

MiFID II

**Algorithmic and high-frequency trading for
investment firms**

December 2016

**Hogan
Lovells**

Key Points

- MiFID II introduces closer regulation of algorithmic and high-frequency trading.
- Algorithmic traders engaging in market making activity will be subject to specific requirements under MiFID II.
- Firms providing direct electronic access must have effective systems and controls.
- Firms that are involved in algorithmic trading must issue a notification to their national regulators.
- General clearing members will be subject to systems and controls requirements, and will be required to have in place a written agreement with trading venues.

This note contains matters relating to the impact of MiFID II on investment firms that engage in algorithmic and high-frequency trading. For the impact of MiFID II on trading venues that permit algorithmic and high-frequency trading on their systems, please see our separate briefing note on the Market Infrastructure and Trading Venues.

Definitions and scope

MiFID II introduces the concept of algorithmic trading and, as a subset of that, high frequency algorithmic trading ("**HFT**"). MiFID II seeks to ensure that all HFT trading firms are authorised as investment firms.

Algorithmic Trading

Algorithmic trading is defined in the MiFID II Directive as:

"trading in financial instruments where a computer algorithm automatically determines individual parameters of orders such as whether to initiate the order, the timing, price or quantity of the order or how to manage the order after its submission, with limited or no human intervention, and does not include any system that is only used for the purpose of routing orders to one or more trading venues or for the

*processing of orders involving no determination of any trading parameters or for the confirmation of orders or the post-trade processing of executed transactions)."*¹

The Commission has adopted the MiFID II Delegated Regulation which provides further detail on the definition of algorithmic trading.² This is based on ESMA's earlier Technical Advice to the Commission.³

- The MiFID II Delegated Regulation states that a system shall be considered as having "no or limited human intervention" (which is indicative of algorithmic trading) where, for any order or quote generation process or any process to optimise order-execution, an automated system makes decisions at any of the stages of initiating, generating, routing or executing orders or quotes according to pre-determined parameters.⁴
- Algorithmic trading should refer not only to the automatic generation of orders but also to the optimisation of order-execution processes by automated means.⁵
- The recitals to the Delegated Regulation make clear that algorithmic trading would include smart order routers ("**SORs**") where such devices use algorithms for optimisation of order execution processes that determine parameters of the order other than the venue or venues where the order should be submitted.
- In contrast, algorithmic trading would not cover automated order routers ("**AORs**")

¹ Article 4(1)(39), MiFID II Directive.

² Commission Delegated Regulation (EU) of 25 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council as regards organisational requirements and operating conditions for investment firms and defined terms for the purposes of that Directive (the "**MiFID II Delegated Regulation**").

³ ESMA, Final Report: Technical Advice to the Commission on MiFID II and MiFIR, 19 December 2014 (ESMA/2014/1569) (the "**Technical Advice**"), Chapter 5.1, p. 338.

⁴ Article 18, MiFID II Delegated Regulation.

⁵ Recital 21, MiFID II Delegated Regulation.

where, although using algorithms, such devices only determine the trading venue or venues where the order should be submitted without changing any other parameter of the order.

HFT

HFT is defined in the MiFID II Directive. According to the Directive, a "high-frequency algorithmic trading technique" is a form of algorithmic trading where a trading system analysis data from the market at high speed and then sends or updates large numbers of orders within a short time frame as a result of that analysis. Under the MiFID II definition it is characterised by:

- infrastructure intended to minimise network and other types of latencies, including at least one of the following facilities for algorithmic order entry: co-location, proximity hosting or high-speed direct electronic access;
- system-determination of order initiation, generation, routing or execution without human intervention for individual trades or orders; and
- "high message intraday rates" which constitute orders, quotes or cancellations.⁶

Under MiFID I, persons engaging in algorithmic trading on their own account could take advantage of exemptions for persons dealing on own account.⁷ However, MiFID II will remove the availability of this exemption where a person engages in HFT techniques. The consequence of this is that, unless another exemption applies, the HFT trader will need to become authorised.⁸

For the purposes of distinguishing HFT, the MiFID II Delegated Regulation recommends various measures for the identification of "high message

intra-day rates".⁹ The Delegated Regulation makes clear that a "high message intraday rate" for these purposes shall consist of submission, on average, of:

- at least 4 messages per second with respect to all instruments across a venue; or
- at least 2 messages per second traded with respect to any single instrument traded on a venue.

Messages shall only be counted for these purposes when they relate to proprietary dealing (that is, dealing on own account) in liquid financial instruments. Messages introduced for the purposes of market-making will also fall within this calculation. Messages introduced for the purposes of receiving and transmitting orders or executing orders of behalf of clients will not form part of this calculation. There is, however, an anti-avoidance rule which means that if a firm adopts a different trading structure (such as trading between group companies) to avoid the trading falling within scope, such trading will still be caught.

