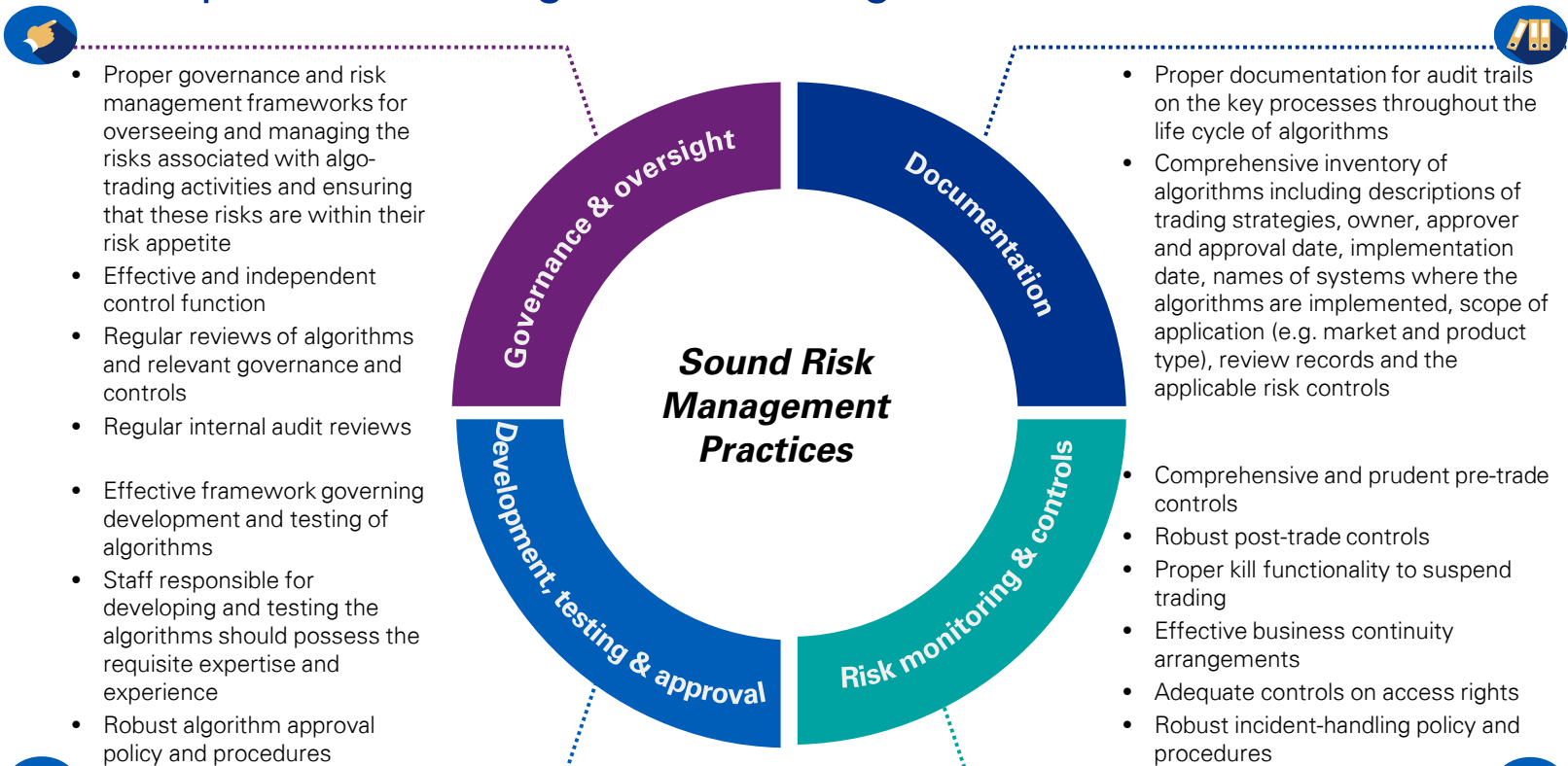# Regulatory Expectations for Algorithmic Trading

Sound risk management practices for algorithmic trading issued by the HKMA
July 2020

The HKMA undertook a round of thematic examinations focused on algorithmic trading (algo-trading) in 2019[1]. Seven Authorized Institutions (AIs), mainly international banks using algorithms for making investment decisions, were covered in the thematic examinations. The objective of the examinations was to assess the adequacy and effectiveness of AIs' risk management practices relating to algo-trading activities, including governance and oversight, development and testing of algorithms, and risk monitoring and controls.

The scope of the algo-trading activities covered by the HKMA circular is broader than the SFC Code of Conduct requirements on algo-trading. The HKMA circular covers activities which are not regulated by the Securities and Futures Ordinance ("SFO") including foreign exchange trading. Broadly speaking, the areas of focus for the HKMA and SFC are the same, although the HKMA has communicated more prescriptive expectations in a number of areas.

