HFT / Algorithmic Trading – MiFID II

Futures, Clearing and Collateral

Citi
Background

- Citi’s **Futures, Clearing and Collateral** business provides execution, clearing and collateral management services to institutional clients (i.e. Asset Managers, Pension Funds, Hedge Funds, Banks, Insurance Companies, Sovereign Wealth Funds and Corporates).

- Citi provide clearing services for over 64 exchanges and electronic execution services on 51 exchanges.

- All trades are executed on behalf of clients on listed derivatives exchanges and cleared at CCPs.

- The business model is earning commissions based on facilitating execution and clearing for it’s clients.

- **Paul Marks** heads up electronic execution product globally for Futures, Clearing and Collateral. He is also responsible for the global Electronic Trading Services Desks, which support client’s day-to-day electronic trading activity on global derivatives markets. Paul has been at Citi for 3 years and prior to that spent 8 years at J.P. Morgan in the agency Futures & Options execution and clearing business. Paul is an active contributor to many industry bodies with regards to the impact of global regulatory changes on electronic execution and risk management in the futures and options markets.
Introduction

- Electronic Trading was born in the 1990’s as markets evolved from trading in ‘open outcry’ pits. This resulted in more open access to markets, more liquidity and significantly lower costs for end users.

- Market research by providers such as Tabb indicate an increase in the use of Algorithmic Trading as traders use tools to help them reduce the market impact of their trades. Due to advances in technology in many cases traders perceive many of these order types as standard functionality. They are commonly also referred to as ‘Execution Tools’ or ‘Synthetic Order Types’.

- Regulators appear to be looking for increased transparency to monitor for Market Abuse.

- Market Abuse is an area of focus for regulators and it can come in many forms, but HFT, Algorithmic Trading or Electronic Trading alone or in combination are not abusive practices.

- As some market commentators and regulators (such as CFTC) have observed some popular concerns that have recently been expressed are not directly caused by HFT or Algorithmic Trading, but instead the nuances of the market micro-structure of the US Equity Markets.
### Example Algorithmic Trading Order Types

- The following are examples of Algorithmic Trading Order Types that Citi may provide to clients.

<table>
<thead>
<tr>
<th>Synthetic Order Types (SOT's)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceberg+</td>
<td>Releases a specific order slice into the market at a limit price, each subsequent slice is released once the previous slice is fully executed. Randomization can be applied to each slice of the order.</td>
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<tr>
<td>OCO</td>
<td>“One Cancels Other” model allows the entry of an order into a market when one order is filled, the other order is cancelled.</td>
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<tr>
<td>Bracket</td>
<td>Model allows the entry of an order into a market when one order is partially filled an OCO order is released automatically.</td>
</tr>
<tr>
<td>OTO</td>
<td>“One Then Other” model allows the entry of an order into a market when one order is partially filled, then the other order is placed into the market.</td>
</tr>
<tr>
<td>Hawkeye</td>
<td>Watches one instrument, and based on volume, absolute price, or relative change, the model releases one or multiple orders to the market.</td>
</tr>
<tr>
<td>Ghost</td>
<td>Model does not place an order until the price and volume is directly tradable on the market, replicating a hidden order type that seeks volume.</td>
</tr>
<tr>
<td>With Ticks</td>
<td>Order is placed when a user wants to exercise price discretion of a single tick or more from their limit order.</td>
</tr>
<tr>
<td>Time Sliced</td>
<td>Model will slice an order over a specific time frame defined by user; an element of randomization can be added to interval and display quantity.</td>
</tr>
<tr>
<td>Pegger</td>
<td>This model will place resting orders pegged to the current inside market price of the instrument.</td>
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<table>
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<tr>
<th>Benchmark Algorithms</th>
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<tr>
<td>VWAP (Volume Weighted Average Price)</td>
<td>Model attempts to trade according to the instrument’s historical volume profile.</td>
</tr>
<tr>
<td>TWAP (Time Weighted Average Price)</td>
<td>Model manages the execution of an order such that it achieves the Time Weighted Average Price for the order’s instrument in the time period the user has selected.</td>
</tr>
<tr>
<td>POV (Percentage of Volume)</td>
<td>Model is a volume-driven strategy designed to participate in-line with the traded volume.</td>
</tr>
<tr>
<td>POV AXIS</td>
<td>This algorithm allows the user to scale the Percentage of Volume between price levels and specify how the participation rate increases and decreases in relation to the arrival price.</td>
</tr>
</tbody>
</table>
Market Participants

- All types of market participants may use a combination of one or more of Electronic Trading, Algorithmic Trading and HFT.
- The differing interests of market participants helps ensure there is always a buyer to match with a seller for the efficient transfer of risk.