Where a firm is also a provider of direct electronic access (see below), messages sent by the firm's direct electronic access clients will not be included within the calculations for that firm.

Trading venues must make available to the firms concerned, on request, estimates of the average of messages per second on a monthly basis two weeks after the end of each calendar month taking into account all messages submitted during the preceding 12 months.

The Commission has adopted a regulatory technical standard ("**RTS**"), RTS 6, and its Annex, which contain requirements on the content and format of order records for HFT trades.¹⁰

⁶ Article 4(1)(40), MiFID II Directive.

⁷ Article 2(1)(d), MiFID I Directive.

⁸ Article 2(1)(d)(iii), MiFID II Directive.

⁹ Article 19, MiFID II Delegated Regulation.
¹⁰ Commission Delegated Regulation (EU) of 19 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying the organisational requirements of investment firms engaged in algorithmic trading ("**RTS 6**").

Systems and controls requirements

Under MiFID II, firms engaging in algorithmic trading must have in place effective and resilient systems, as well as appropriate risk controls. Firms must ensure these systems are tested, and that they have in place business continuity arrangements. There must be appropriate order limits to prevent erroneous orders and orders that could create a disorderly market from being entered.¹¹

Under MiFID II, firms must also have controls in place which automatically cancel any orders that the relevant trader is not permitted to make or that exceed the firm's risk thresholds. Firms must also monitor their systems and have in place procedures to identify those algorithms that could cause a disorderly market. As part of this, the firm must have the capacity to cancel all outstanding orders at all trading venues (the "kill switch").

Requirements applicable to algorithmic trading systems

The systems and controls requirements are contained in RTS 6:¹²

- Firms must develop methodologies to develop and test algorithms, systems and strategies.
- Firms must undertake conformance testing. This is testing to ensure that the algorithmic trading systems used operate correctly and in accordance with requirements of other relevant systems such as the systems of a trading venue or any direct market access systems.
- Some of the testing must be done within a separate testing environment.
- Prior to deploying algorithms, firms must set pre-defined limits on algorithms such as limits relating to the number of financial instruments traded, the price and order

quantity, trading strategies and the number of trading venues orders are sent to.

- Firms must annually self-assess and validate algorithms and associated systems. This includes assessing its business continuity arrangements.
- As part of the annual self-assessment, a firm must stress test its algorithms to check if they can withstand increased order flows and other market stresses.
- Any material changes to the production environment of an algorithm must be approved by a person designated by senior management.
- A firm must have a "kill function" which would allow it to cancel immediately any or all of its unexecuted orders submitted to all trading venues to which that firm is connected.
- Firms must maintain an automated system to monitor trading activity and detect market manipulation.
- A firm is required to have business continuity arrangements.
- A firm is required to have pre-trade controls (i.e. controls that should operate before an instruction is submitted to a trading venue), such as automatic execution throttles that prevent trading being undertaken in line with a particular investment strategy more than a certain number of times.
- There are requirements relating to the monitoring of trading activity with real-time alerts identifying signs of disorderly trading or breaches of pre-trade limits.
- There are also requirements for a firm to operate post-trade controls. These would involve monitoring the firm's exposures

¹¹ Article 17(1), MiFID II Directive.
¹² Articles 5-18, RTS 6.

and taking required steps such as shutting down algorithms where required.

- A firm must have arrangements for physical and IT security.

Organisational arrangements

Organisational requirements for firms engaged in algorithmic trading are also contained in RTS 6:¹³

- There are general requirements on governance arrangements including requirements to have lines of accountability, and segregation between trading desks and supporting functions to ensure that unauthorised trading cannot be concealed.
- There are also requirements around the role of the compliance function, including, in particular that the function should either have direct access to the "kill function" or access at all times to the persons who have access to the "kill function".
- There are rules relating to staff and the requirements that staff should have sufficient knowledge of algorithmic trading systems.
- Where a firm outsources or procures software linked to algorithmic trading, it remains wholly responsible for complying with these requirements and must have knowledge and documentation to ensure effective compliance.

Market making strategy

MiFID II imposes obligations on algorithmic traders when they pursue a market making strategy. A person engaged in algorithmic trading will be considered to pursue a market making strategy when its strategy (when dealing on its own account) involves the firm, simultaneous posting

of two-way quotes of comparable size and at competitive prices relating to one or more financial instruments on a regular and frequent basis.¹⁴

A person pursuing such a strategy must:

- (a) except under exceptional circumstances, carry out this market making continuously during a specified proportion of the trading venue's trading hours;
- (b) enter into a binding written agreement with the trading venue specifying its market making obligations; and
- (c) have in place systems and controls to ensure its compliance with the agreement in (b).¹⁵

RTS 8 sets out further requirements in relation to market making. It details:

- the obligation on firms to enter into a market making agreement and when this would be triggered, and the required terms of such agreement; and
- the "exceptional circumstances" in which a market making firm is not required to provide liquidity (market make) on a continual basis, and guidance on the identification of such circumstances (these include, for example, war and disorderly trading conditions).¹⁶

Direct electronic access

MiFID II seeks to ban the provision of direct electronic access to markets by investment firms for their clients where such access is not subject to proper systems and controls.¹⁷

¹⁴ Article 17(4), MiFID II Directive.

