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Update on algorithmic trading in bond markets

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1.

How bond market algorithms differ from those developed for other markets

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How bond market algorithms differ from those developed for other markets

The design of market-making algorithms is dictated by the particular market structure of each asset class.

PRICE FORMATION

1 *Defining fair value*

FX	Data driven	• Aggregation of market data feeds across regions and venues • Where is the latest and most relevant information? • How fast can you ingest, digest and react to market changes?
EGBs	Model driven	• Utilize futures price and reference price (ie, TW composite) • How do you define relationships between correlated instruments?

2 *Building a price around the fair value mid*

FX	Low information environment	• Often trade on stream with limited pre-trade information • Send best possible price
EGBs	Complex information set	• Win the inquiry; then win the trade • Ability to build a price using historical data and RFQ-specific information

INVENTORY AND RISK MANAGEMENT

3 *Hedging instruments & hold times*

FX	Same-security hedging	• Hedge with the same instrument • Close position at will in the market • Short hold times
EGBs	More instrument fungibility	• Most risk is lower-order; hedge duration but left with spread, curve or basis risk • Holding periods are longer • No guarantee of finding a price in the same security

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2.

How algorithms can affect the market functioning and what could be done to mitigate those risks

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Impacts of algorithmic pricing on trading and execution behavior

Algorithmic pricing has many beneficial consequences for the liquidity landscape and buy-side execution, including benefits for voice trading

1	Market making desks are able to disseminate prices to a wide audience quickly and efficiently
2	Algorithmic execution incentivizes clients to break down trades into smaller clips, allowing for automated execution, limiting market impact and minimizing information leakage
3	More data available to both buy and sell side, enabling data-driven counterparty selection, pre and post-trade analysis
4	Algorithmic pricing and automated responses gives voice traders more capacity to allow for focus on complex situations or large risk transfer
5	Market makers are able to provide faster and more consistent responses to inquiries

Challenges introduced by increased algorithmic pricing

The impacts of a market structure evolution depend on the ways in which clients and market makers adapt to the changes

Challenges for market makers in an increasingly automated market making environment:

- Increasing reliance on technology and stability of ECNs/exchanges/venues
  - For connectivity to hedging sources
  - To perform real-time reconciliation of trades
  - Introduces need to monitor outages, connectivity, latency, limits
- A shift in execution methods will impact the type of pre-trade information exchanged
  - There is different information value in large block trades vs. smaller electronic clips
  - There is different information value for in-comp RFQs vs. trades on bilateral streams
  - The counterparties in a bilateral out-of-comp trade both benefit, with limited information leakage / market impact
- Necessitates a cultural shift on the trading floor
  - Different skill sets become very valuable
  - Flow sales must adapt to a changing method of execution and dealer measurement from their clients
- Client expectations for fast and consistent responses can be difficult to fulfill in volatile market conditions
  - In an increasingly electronic environment, the absence of automated pricing or electronic liquidity during periods of high volatility can be disruptive to a client’s regular workflow

Steps for risk mitigation

Algorithmic trading requires a focus on operational resiliency of the plant and strict controls

1	**Plant capacity**	Ensuring sufficient capacity for a material increase in volume, volatility or market failure
2	**Outage management**	Minimize risks that system failures prevent access to the markets; minimize duration of any incidents
3	**E-Trading governance**	Sufficient oversight and management to minimize operational risks, oversee client enablement processes, technology incident reviews, etc
4	**Algo governance**	Strategic governance framework to review new models or material changes to existing algorithms
5	**Risk controls**	Multi-layered overlapping controls designed to manage market impact, counterparty risk, market risk, low latency controls / kill switches

Algorithmic market makers must strike a balance between protecting the book from risk events while also consistently providing prices to clients

Possible impact on bond market functioning

- **"Flash crashes" have historically occurred in substantially electronic markets where there is a temporary supply/demand imbalance in thin liquidity conditions, and mechanical rules-based strategies are triggered**
- **In the European bond markets, a significant move in Futures prices would be a catalyst for algorithmic pricing to be temporarily turned off or widened**
  - Market makers would have difficulty hedging if there is volatility or lack of liquidity in the futures market
  - However, liquidity would still be available to clients, albeit with more conservative and likely manual pricing

There is an effective Volatility Interruption mechanism on Eurex (ie, a circuit breaker)

Algorithmic pricing might be turned off in volatile conditions, but a bond market "crash" would be less likely given the current D2D trading activity

Unlike FX, the market closes – very thin liquidity conditions in hedging instruments are less likely to occur

While turning off algorithmic pricing in periods of market stress could temporarily disrupt the EGB market, the biggest impact is to the client experience.