- **Hedgers**
  - Investment decision made based on variables such as price (and expected future price) of the underlying commodity, existing holdings and inventory, etc.
  - Main driver is risk management/minimization
  - Position often held to expiry, taking delivery of the underlying asset

- **Market Makers**
  - An institution or individual that quotes bid and offer prices for specific stocks or other marketable instruments that it holds in inventory (often referred to as 'makes a market in'), and is prepared and able to buy or sell those securities at any time on its own account.
  - Market makers are normally tasked with providing sufficient liquidity in order to reduce volatility in prices and maintain a 'fair and orderly market' for stocks. For example, they will typically buy a stock when there are few or no other bidders in the market yet many investors wish to sell this security.

- **Banks**
- **Corporates**
- **Asset Managers**
- **Pension Funds**
- **Sovereign Wealth Funds**
- **Retail Investors**
- **Brokers**
- **Producers**

- **Investors**
  - Can be either private or institutional (on behalf of a group of end investors)
  - Mid/Long Term investments made based on general views of the market, valuation of the underlying commodity, etc

- **Speculators**
  - Aim to benefit from price changes by committing capital and taking risk
  - Speculator buying a contract low in order to sell high in the future would most likely be buying that contract from a hedger selling a contract low in anticipation of declining prices in the future
  - Don’t actually seek to own the commodity in question
Why do participants use eTrading, Algos and HFT?

- **Improve Efficiency**
- **Reduce Error Risk**
- **Minimise Market Impact**

- The drive to use these methods of trading has predominantly been driven from a desire by clients to reduce their execution costs.

- These execution tools are developed either by the firm themselves, their DEA Provider, 3rd party trading platform vendors and sometimes exchanges themselves.

- Market share of algos is currently increasing by approx. 10% year on year (Source: Tabb). This is not driven by increased market making activity. It is heavily influenced by client’s desires to perform more self-execution and thus save on fees versus more expensive Voice and Care methods of trading (*where the order is sent to a trader at the broker and executed manually by a trader on the client’s behalf*).

- Error risk is also reduced as orders are automated rather than relying on humans to manually enter orders at the right time with the correct quantity and price. Execution tools also help clients manage large orders by slicing them up into smaller orders and working them into the market slowly.
How do participants access markets electronically?

- There are several ways on how participants can access markets electronically for DEA (see over for diagram):

  1. Using a broker (DEA provider) platform / screen.

  2. Using a proprietary 3rd party platform / screen selected by DEA user that connects to DEA provider via the FIX protocol for order transmission.

  Note: DEA providers may not be members of exchanges and so they would use a carry broker to connect to the markets. This structure is used by smaller brokers to offer ‘white labelled’ DEA to their end clients. The end clients do not know who the ultimate provider is or who owns the exchange memberships, whereas the broker with the memberships does not know the identity of their client’s underlying clients. This model has become more and more widespread in recent years as the cost of compliance for electronic trading has increased - it ensures that there is access to markets for smaller players who would not meet the client’s profile of a top tier providers.

  3. Using sponsored access to connect directly to a venue using a trading ID provided by the DEA provider.

  4. By becoming a Non-Clearing Member (NCM) / Trade Participant and connecting directly to the exchange in their own name.
What are the risks of eTrading and how are they mitigated?

- The ESMA Guidelines published in February 2012 on ‘Systems and controls in an automated trading environment for trading platforms, investment firms and competent authorities’ provided guidelines on the testing, oversight, monitoring, surveillance and risk management of electronic trading platforms:
  

- **Pre-trade** risk controls may include:
  - Max order size
  - Intra-day net position size
  - Price tolerance limits
  - Throttle limits (orders per second)
  - Kill Switch

- **Post-trade** real-time counterparty risk exposure monitoring for margin and P&L (i.e. can client meet their margin obligations).

- Real time trade **monitoring** (rejections / algo distress alerts).

- Client onboarding **due diligence** including credit and risk assessment.

- T+1 overnight **portfolio stress testing**.
Key micro-structure challenges with MiFID II for eTrading

The following technical market structure details will be key the during the consultation process:

• High level of prescriptive due diligence required for DEA providers including algo source code reviews.

• Many bi-annual reviews by different functions that could be partially duplicative.

• Consequences for white label / re-distributors of DEA access.

• Lack of clarity around level of risk management controls that GCMs (clearers) should have with regards to clearing for NCMs/Trade Participants who access the markets directly in their own name.

• End-user tagging / ownership of orders.

• Algo flagging, including those of non-participants.

• Highly prescriptive pre-trade risk limits.

• Requirement to reconcile trading activity with independent exchange FIX drop copies.

• Implications with regards to the passing of personal identifiable information.

