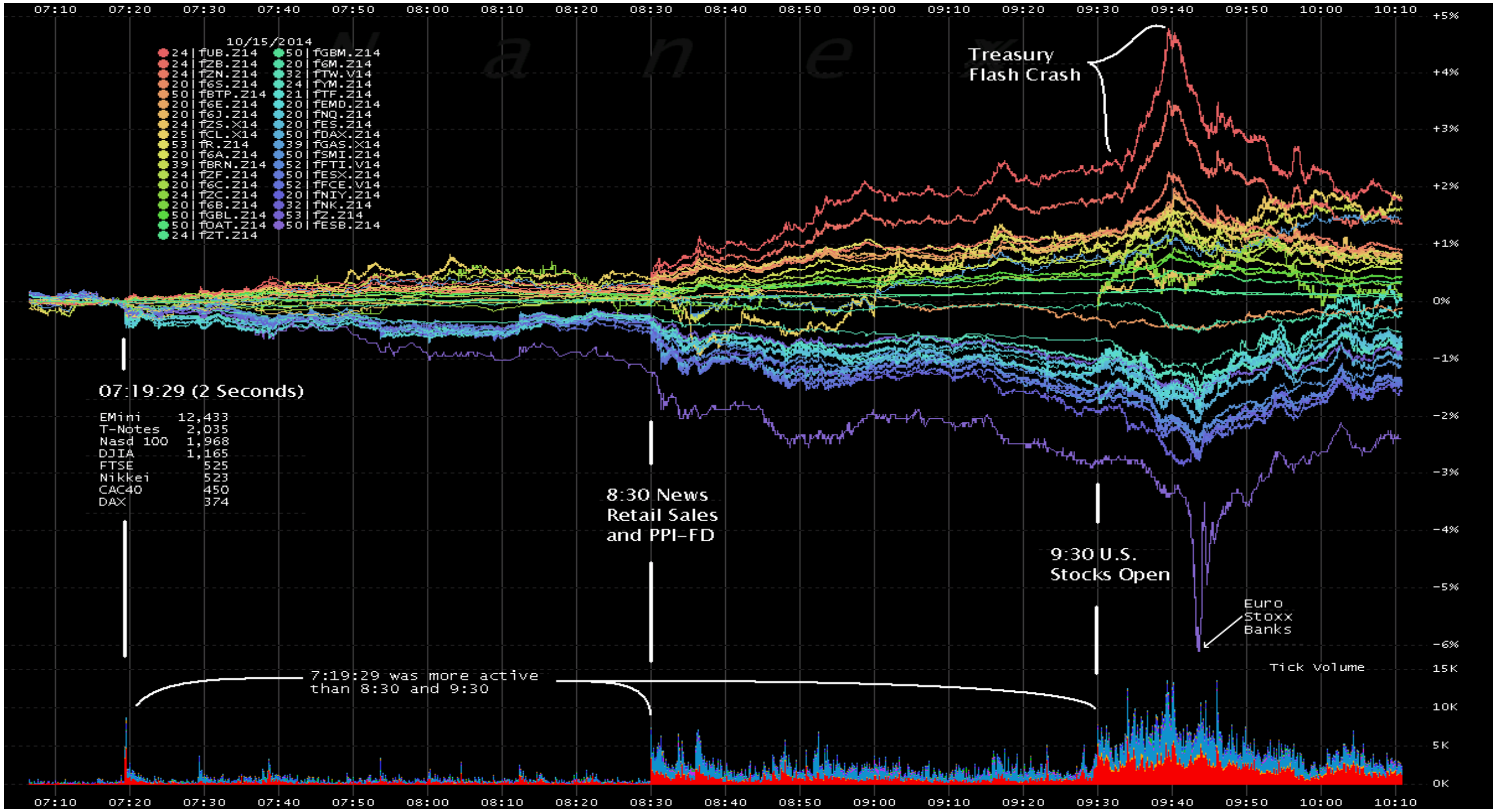
Most of the drop was in 10 minute span from 09:30am NY time

- *Intraday average yield range = 8bp*
- *15 Oct 2014 = 35bp*

* http://www.risk.net/risk-magazine/news/2426923/client-list-reveals-hft-dominance-on-brokertec
** https://www.treasury.gov/press-center/press-releases/Documents/Joint_Staff_Report_Treasury_10-15-2015.pdf

The Treasury Flash Crash - timeline

The effect of huge volumes in unusually thin, but otherwise liquid markets



On October 15, 2014 between 9:33 and 9:45, yields in U.S. Treasury Futures flash crashed. Massive trading activity in stock (most notable was that 8,169 ESA traded in 1 sec) and interest rate futures world-wide starting at 7:19:29 ET was the origin of the price move which led to a world-wide collapse in liquidity and price instability. High activity persisted for little over 2 secs and was so unusual that it eclipsed the level of activity during the 8:30 news event and the Stock Market opening. The price movement that began at 7:19:29 continued in the same direction through the 8:30 news event and the Flash Crash at 9:40. If this was a large (huge) bet, it was correct.

Source: Nanex, Citi Research