¹⁵ Article 17(3), MiFID II Directive.

¹⁶ Articles 1-4, Commission Delegated Regulation (EU) of 13 June 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards specifying the requirements on market making agreements and schemes ("RTS 8"). For an earlier draft of RTS 8, see ESMA, Regulatory technical and implementing standards: Annex I, MiFID II/MiFIR, 28 September 2015; and ESMA, Final Report, 28 September 2015.

¹⁷ Article 17(5), MiFID II Directive.

¹³ Articles 1-4, RTS 6.

Under MiFID II, direct electronic access means:

*"an arrangement where a member or participant or client of a trading venue permits a person to use its trading code so the person can electronically transmit orders relating to a financial instrument directly to the trading venue and includes arrangements which involve the use by a person of the infrastructure of the member or participant or client, or any connecting system provided by the member or participant or client, to transmit the orders (direct market access) and arrangements where such an infrastructure is not used by a person (sponsored access)."*¹⁸

Under such arrangements, clients are permitted to enter orders on an intermediary's internal electronic system, which then automatically places an order on a trading platform using the intermediary's ID or the intermediary allows clients to transmit orders electronically and directly to the trading platform using the intermediary's ID without being routed through the intermediary's internal electronic systems.

The own account dealing exemption is removed for persons who have direct electronic access.¹⁹

The MiFID II Delegated Regulation contains provisions on the scope of direct electronic access. In summary:

- Article 20(1) of the Delegated Regulation states that if a person cannot exercise discretion regarding the exact fraction of a second of order entry and the lifetime of the order within that timeframe, then the person will not be viewed as having direct electronic access.

For example, arrangements that allow clients to transmit orders to an investment firm in an electronic format, such as online brokerage, should not be considered direct electronic access provided that clients do not have the ability to determine the

fraction of a second of order entry and the life time of orders within that time frame.

- Article 20(2) states that a person will not have direct electronic access where the order transmission takes place through arrangements for optimisation of order execution processes that determine the parameters of the order (other than the venue where the order should be submitted), unless these arrangements are embedded into the clients' systems.

This includes SOR, which is a kind of algorithm concerned with the optimisation of the order execution process, rather than where the order should be executed. For example, the algorithm may split a large order into smaller orders. Where the client of a member/participant of a trading venue submits an order via a SOR, this may involve direct electronic access if the SOR is embedded into the clients' infrastructure. However, if the SOR is embedded into the member firm's infrastructure this should not involve direct electronic access.

The ESMA Technical Advice contained guidance on AOR. This is a system used by an intermediary to allow a client to place an order on the market under the client's ID. The use of the ID allows the intermediary to monitor and stop any trades if necessary. AOR does not necessarily fall in or out of the definition of direct electronic access however, if the client does not have discretion as to how the order is executed, it will not come within the definition of direct electronic access.²⁰

The MiFID II Delegated Regulation makes clear that the trading of a person having direct electronic access may also fall under the definitions of algorithmic trading and/or high frequency algorithmic trading.²¹

¹⁸ Article 4(1)(41), MiFID II Directive.
¹⁹ Article 2(1)(d)(iii), MiFID II Directive.

²⁰ ESMA, Technical Advice, Chapter 5.2, pp. 343-4.
²¹ Recital 21 of the Delegated Regulation of 25 April 2016.

The new MiFID II system and controls requirements for providers of direct electronic access are as follows:

- a proper assessment of the suitability of all users;
- pre-set trading and credit thresholds;
- pre-trade controls in place to allow the automatic cancellation of a trade, where there is a risk that a trade could contribute to a disorderly market; and
- monitoring of client's trading activity on a real time basis to allow the trading venue to adapt such pre-trade controls where necessary.²²

RTS 6 includes requirements in respect of systems and controls and particularly, due diligence of direct electronic access clients, on-going review of direct electronic access clients, and pre- and post-trade controls.²³

- A requirement to ensure that the trading of a firm's direct access clients complies with trading venue rules (Article 19).
- A person providing sponsored access must have equivalent controls in relation to sponsored access users (Article 20).
- Unique identification numbers are assigned to all users of direct electronic access (Article 21), to allow a firm to identify a user, and subsequently suspend or terminate the user's direct electronic access where there is a risk of disorderly trading.
- Requirements regarding the structure of a firm's direct electronic access systems, including that it must be possible to

automatically block or cancel orders placed in various circumstances (Article 21).

