MIFID II/R ASSESSMENT & ARTIFICIAL INTELLIGENCE IN MARKETS

ECB BOND MARKET CONTACT GROUP

9 OCTOBER 2018
MiFIR Transparency Update

Real-time transparency
% of transactions/volume below post-trade SSTI

<table>
<thead>
<tr>
<th></th>
<th>Transactions</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBP Gov. bonds</td>
<td>51%</td>
<td>11%</td>
</tr>
<tr>
<td>EUR Gov. bonds</td>
<td>45%</td>
<td>11%</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>ETF</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>Credit index</td>
<td>66%</td>
<td>24%</td>
</tr>
<tr>
<td>EUR IRS</td>
<td>29%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Overall level of transparency

- Transparency rules did not create the somewhat feared market disruption
  - Investment and cooperative effort with regulators
- Challenges with market-specific rules: Gov’t. bonds vs Corp. bonds vs ETF
  - Real time transparency confined to small transactions but has not deterred on-venue trading
  - Challenges with data availability and scope have slowed down investor behavioural change
- Lack of conformity in application of transparency rules add to the challenge in meeting regulatory objectives
  - Exception being RTS 27 and 28 reports where ESMA imposed standardization
- Static data quality could be improved by enhanced regulatory ownership
- **Regulatory trajectory will continue to impact markets in next couple years including but not limited to: derivatives reform and new effective clearing mandates, SFTR, and last but not least Brexit**…
## MiFID II Impact on Various Asset Classes

**Post MiFID II, increased electronic trading volumes & market-wide behavioural changes**

- New clients and new types of clients trading more electronically – e.g. hedge funds
- Clients adapting their behaviour to electronic trading
  - Trading on venue even where not required (early adopters + ease/efficiency of trading electronically)
  - Consistency of workflows – STP / electronic audit trail
  - Less errors
  - Best execution requirements

### Estimated electronification evolution

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Est. 4Q17 E-share</th>
<th>Est. 2018 E-share</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETF</td>
<td>~70%</td>
<td>90%+</td>
</tr>
<tr>
<td>EUR Gov. bonds</td>
<td>55-60%</td>
<td>65-70%</td>
</tr>
<tr>
<td>GBP Gov. bonds</td>
<td>50-55%</td>
<td>65-70%</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>~50%</td>
<td>~60%</td>
</tr>
<tr>
<td>EUR IRS</td>
<td>15-20%</td>
<td>25-30%</td>
</tr>
<tr>
<td>GBP IRS</td>
<td>~10%</td>
<td>20-25%</td>
</tr>
</tbody>
</table>

- **ETF**: Strong momentum due to increased price transparency
- **EUR Gov. bonds**: Trading and regulatory efficiency
- **GBP Gov. bonds**: Trading and regulatory efficiency
- **Corporate bonds**: Limited regulatory impact
- **EUR IRS**: DTO as key driver for the increase, bringing new clients on venue
- **GBP IRS**: DTO as key driver for the increase, bringing new clients on venue

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Artificial Intelligence and Machine Learning technologies being extended from consumer markets to wholesale financial markets… But still very embryonic development in Fixed Income bond markets.

AI as a new branch of science embracing several different fields of academia.

Artificial Intelligence and Machine Learning are everywhere:
- Advances in chat, voice, language
- Data processing and trade execution
- Price generations, liquidity seeking, quant modeling
- Technology development and testing

Technology will not replace everything
- Market participants / traders still there → changing functionality
- Technology still infantile (needs rational drivers)

Key to successful implementation is to develop a symbiotic relationship between humans and new technologies as well as having a robust control environment…

AI and machine learning will evolve in markets

Inherent shortage of talent

Computer Science, Linguistics, Game Theory, Physics, Statistics
Areas of anticipated AI use in the near future

Buyside – automated execution

- Pre-programmed execution rules tailored to each client’s trading strategy
- Good fit for significant low-touch business

Sell Side Algo trading

- Increasing number of market makers have algo desk with separate trading book / risk from voice desk
- Algo trading tools more prevalent in certain financial instruments, e.g. Equities and FX
- Examples in Fixed Income:
  - Pre-trade: algo pricing
  - Intra-trade: algo trading performance monitoring (e.g. quote rate, hit rate, stream slippage)
  - Post-trade: Dealer and client specific reporting based on algo trading data

**Evolution**

From Simple execution rules to decision making rules (time → liquidity search → market conditions)
Discussion Points

• For what trade sizes and levels of product liquidity does real-time transparency start to disincentivise liquidity provision in the EU government bond market (given the current MiFID II publication deferral regime)?

• Will regulation or technological innovation have a greater impact on market participants adapting their behaviour to electronic trading?

• Why has AI not been adopted more quickly in bond markets (specifically government bond markets)?

• What will be the potential impact of different transparency regimes and product liquidity assessments as a result of Brexit?