HKMA Expectations for Algorithmic Trading Activities

Governance & oversight

- Proper governance and risk management frameworks for overseeing and managing the risks associated with algo-trading activities and ensuring that these risks are within their risk appetite
- Effective and independent control function
- Regular reviews of algorithms and relevant governance and controls
- Regular internal audit reviews

Development, testing & approval

- Effective framework governing development and testing of algorithms
- Staff responsible for developing and testing the algorithms should possess the requisite expertise and experience
- Robust algorithm approval policy and procedures

Documentation

- Proper documentation for audit trails on the key processes throughout the life cycle of algorithms
- Comprehensive inventory of algorithms including descriptions of trading strategies, owner, approver and approval date, implementation date, names of systems where the algorithms are implemented, scope of application (e.g. market and product type), review records and the applicable risk controls

Risk monitoring & controls

- Comprehensive and prudent pre-trade controls
- Robust post-trade controls
- Proper kill functionality to suspend trading
- Effective business continuity arrangements
- Adequate controls on access rights
- Robust incident-handling policy and procedures

[1]HKMA Circular on Sound risk management practices for algorithmic trading (6 March 2020) (https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2020/20200306e1a1.pdf)

Comparing the HKMA and SFC requirements

The following outlines a comparison between the HKMA and SFC requirements on algorithmic trading:

	HKMA	SFC
Requirements	• HKMA Circular on Sound risk management practices for algorithmic trading (6 March 2020)	• Code of Conduct for persons licensed by or registered with the SFC: Sections 18.9 to 18.11; Schedule 7(3): Specific Requirements on Algorithmic Trading • SFC Circular to all Licensed Corporations on Algorithmic Trading (13 December 2016)
Scope	• Authorized Institutions ("AIs") conducting algorithmic trading • Applies to all AIs including those which are not Registered Institutions and hence are not subject to the SFC Code of Conduct Requirements • Scope includes activities which are not regulated by the Securities and Futures Ordinance including foreign-exchange trading	• A licensed or registered person which uses internally developed algorithmic trading system or trading algorithms, or provides its algorithmic trading system or trading algorithms for use by its clients • The requirements apply to algorithmic trading of securities and futures contracts that are listed or traded on an exchange
Areas of focus	• **Governance and oversight** including risk management framework and effective independent control function • **Development, testing and approval** to ensure that new algorithms or changes to the algorithms currently in use are subject to proper testing, reviews and challenges before they are implemented • **Risk monitoring and controls** including comprehensive pre-trade and post-trade controls • **Documentation** of audit trails and comprehensive inventory of algorithms	• **Qualifications** of persons involved in the design and development or, or approved to use, the algorithmic trading system and trading algorithms • **Testing** of the algorithmic trading system and trading algorithms used or provided to clients for use to ensure they operate as designed • **Controls** to ensure the integrity of the algorithmic trading system and trading algorithms and to ensure they operate in the interest of the integrity of the market • **Documentation** of the design and development, including any modifications, of the algorithmic trading system and trading algorithms
Key differences	The HKMA expectations are **more prescriptive** than the SFC requirements in a number of areas including expectations for: • Sufficient local representation in algo-trading bodies at the group level; • Control function should have system access to activate kill switch; • Algos should be reviewed by 1st and 2nd lines of defence at least annually with results reported to head office; • Granular pre-trade controls with controls limit varied by client and strategy and regular review to take into account market conditions; • Regular review of circuit breaker triggers; • Controls over access rights to algo-trading systems at different stages of life cycle of algorithms, including development, testing, migration from testing to the production environment and implementation; • Robust incident handling policy and procedures; and • Comprehensive inventories on algorithms implemented as well as a separate inventory of applicable risk controls to facilitate identification of inconsistent risk controls across the implemented algorithms.	

How can KPMG help?

We have extensive experience in supporting our clients in their journey to compliance with regulatory requirements in relation to algo-trading, helping them to reduce exposure to risk and enhance algo-trading controls. We have subject matter experts in algo-trading review and can bring market insights on regulatory expectations.

01

Governance & oversight
- ✓ Develop the three lines of defence framework
- ✓ Advise on management accountability
- ✓ Delineate terms of reference
- ✓ Define roles and responsibilities
- ✓ Design management reporting and escalation framework

02

Development, testing & approval
- ✓ Review change management procedures including design of UAT test cases, conduct of regression testing, and system integration testing
- ✓ Assign experienced PMO to oversee the entire development and testing processes to ensure that the processes are well coordinated and performed in a consistent manner across different algorithms
- ✓ Design standardised approval templates and procedures relating to the deployment of algorithms
- ✓ Perform algorithms testing as a managed service

03

Risk monitoring & controls
- ✓ Assess risks and controls arising from algo-trading activities
- ✓ Perform gap analysis against industry practice on pre-trade and post-trade controls
- ✓ Evaluate design and operating effectiveness of control relating to algo-trading, including kill switch functionality, triggers for circuit breaker and access controls
- ✓ Conduct testing to assess the effectiveness of business continuity plan
- ✓ Perform lookback review and root cause analysis on incidents relating to algo-trading

04

Documentation
- ✓ Establish and document a comprehensive inventory of all the algorithms implemented
- ✓ Identify supporting evidence and audit trails relating to algo-trading
- ✓ Develop documentation standards and templates used for the key processes throughout the life cycle of algorithms

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