- Requirements to carry out due diligence on direct electronic access clients (Article 22), and review such due diligence annually (Article 23).

There are also requirements to impose various systems and controls requirements applicable to algorithmic trading (Article 20). In particular:

- Firms must maintain an automated system to monitor trading activity and detect market manipulation (Article 13).
- A firm is required to have pre-trade controls (i.e. controls that should operate before an instruction is submitted to a trading venue), such as automatic execution throttles that prevent trading being undertaken in line with a particular investment strategy more than a certain number of times (Article 15).
- There are also requirements for a firm to operate post-trade controls. These would involve monitoring the firm's exposures and taking required steps such as shutting down algorithms where required (Article 17).
- There are requirements relating to the monitoring of trading activity with real-time alerts identifying signs of disorderly trading or breaches of pre-trade limits (Article 16).

Member state notification

A firm engaging in algorithmic trading must notify its national competent authority ("NCA") (that is, the relevant regulator in that member state). It must keep records of all key compliance and risk controls it has in place, along with its algorithmic trading strategies and any relevant limits. It must

²² Article 17(5), MiFID II Directive; and RTS 13 in ESMA, Consultation Paper, 19 December 2014.

²³ For an earlier draft of this RTS, see RTS 6 in ESMA, Regulatory technical and implementing standards: Annex I, MiFID II/MiFIR, 28 September 2015.

provide such information and records to its NCA on request.²⁴

A person providing direct electronic access must notify its NCA, and where applicable notify its trading venue. It must keep records all key compliance and risk controls it has in place and provide such information and records to its NCA on request.²⁵

General clearing members

A firm that acts as a general clearing member must:

- enter into a written agreement with the trading venue which specifies its market making obligations; and
- have in place systems and controls to ensure its services are only applied to suitable persons.²⁶

RTS 6 contains a range of requirements applicable to general clearing members.²⁷ In particular:

- Firms' systems must be subject to due diligence assessments, monitoring and controls (Article 24).
- Firms are required to perform due diligence on their clients (Article 25).
- Firms are required to set out and communicate position limits to their clients, and monitor their clients' positions in relation to such limits (Article 26).
- Firms must provide the terms on which they provide clearing services, and these must be reasonable commercial terms (Article 27).

Timescales for implementation

The MiFID II Directive and MiFIR came into force on 3 July 2014, and most of their provisions will come into effect in member states from 3 January 2018. Member states have until July 2017 to transpose the MiFID II Directive into national law.²⁸

The MiFID II Delegated Regulation and the RTS will become effective from 3 January 2018. The MiFID II Delegated Regulation and RTS will have direct effect and the member states will not need to implement this legislation into national law.

²⁴ Article 17(2), MiFID II Directive.

²⁵ Article 17(5), MiFID II Directive.

²⁶ Article 17(6), MiFID II Directive.

²⁷ For an earlier draft, see RTS 6 in ESMA, Regulatory technical and implementing standards: Annex I, MiFID II/MiFIR, 28 September 2015.

²⁸ See Directive (EU) 2016/1034 of the European Parliament and of the Council of 23 June 2016 amending Directive 2014/65/EU on markets in financial instruments.

Alicante
Amsterdam
Baltimore
Beijing
Brussels
Budapest
Caracas
Colorado Springs
Denver
Dubai
Dusseldorf
Frankfurt
Hamburg
Hanoi
Ho Chi Minh City
Hong Kong
Houston
Jakarta
Johannesburg
London
Los Angeles
Louisville
Luxembourg
Madrid
Mexico City
Miami
Milan
Minneapolis
Monterrey
Moscow
Munich
New York
Northern Virginia
Paris
Perth
Philadelphia
Rio de Janeiro
Rome
San Francisco
São Paulo
Shanghai
Shanghai FTZ
Silicon Valley
Singapore
Sydney
Tokyo
Ulaanbaatar
Warsaw
Washington, D.C.
Zagreb

Our offices

Associated offices

www.hoganlovells.com

"Hogan Lovells" or the "firm" is an international legal practice that includes Hogan Lovells International LLP, Hogan Lovells US LLP and their affiliated businesses.

The word "partner" is used to describe a partner or member of Hogan Lovells International LLP, Hogan Lovells US LLP or any of their affiliated entities or any employee or consultant with equivalent standing. Certain individuals, who are designated as partners, but who are not members of Hogan Lovells International LLP, do not hold qualifications equivalent to members.

For more information about Hogan Lovells, the partners and their qualifications, see www.hoganlovells.com.

Where case studies are included, results achieved do not guarantee similar outcomes for other clients. Attorney advertising. Images of people may feature current or former lawyers and employees at Hogan Lovells or models not connected with the firm.

©Hogan Lovells 2016. All rights reserved.4342208