• Linking execution systems with transaction reporting systems.

• Highly prescriptive nature of end-user DMA training requirements.
What are the potential implications of MiFID II for eTrading?

- The increased cost of compliance for DEA end-users could see participants and liquidity move out of the EU to jurisdictions where the requirements to access liquidity are less onerous.

- Clients who do remain within the EU could see the choice of methods to access markets reduced as DEA providers will likely be un-willing to underwrite the risk of reviewing and signing off 3rd party provided algos and preform extensive and detailed due diligence of clients trading operations, systems and controls. Where they are willing to do so the cost of compliance will mean that fees for clients would have to increase. For the majority of clients they will likely be forced to revert to more costly execution services such as electronic care orders and voice orders, where orders are executed via brokers desks manually.

- Due to the desire to protect intellectual property (i.e. algo source code) DEA clients may choose to become non-clearing members / Trade Participants (NCMs) of an exchange to avoid having to provide their algo source code to DEA providers. This means that NCMs then connect to the exchange directly with Sponsored Access. Currently GCMs (Clearing Members) who guarantee trades for NCMs / Trade Participants have fairly limited risk tools versus for these NCM clients. As such a broad move from DEA clients to access exchanges directly could potentially lead to increased as opposed to decreased risk.

- Higher costs of compliance for DEA providers will mean that increased economies of scale will be required to compete on a profitable basis (especially taking into account the increased cost of capital). There will likely be further consolidation in the number of providers of DEA access.

- Firms who are not members of exchanges but provide ‘white label’ access to their clients could be prohibited from offering this service as they would not be recognised as DEA providers as they are not members of exchanges. This could result in a lot less choice for clients on where they can obtain electronic access. Furthermore the smaller clients might find that they do not meet the client profiles required of the large firms and so would effectively be forced back to more expensive methods of trading such as voice.
Conclusions and Open Questions

• The focus should rightly be on the systems and controls of DEA providers who are the members of the exchanges - they are the ‘gatekeepers’ for exchange access.

• DEA providers manage these risks with a combination of pre and post-trade risk controls. Whilst due diligence on end DEA clients is performed it is on a principles basis and is proportional to the nature of the client’s activity and regulatory status. Greater consistency and standardisation across the industry on due diligence would be helpful for both DEA providers and DEA users. Perhaps an industry standard set of principles and standards could be developed by Trade Associations?

• Regulators should be mindful of the role that non-member DEA providers play in servicing lower tiers (in terms of capitalisation) of market participants. In the spirit of open access it is important that all levels of participants can continue to access markets electronically. Otherwise these participants could end up being penalised with few options for accessing liquidity (i.e. reversion to voice) and with much higher transaction costs.

• Further thought and clarity needs to be provided on whether different levels of controls should be allowed for (non-clearing members) NCMs / Trade Participants or whether the GCM (clearer) should have the same level of controls for this activity as their other DEA Clients (as the risks are the same).

• It is unclear from the current level 2 text if ESMA are looking for a mandatory ‘independent two-layer’ approach to risk i.e. risk controls at both the DEA provider and Venues [Ref page 223, point 59 and page 233 point 101]. It would be helpful if ESMA was more explicit with their intent. Today DEA providers are able to select the most appropriate internal and/or exchange controls to best fit their risk management needs for a particular client.

• In summary close dialogue and consultation will be required at a detailed technical level through the consultation process to ensure that regulatory objectives are met without unintended consequences.
Questions?
Appendix: Glossary / Key Definitions

- **Direct Electronic Access (DEA)** – the ability for a market participant to interact with the electronic trading venue directly without placing an order with an intermediary to work on their behalf. DEA includes Direct Market Access and Sponsored Access.

- **Direct Electronic Access (DEA) Provider** – an Investment Firm that provides electronic access to a trading venue for its clients; access can be provided through Direct Market Access or Sponsored Access to the venue.

- **Direct Market Access (DMA)** – a subset of DEA; the ability for a market participant to route orders electronically through the DEA Provider’s infrastructure to the trading venue.

- **Sponsored Access (SA)** – a subset of DEA; the ability for a market participant to route orders directly to the electronic trading venue without passing through the DEA Provider’s infrastructure.

- **Naked Sponsored Access** - This is prohibited in MiFID as it means that there are no risk controls inserted between the market participant and the trading venue by the DEA Provider.

- **White Label / Re-distribution** – Where an investment firm provides electronic access to their clients using the exchange connections and memberships of a DEA provider.

- **Trade Participant/ Non-Clearing Member (NCM)** – An investment firm that is a member of an exchange but does not have the ability to clear their own trades.

- **GCM/General Clearing Member** – The investment firm that clears trades and manages margin payments to the exchanges.
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