

Algorithms put to the test:

Control of algorithms in securities trading through mandatory market simulations?

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Relevance?



Consultation Paper

MiFID II/MiFIR review report on Algorithmic Trading

“The testing of algorithms is paramount to the efficiency of markets.” (para. 155)

18 December 2020 | ESMA70-156-2368



Final Report

Guidelines on certain aspects of the MiFID II suitability requirements

“In order to ensure the consistency of the suitability assessment conducted through automated tools [...], firms should regularly monitor and test the algorithms”. (para. 82)

28 May 2018 | ESMA35-43-869

Content

Control of algorithms?

... from a legal perspective = overview of algo

testing framework

- Testing objectives
- Testing environments
- Testing procedures
- Certification of testing
- Role of the supervisory authorities

... from a regulatory perspective

- Appropriateness of self-regulation?
- Effectiveness of market simulations?
- Testing of “Artificial intelligence”?

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Legal basis of algo testing

	Investment Firms	Trading Venues
Level 1	<p>Art 17(1) MiFID II</p> <p>A trading participant <i>“that engages in algorithmic trading [...] shall ensure its systems are fully tested [...]”</i></p>	<p>Art 48(6) MiFID II</p> <p>Trading venues have to require their trading participants <i>“to carry out appropriate testing of algorithms and providing environments to facilitate such testing [...]”</i></p>
Level 2	<p>CDR (EU) 2017/589</p> <ul style="list-style-type: none">Art 5 – ‘General methodology’Art 6 – ‘Conformance testing’Art 7 – ‘Testing environments’	<p>CDR (EU) 2017/584</p> <ul style="list-style-type: none">Art 9 – ‘Conformance testing’Art 10 – ‘Testing the members' algorithms to avoid disorderly trading conditions’

“behavioural testing” of algorithms (ESMA)

Testing framework I

- “Test objectives” => Main criteria to be tested according to CDR (EU) 2017/589 are that an algorithm does ...
 - “not behave in an *unintended manner*” &
 - “not contribute to *disorderly trading conditions*” + “work effectively in *stressed market conditions*” (incl. switching off the trading algorithm)¹
- ⇒ What does “unintended manner” or “disorderly trading conditions” mean?
- + taking into account impact on the “*overall fair and orderly functioning of the market*”²
- ⇒ Interplay between MiFID II and Market Abuse Regulation unclear (cf. TraderServe 2016)

¹ Cf Art 7(1) in connection with Art 5(4) CDR (EU) 2017/589

² Recital (6) CDR (EU) 2017/589

Testing framework II

- **Testing environment?**
 - internal or external, provided by any third party (TV, vendor etc)¹
 - strictly simulated, “non-live” testing environments

 - **“Testing procedures”?**
 - explicitly only with regard to trading venues => by means of “simulation facilities” or “testing symbols”²
 - No testing methods or scenarios ... Testing just with “historical data” sufficient? (e.g. Fett 2020)
- ⇒ In any case, evaluation of the testing outcome by trading participants themselves!

¹ Art 7(2) CDR (EU) 2017/589

² Cf Art 10(2) CDR (EU) 2017/584

Testing framework III

- **Algo-test certification**
 - Trading participants must be required by the trading venue “to certify” that algos have been tested + “explain the means used for that testing”.¹
 - However, TVs are not obliged “to validate the adequacy of those means or the outcome of that testing”²
 - Only a “self-certification” by trading participants
- **Role of the supervisory authorities?**
 - Algo-Tests are not a supervisory measure, but NCAs have extensive investigatory powers (also) in relation to tests (Art 17(2) MiFID II)
 - More “law in the books” so far (according to ESMA CP)

¹ Art 10(1) CDR (EU) 2017/584

² Recital (13) CDR (EU) 2017/584

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Regulatory Policy I

(1) Appropriateness of self-regulation?

- Reliance on (self-)testing and self-certification
 - questionable in light of “opaque risk models” & GFC (cf. Allen 2020)
 - exacerbated by vague test objectives and procedures
 - From a regulatory perspective, tendency towards a differentiated approach
- ⇒ e.g. Proposal for *Digital Operational Resilience Act (DORA)*: “*Financial entities shall ensure that tests are undertaken by **independent parties**, whether internal or external.*”¹

¹ Art 21(4) DORA-Proposal

Regulatory Policy II

(2) Overall effectiveness of test?

- Quite criticized in literature and already in the legislative process
- Main argument: Testing cannot reproduce real interactions of algos with the market
- ⇒ While financial regulation still largely “atomistic”, trend towards “network-sensitive financial rules” (cf. Enriques et al. 2020)
- ⇒ Similarly, effective algo testing must focus on the interaction of an algorithm (cf. to some extent also ESMA CP)
- Art 48(6) MiFID II: not only prevent “creation” of disorderly trading conditions, but also “contribution” to such conditions!
- ⇒ Need for “network-sensitive simulations”

Conclusion

1. Crucial elements for the “control” of algorithms (esp. testing objectives and procedures) are vague
2. Due to reliance on self-regulation, clearer rules regarding (self-)testing and/or “testers” seem desirable
3. Effective testing needs to take into account interactions of algos

Thank you
for your attention



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